REQUEST/APPROVAL PAGE

# SAFETY RELATED PROCEDURE

**Normal Review Class** (check one):
☒ **OSRC**
☐ **QUALIFIED REVIEW**

| | | | |
|---|---|---|---|
| PROCEDURE NUMBER: | UNT-005-014 | REVISION: | 306 |

TITLE: Offsite Dose Calculation Manual

PROCEDURE OWNER (Position Title): Chemistry Manager

**TERM** (check one): ☒ **PERMANENT** ☐ **TEMPORARY**

Effective Date / Milestone (if applicable): 03.12.2015

Expiration Date / Milestone (if applicable): n/a

PROCEDURE ACTION (check one):

☒ Revision ☐ Deletion ☐ New Procedure

**DESCRIPTION AND JUSTIFICATION:**

Changed Chemistry Superintendent to Chemistry Manager in Responsibilities section.

Added references Certificate of Compliance, T.S. 5.4 and 10CFR Part 72.

Clarified section 5.8 to differentiate the requirements for the Effluent Release Report required by T.S. 6.9.1.8 and the Effluent Release Report for the ISFSI required by 10CFR72.44 in accordance with CR-WF3-2015-00242.

This revisions scope, intended results, non conservative changes and manner of operation have not been affected. Changes are made to match technical specifications and minor editorial corrections. Attachment 7.9 of W2.109 has been satisfied to meet editorial correction classification.

☐ Request/Approval Page Continuation Sheet(s) attached.

REVIEW PROCESS (check one): ☐ Normal ☒ Editorial Correction (Revisions only) ☐ Technical Verification (Revisions only)

| REVIEW AND APPROVAL ACTIVITIES | | | | PRINT NAME OR SIGNATURE | DATE |
|---|---|---|---|---|---|
| PREPARER | | | | Danielle Breaud | 3/9/15 |
| EC SUPERVISOR | Administrative Review and Approval | | | (sign) Nicole K. [illegible] | 3/12/15 |
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| GM, PLANT OPERATIONS | Review ☐ | Approval ☐ | | (sign) n/a | |
| VICE PRESIDENT, OPERATIONS | | Approval ☐ | | (sign) n/a | |

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INFORMATIONAL USE

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INFORMATIONAL USE

## 1.0 PURPOSE

1.1 The Offsite Dose Calculation Manual (ODCM) is a supporting document of the Waterford 3 Technical Specifications. The ODCM provides:

(1) The Radiological Effluent Specifications and Radiological Environmental Monitoring Program required by Technical Specification 6.8.4
(2) The detailed Radiological Environmental Monitoring Program (REMP)
(3) The description of the Radiological Environmental Monitoring Interlaboratory Comparison Program
(4) The liquid and gaseous radwaste block flow diagram
(5) The Radioactive Liquid and Gaseous Waste Sampling and Analysis Programs
(6) The general methodology to be used to calculate dose to individuals due to releases of radioactive gaseous and liquid effluents from the Waterford 3 site
(7) The general methodology to be used to calculate effluent monitor setpoints and allowable release rates to ensure compliance with the Radiological Effluent Controls, 10CFR20, and 10CFR50 criteria
(8) The methodology to be used to ensure representative sampling of liquids
(9) The methodology to be used to comply with 40CFR190 criteria
(10) The methodology to be used to comply with 72.104 criteria

## 2.0 REFERENCES

2.1 EN-LI-102, Corrective Action Process

2.2 UNT-006-010, Event Notification and Reporting

2.3 Waterford 3 FSAR Chapter 2

2.4 Waterford 3 Technical Requirements Manual (TRM)

2.5 Waterford 3 Technical Specifications (T.S.)

2.5.1 T.S. 3/4.11.1.4, Liquid Holdup Tanks

2.5.2 T.S. 3/4.11.2.6, Gas Storage Tanks

2.5.3 T.S. 5.1.3, Map Defining Unrestricted Areas for Radioactive Gaseous and Liquid Effluents

2.5.4 T.S. 6.9.1.7, Annual Radiological Environmental Operating Report

2.5.5 T.S. 6.9.1.8, Annual Radioactive Effluent Release Report

2.5.6 T.S. 6.9.2, Special Reports

2.5.7 T.S. 6.13, Process Control Program

2.5.8 T.S. 6.14, Offsite Dose Calculation Manual

2.5.9 T.S.6.8.4.f, Radioactive Effluent Control Program

2.5.10 Certificate of Compliance TS 5.4, Radiactive Effluent Control Program

2.6 Code of Federal Regulations: Title 10, Parts 20, 40, 50, 72 and 100; Title 40, Part 190 and 302

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2.7 HASL-300, HASL Procedures Manual; Currie, L.A., "Limits for Qualitative

Detection and Quantitative Determination Application to Radiochemistry", Anal Chem. 40, 586-93, (1968)

2.8 International Atomic Energy Agency (IAEA) Safety Series No.57, Generic Models and Parameters for Assessing the Environmental Transfer of Radionuclides from Routine Releases, Exposures of Critical Groups

2.9 NUREG/CR-1276, Users Manual for LADTAP II – A computer program for calculating radiation exposure to man from routine release of nuclear reactor liquid effluents

2.10 NUREG/CR-4007, Currie, L.A., "Lower Limit of Detection; Definition and Elaboration of a Proposed Position for Radiological Effluent and Environmental Measurements", (September 1984)

2.11 NUREG-0172, Age Specific Radiation Dose Commitment Factors for a One Year Chronic Intake

2.12 NUREG-1301, Offsite Dose Calculation Manual Guidance: Standard Radiological Effluent Controls for Pressurized Water Reactors, Generic Letter 89-01, Supplement No. 1. (November 1990)

2.13 Radiological Health Handbook, U.S. Department of Health, Education and Welfare, January 1970

2.14 USNRC Generic Letter 89-01, Implementation of Programmatic Controls for Radiological Effluent Technical Specifications in the Administrative Controls Section of the Technical Specifications and the Relocation of Procedural Details of RETS to the Offsite Dose Calculation Manual or to the Process Control Program

2.15 USNRC NUREG 0133, Preparation of Radiological Effluent Technical Specifications for Nuclear Power Plants, October 1978

2.16 USNRC Regulatory Guide 1.21, Measuring, Evaluating, and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water-Cooled Nuclear Power Plants, Revision 1, June, 1974

2.17 USNRC Regulatory Guide 1.109, Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10CFR Part 50, Appendix I, Revision 1, October, 1977

2.18 USNRC Regulatory Guide 1.111, Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Gaseous-Effluents from Light-Water-Cooled Reactors, July 1977

2.19 USNRC Regulatory Guide 1.113, Estimating Aquatic Dispersion of Effluents from Accidental and Routine Reactor Releases for the Purpose of Implementing Appendix I, April 1977

2.20 USNRC 72.104, Criteria for Radioactive Materials in Effluents and Direct Radiation from an ISFSI or MRS.

## 3.0 DEFINITIONS

- OFFSITE DOSE CALCULATION MANUAL (ODCM) shall be comprised of the radiological effluent technical specifications and methodology contained within this procedure and applicable sections of the Technical Requirements Manual (TRM) as listed on Attachment 7.23 of this procedure.

- UNRESTRICTED AREA (T.S. 1.36) shall be any area to which access is neither limited nor controlled by the licensee. The definition of UNRESTRICTED AREA used in implementing these Technical Specifications has been expanded over that in 10 CFR 20.1003. The UNRESTRICTED AREA boundary may coincide with the Exclusion (fenced) Area boundary, as defined in 10 CFR 100.3(a), but the UNRESTRICTED AREA does not include areas over water bodies. For calculations performed pursuant to 10 CFR 50.36a, the concept of UNRESTRICTED AREAS, established at or beyond the SITE BOUNDARY, is utilized in the Controls to keep levels of radioactive materials in liquid and gaseous effluents as low as is reasonably achievable, see Attachment 7.1.

- LIQUID RADWASTE TREATMENT SYSTEM shall be any system designed and installed to reduce radioactive material in effluents by passing liquid waste through filters and/or absorption or exchange media (e.g. Ion Exchanger Resin, Charcoal etc) and/or other reduction processes (e.g. reverse osmosis, etc) for the purpose of

removing radioactive materials from the liquid system prior to the release to the environment.

- A MAJOR CHANGE to a radioactive waste system shall be any alteration or modification to the system that causes waste characteristics (e.g. chemical composition, pH, etc.), waste form or waste activity (e.g. equipment decontamination factor change) in liquid, gaseous, or solid effluents to change, thereby requiring a re-evaluation of the effluent source terms.

- LOWER LIMITS OF DETECTION (LLD) is defined, for purposes of these specifications, as the smallest concentration of radioactive material in a sample that will yield a net count, above system background, that will be detected with 95% probability with only 5% probability of falsely concluding that a blank observation represents a "real" signal.

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

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

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

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

$S_b$ is the standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate, as counts per minute,

E is the counting efficiency, as counts per disintegration,

V is the sample size in units of mass or volume,
$2.22 \times 10^6$ is the number of disintegrations per minute per microcurie,

Y is the fraction radiochemical yield, when applicable,

$\lambda$ is the radioactive decay constant for the particular radionuclide, and

$\Delta t$ for plant effluents is the elapsed time between the midpoint of sample collection and the time of counting. For environmental samples it is the elapsed time between sample collection, or end of the sample collection period, and time of counting. Typical values of E, V, Y, and $\Delta t$ should be used in the calculation.

- An UNPLANNED/ABNORMAL RELEASE is defined as any unplanned, uncontrolled or unmonitored release of radioactive material to the UNRESTRICTED AREA for liquids or to the SITE BOUNDARY for gases. This includes any unplanned, uncontrolled or unmonitored releases where the radiological consequences may be minimal but where the potential exists for more serious radiological consequences if allowed to recur. Incidents that are to be classified as UNPLANNED/ABNORMAL RELEASES do not include releases that fall within the guidelines of a Secondary Release Pathway. Secondary Release Pathways are usually known and have been previously evaluated or considered.

- ISFSI is defined as Independent Spent Fuel Storage Installation.

## 4.0 RESPONSIBILITIES

- General Manager, Plant Operations has lead responsibility for ensuring implementation of the Radiological Effluent Specifications and Radiological Environmental Monitoring Program.

- The Chemistry Manager is responsible for
  a) ensuring Radiological Effluent Specifications, the Radiological Effluent Monitoring Program and Radiological Environmental Monitoring Program (REMP) is performed as required according to procedures and methodologies established by this document. 03/2015
  b) ensuring the Annual Effluent Release Report and the Annual Radiological Environmental Operating Report are performed and issued as required.
  c) ensuring the Land Use Census is performed as required.

## 5.0 PROCEDURE

### 5.1 SITE CHARACTERISTICS

Waterford 3 SES Site Characteristics is provided in Chapter 2 of Waterford 3 FSAR (Sections 2.1.1, 2.1.2 and 2.1.3).

A map of the SITE BOUNDARIES for establishing effluent release limits along with radioactive effluent release points are given in Attachment 7.1. The release point elevations for gaseous effluents are also provided in Attachment 7.1. The nearest distances to the boundary line are shown in Attachment 7.2 of this procedure.

## 5.2 SPECIFICATIONS AND SURVEILLANCE REQUIREMENTS

a. Compliance with the SPECIFICATIONS contained in this procedure and the TRM is required during the conditions specified therein; except that failure to meet the SPECIFICATIONS requires that the associated ACTION requirements shall be met.

b. Noncompliance with this procedure and the TRM shall exist when the requirements of the SPECIFICATION and/or associated ACTION requirements are not met within the specified time intervals. If the SPECIFICATION is restored prior to expiration of the specified time intervals, completion of the ACTION requirements is not required.

c. Surveillance Requirements shall be applicable during all conditions specified for individual systems unless otherwise stated in an individual Surveillance Requirement.

d. Each Surveillance Requirement shall be performed within the specified time interval with a maximum allowable extension not to exceed 25% of the surveillance interval.

e. Failure to perform a Surveillance Requirement within the specified time interval shall constitute a failure to meet the OPERABILITY requirements for a Specific System for Operation. Exceptions to these requirements are stated in the individual specifications. Surveillance Requirements do not have to be performed on inoperable equipment.

f. Failure to comply with the compensatory ACTION requirements or failure to complete the surveillance requirements within the specified time shall be documented and evaluated in accordance with LI-102 the Corrective Action Process, Condition Report and UNT-006-010, Event Notification and Reporting procedures.

## 5.3 LIQUID EFFLUENTS

### 5.3.1 Liquid Effluent Dose Calculation

**NOTE**

The Offsite Dose Calculation Manual (ODCM) follows the general models suggested by NUREG 0133 and Regulatory Guide 1.109. However, alternate calculation methods from those presented may be used provided the overall methodology is acceptable and consistent with regulation or provided the alternate methodology is conservative. In addition, the most up-to-date dose conversion factors and bioaccumulation factors may be substituted in lieu of Regulatory Guide 1.109 values.

**NOTE**

Actual step-by-step dose calculations will be performed by in-plant procedures which are consistent with the methodology presented in this document.

5.3.1.1 The dose commitment to an individual from radioactive materials in liquid effluents released to unrestricted areas are calculated for the purpose of implementing Section 5.3.2 using the following expression:

$$D_{t\ell} = \Delta t_{\ell} F_{\ell} \sum_{i=1}^{n} A_{it} C_{il\ell} \qquad (1)$$

$$D_{t} = \sum_{\ell=1}^{m} D_{t\ell} \qquad (2)$$

5.3 LIQUID EFFLUENTS (cont'd)

$D_{t\ell}$ = the cumulative dose commitment to the total body or any organ (t) from the liquid effluents for each liquid release in mrem during time period ($\ell$);

$D_t$ = the cumulative dose commitment to the total body or any organ (t) from the liquid effluents for all ($\ell$) time periods;

$\Delta t_\ell$ = the length of the $\ell$th time period over which the release is made, in hours;

$C_{i\ell}$ = the concentration of radionuclide (i) in undiluted liquid effluent during time period $\Delta t\ell$ from any liquid release, in µCi/ml;

$A_{it}$ = the site-related liquid ingestion dose commitment factor to the total body or any organ (t) for each identified nuclide (i) in mrem-ml/hr- µCi (Attachment 7.3), and;

5.3 LIQUID EFFLUENTS (cont'd)

$F_\ell$ = the near field average dilution factor for $C_{i\ell}$ during any liquid effluent release. Defined as the ratio of the undiluted liquid waste flow during release to the average flow from the site discharge structure to site boundary receiving waters.

$$= \frac{\text{liquid radioactive waste flow}}{\text{discharge structure exit flow}}$$

The liquid radioactive waste flow is the maximum flow from the effluent release. The discharge structure exit flow is the flow during disposal from the discharge structure release point into the receiving water body. For radionuclides not determined in each batch or weekly composite, the dose contribution to the current calendar quarter cumulative summation may be approximated by using a ratio of concentrations based on the previous monthly or quarterly composite analyses.

5.3 LIQUID EFFLUENTS (cont'd)

5.3.1.2 Equation (1) above for calculating the dose contributions requires the use of a dose factor, $A_{it}$, for each nuclide (i) which embodies the dose factors and dilution factors for the points of pathway origin. The adult total body dose factor and the adult organ dose factor for each radionuclide will be used from Table E-11 of Regulatory Guide 1.109; thus the list contains critical organ dose factors for various organs. The dose factor is written:

$$A_{it} = K_o \left(\frac{U_w}{D_w} + U_f BF_i\right) DCF_{it} \qquad (3)$$

where:

$A_{it}$ = Composite dose parameter for the total body or critical organ (t) of an adult for nuclide (i) for all appropriate pathways (mrem-ml/hr-µCi);

$K_o$ = Unit conversion factor;

$$= 1.14E+5 = 10^6 \frac{\text{pCi}}{\mu\text{Ci}} \cdot 10^3 \frac{\text{ml}}{\text{l}} \div 8760 \frac{\text{hr}}{\text{yr}}$$

$U_w$ = 730 l/yr adult water consumption (Reg. Guide 1.109, Table E-5);

5.3 LIQUID EFFLUENTS (cont'd)

$D_w$ = Dilution factor from near field area to potable water intake;

= 220
for discharges from the circulating water discharge into the Mississippi River (based on the ratio of the average Mississippi River flow to the maximum discharge flow);

= 1
for discharges into the 40 Arpent Canal (based on the assumption that dilution from the near field area to a potable water intake is negligible);

$U_f$ = 21 kg/yr, adult fish consumption (Reg. Guide 1.109, Table E-5);

$BF_i$ = Bioaccumulation factor for nuclide (i) in fish (pCi/kg per pCi/l) from Attachment 7.22 and;

$DCF_{it}$ = Ingestion Dose conversion factor for nuclide (i) and organ (t) for adults (mrem/pCi), from Attachment 7.21.

5.3 LIQUID EFFLUENTS (cont'd)

5.3.2 Liquid Effluent Monitor Setpoint Calculation Methodology

TRM specifications 3/4.11.1.1 and 3/4.3.3.10 require that the liquid effluent monitoring instrumentation alarm/trip setpoints be set so that the concentration of radioactive material released from the site is limited to 10 times the Effluent concentration values in 10CFR20, Appendix B, Table 2, Column 2 for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases, the concentration shall be limited to 2E-4 µCi/ml total activity. This section presents the method to be used for determining setpoints in accordance with TRM surveillance requirements 3/4.11.1.1 and 3/4.3.3.10.

5.3.2.1 The calculated setpoints for the liquid effluent monitors satisfy the following equation:

$$c = \frac{(SF)\ (RF)\ (F+f)\sum_{i=1}^{n} C_i}{(TEC)(f+F')} \qquad (4)$$

5.3 LIQUID EFFLUENTS (cont'd)

where;

c = the setpoint, in µCi/ml, of the liquid effluent monitor measuring the radioactivity concentration in the effluent line prior to complete dilution and subsequent release. This setpoint represents a value which, if exceeded would result in concentrations exceeding 10 times the Effluent concentration values of 10CFR20, Appendix B, Table 2. Column 2, to an UNRESTRICTED AREA;

SF = Safety Factor to ensure that the effluent limit is not exceeded. A value of 0.8 is normally used for SF;

RF = Release Fraction allocated to this release (to be used only in situations of simultaneous or concurrent release);

f = the undiluted liquid effluents flow as measured at the liquid effluent monitor location in gpm;

F = the dilution water flow as determined via pump curves or other appropriate measures that determine correct plant operating configuration in gpm;

**NOTE**

If F is large compared to f then F + f ~ F. If there is no additional dilution, F' = 0.

F' = additional dilution flow at the radiation monitor for liquid effluent radiation monitors that have additional dilution prior to actual withdrawal of the monitored fluid, in gpm.

= 1000 (maximum) for Steam Generator Blowdown or Auxiliary Component Cooling Water releases to the circulating water system.

= 0 for all other liquid release points.

5.3 LIQUID EFFLUENTS (cont'd)

$C_i$ = the undiluted concentration in µCi/ml for all gamma emitting radionuclides (i). The value will be derived from radioanalysis of liquid effluent to be released. This value will be supplied for each liquid release;

$$TEC = \sum_{i=1}^{n} \frac{C_i}{10EC_i} + \sum_{j=1}^{m} \frac{C_j}{10EC_j}$$

$Cj$ = the undiluted concentration, in µCi/ml, for all non-gamma emitting radionuclides (j). This value will be derived from radioanalysis of composite liquid effluents released. This value will be supplied for each liquid release based upon the most recent analysis results.

$\frac{C_i}{10EC_i}$ = the undiluted gamma $EC_i$ fraction for all gamma emitting radionuclides (i)

$\frac{C_j}{10EC_j}$ = the undiluted non-gamma $EC_j$ fraction for all non-gamma emitting radionuclides (j)

$10EC_i$ = 10 times the Effluent Concentration for the applicable gamma-emitting isotopes (i) from 10CFR20, Appendix B, Table 2, Column 2; and

$10EC_j$ = 10 times the Effluent Concentration for the applicable non-gamma emitting isotopes (j) from 10CFR20, Appendix B, Table 2, Column 2

5.3.2.2 The values of $C_i$ and $C_j$ will be measured for each release as appropriate and the parameters for f, F' and F will be supplied based on current plant operating configurations. The setpoint will be calculated in terms of µCi/ml and the liquid effluent monitor will be adjusted as necessary to ensure that liquid releases are secured prior to exceeding 10 times the Effluent concentration values specified in 10CFR20, Appendix B, Table 2, Column 2 to an UNRESTRICTED AREA.

## 5.3 LIQUID EFFLUENTS (cont'd)

### 5.3.3 Representative Liquid Sampling

Prior to grab sampling liquid waste tanks, methods should be used to guarantee representative sampling. Large volumes of liquid waste should be mixed in as short a time as possible and uniformly distributed prior to sampling. To determine the minimum mixing time for tanks from which releases are made, the following tests were performed prior to initial use for release purposes.

a. The tank was filled to a known volume.

b. A specific quantity of a selected chemical and/or sediments was added to the tank.

c. Recirculation was initiated through the normal path.

d. Periodic samples were taken until equilibrium was reached.

e. The time observed to completely mix the tank is used as a minimum recirculation time prior to effluent sampling. Records of the test will be maintained.

### 5.3.4 Dose Projection for Liquid Effluents

At least once every 31 days, the total dose from all liquid releases for the quarter-to-date will be divided by the number of days expired in the quarter and multiplied by 31.

## 5.4 GASEOUS EFFLUENTS

**NOTE**

The Offsite Dose Calculation Manual (ODCM) follows the general models suggested by NUREG 0133 and Regulatory Guide 1.109. However, alternate calculation methods from those presented may be used provided the overall methodology is acceptable and consistent with regulation or provided the alternate methodology is conservative.
In addition, the most up-to-date dose conversion factors and bioaccumulation factors may be substituted in lieu of Regulatory Guide 1.109 values.

**NOTE**

Actual step-by-step dose calculations will be performed by in-plant procedures which are consistent with the methodology presented in this document.

### 5.4.1 Calculational Methodology for Gaseous Effluent Dose Rate

This section presents the calculational methods used for calculating gaseous effluent doses in fulfillment of Specification

- The dose rate due to the radioactive materials released in gaseous effluents from the site to areas at and beyond the SITE BOUNDARY shall be limited to the following values and expressions:

5.4 GASEOUS EFFLUENTS (cont'd)

Release rate limit for Noble Gases:

$$K\overline{(X/Q)}_v \sum_{i=1}^{n} K_i\, Q_{iv} \leq 500\ \frac{mrem}{yr}\ \text{total body} \qquad (5)$$

$$\overline{(X/Q)}_v \sum_{i=1}^{n} (L_i + 1.1M_i)Q_{iv} \leq 3000\ \frac{mrem}{yr}\ \text{skin} \qquad (6)$$

Release rate limit for Iodine-131, Iodine-133, Tritium and for all radionuclides in particulate form with half-lives greater than 8 days:

$$\overline{(X/Q)}_v \sum_{i=1}^{n} P_{it} Q_{iv} \leq 1500\ \frac{mrem}{yr}\ \textit{any organ} \qquad (7)$$

Where:

$\overline{(X/Q)_v}$ = 1.1E-5 sec/m³ in the ESE sector at 0.6 mile for all vent releases (v) (the highest calculated annual average dispersion factor at the SITE BOUNDARY based on historical data Attachment 7.2). The actual X/Q for the time of release may be determined and used under certain circumstances;

$\sum_{i=1}^{n}$ = summation for all identified radionuclides;

5.4 GASEOUS EFFLUENTS (cont'd)

$K_i$ = the total body dose factor due to gamma emissions for each identified radionuclide (i) in units of mrem/yr per µCi/m³ (Attachment 7.4);

$L_i$ = the skin dose factor due to beta emissions for each identified radionuclide (i) in units of mrad/yr per µCi/m³ (Attachment 7.4);

$M_i$ = the air dose factor due to gamma emissions for each identified radionuclide (i) in units of mrad/yr per µCi/m³ (Attachment 7.4). The constant 1.1 converts air dose to skin dose;

$P_{it}$ = the thyroid dose parameter for Iodine-131, Iodine-133, tritium, and radionuclides in particulate form with half-lives greater than 8 days (i) for the inhalation pathway only, in mrem/yr per µCi/m³ (Attachment 7.19). The dose factor is based on the most restrictive age group (child) and most restrictive organ at the SITE BOUNDARY; and

5.4 GASEOUS EFFLUENTS (cont'd)

**NOTE**

All radioiodines are assumed to be released in elemental form.

$Q_{iv}$ = the average release rate of radionuclides (i) (either noble gas or Iodine-131, Iodine-133, tritium, and radionuclides in the particulate form with half-lives greater than 8 days, as appropriate) during the time of release from all vent releases (v). Value is averaged over one hour and is in units of µCi/sec.

5.4 GASEOUS EFFLUENTS (cont'd)

5.4.2 Calculational Methodology for Noble Gas Doses

The air dose due to noble gases released in gaseous effluents to areas at or beyond the SITE BOUNDARY will be determined by the following expressions:

a. During any calendar quarter,

for gamma radiation:

$$D_{\gamma} = (1.14E+2)\overline{(X/Q)}_v \sum_{i=1}^{n} M_i \sum_{j=1}^{m} \Delta t_j \, Q_{ijv} \qquad (8)$$

for beta radiation:

$$D_{\beta} = (1.14E+2)\overline{(X/Q)}_v \sum_{i=1}^{n} N_i \sum_{j=1}^{m} \Delta t_j \, Q_{ijv} \qquad (9)$$

b. During any calendar year,

for gamma radiation:

$$D_{\gamma} = (1.14E+2)\overline{(X/Q)}_v \sum_{i=1}^{n} M_i \sum_{j=1}^{m} \Delta t_j \, Q_{ijv} \qquad (10)$$

for beta radiation:

$$D_{\beta} = (1.14E+2)\overline{(X/Q)}_v \sum_{i=1}^{n} N_i \sum_{j=1}^{m} \Delta t_j \, Q_{ijv} \qquad (11)$$

5.4 GASEOUS EFFLUENTS (cont'd)

Where:

$D_\gamma$ = the total gamma ($\gamma$) air dose from gaseous effluents for the total time period and not to exceed 5 mrad quarterly and 10 mrad yearly;

$D_ß$ = the total beta (ß) air dose from gaseous effluents for the total time period and not to exceed 10 mrad quarterly and 20 mrad yearly;

1.14E-04 = a constant of (1 yr/8760 hr);

$\overline{(X/Q)_v}$ = 1.1E-5 sec/m³ in the ESE sector at 0.6 mile for all vent releases (v). The actual X/Q for the time of release may be determined and used under certain circumstances;

5.4 GASEOUS EFFLUENTS (cont'd)

$M_i$ and $N_i$ = the gamma and beta air dose factors (respectively) for a uniform semi-infinite cloud of radionuclide (i) in mrad/yr per µCi/m³ (Attachment 7.4);

$\Delta t_j$ = the length of the jth time period over which $Q_{ijv}$ are accumulated for all gaseous releases in hours; and

$Q_{ijv}$ = the average release rate of radionuclides (i) in gaseous effluent from all vent releases (v) in µCi/sec during the time period $\Delta t_j$.

5.4 GASEOUS EFFLUENTS (cont'd)

5.4.3 Calculational Methodology for Doses Due to Radioiodines, Tritium, and Radioactive Materials in Particulate Form

The dose to an individual from iodine-131, iodine-133, tritium, and radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents released to areas at and beyond the SITE BOUNDARY will be determined by the following expressions:

During any calendar quarter:

$$D_{ita} = 1.14E-4\ \Delta t \sum_{i=1}^{n} R_{ita}\ W_v\ Q_{iv} \qquad (12)$$

During any calendar year:

$$D_{ita} = 1.14E-4\ \Delta t \sum_{i=1}^{n} R_{ita}\ W_v\ Q_{iv} \qquad (13)$$

5.4 GASEOUS EFFLUENTS (cont'd)

Where:

$D_{ita}$ = the cumulative dose to an organ (t), age group (a), due to radionuclides (i) in gaseous effluents; not to exceed 7.5 mrem quarterly or 15 mrem yearly;

1.14E-4 = a constant of unit conversion

= 1 yr/8760 hr;

$\Delta t$ = the time required for the release in hours for all releases per quarter or per year.

$W_v$ = the dispersion parameter for estimating the dose to an individual at the controlling location for long term vent releases (v);

= $\overline{(X/Q)}_v$ for the inhalation pathway from vent releases (v) in sec/m³, from historical data, at the location of the critical receptor (Attachment 7.2);

= $\overline{(D/Q)}_v$ for the food and ground plane pathways from vent releases (v) in 1/m², from historical data at the location of the critical receptor (Attachment 7.2), with the exception of tritium, which shall use $W_v = \overline{(X/Q)}_v$;

5.4 GASEOUS EFFLUENTS (cont'd)

$R_{ita}$ = the dose factor from each identified radionuclide (i), for each applicable organ (t), and age group (a), in mrem/yr per $\mu$Ci/m³ for the inhalation pathway (Attachment 7.5) and in mrem/yr per uCi/m²-sec for the food and ground plane pathways (Attachments 7.6, 7.7, 7.8, 7.9, and 7.10). For sectors with real pathways within 5 miles of the plant, the values of $R_i$ are used based on these real pathways. ($R_i$'s were calculated using the methodology found in NUREG 0133 (pages 31-36.); and

$Q_{iv}$ = the average release rate of radionuclides (i) in gaseous effluent from all vent releases (v) in µCi/sec.

## 5.4 GASEOUS EFFLUENTS (cont'd)

### 5.4.4 Gaseous Effluent Monitor Setpoint Calculational Methodology

5.4.4.1 The calculated high alarm/flow termination setpoint is the maximum value for that particular release. An administrative Safety Factor (SF) will be utilized in the setpoint calculation. To allow for simultaneous releases from common or different release points a Release Fraction (RF) may be used to allocate percentages of the total allowable release.

5.4.4.2 Since the noble gas dose rates are more limiting than the radioiodine dose rate, gaseous setpoints will be based on noble gas dose rates (less than or equal to 500 mrem/yr total body, and less than or equal to 3000 mrem/yr skin). Specifically, gaseous setpoints will be based on the most limiting of the following equations:

5.4 GASEOUS EFFLUENTS (cont'd)

a. Total body ($Q_{tb}$):

$$Q_{tb} = \frac{(500\,\frac{mrem}{yr})(RF)(SF)}{\overline{(\chi/Q)_v}\;\frac{\left[\sum_{i=1}^{n} K_i Q_{iv}\right]}{\left[\sum_{i=1}^{n} Q_{iv}\right]}} \qquad (14)$$

Where:

$Q_{tb}$ = maximum release rate allowed to give a limiting total body dose rate of 500 mrem/yr in µCi/sec;

$\sum_{i=1}^{n}$ = summation of all nuclides considered;

$K_i$ = the total body dose factor due to gamma emissions for each identified radionuclide (i) in units of mrem/yr per µCi/m³ (Attachment 7.4);

5.4 GASEOUS EFFLUENTS (cont'd)

$Q_{iv}$ = average release rate of isotope (i) from the release point (v) in µCi/sec;

$\overline{(\chi/Q)}_v$ = 1.1E-5 sec/m³ (in the ESE sector at 0.6 mile). The sector with highest value of annual average atmospheric dispersion factor at the site boundary for the release point (v) in question;

RF = release fraction allotted to release point in consideration; and

SF = administrative safety factor to account for uncontrollable variables (sampling, monitoring errors, etc.). A value of 0.8 is normally used for SF.

5.4 GASEOUS EFFLUENTS (cont'd)

b. For Skin (Q skin):

$$Q_{skin} = \frac{(3000\ \frac{mrem}{yr})(RF)(SF)}{\overline{(\chi/Q)_v}\ \frac{\left[\sum_{i=1}^{n}(L_i + 1.1M_i)Q_{iv}\right]}{\left[\sum_{i=1}^{n}Q_{iv}\right]}} \quad (15)$$

Where:

all terms are as defined in Step (a) for $Q_{tb}$,
except:

$Q_{skin}$ = maximum release rate allowed to give a limiting skin dose of 3000 mrem/yr in µCi/sec;

$L_i$ = skin dose factor due to beta emissions for each identified radionuclide (i) in units of mrem/yr per µCi/m³ (Attachment 7.4);

1.1 = conversion factor to convert from air to skin dose; and

$M_i$ = air dose factor due to gamma emissions for identified noble gas isotope (i) in units of mrad/yr per µCi/m³ (Attachment 7.4).

5.4 GASEOUS EFFLUENTS (cont'd)

5.4.4.3 The monitor setpoint is calculated in the following manner:

$$SN = \frac{Q}{(F_{max})(472)} \qquad (16)$$

Where:

SN = maximum monitor setpoint in μCi/cm$^3$;

Q = Minimum value of $Q_{tb}$ or $Q_{skin}$ (μCi/sec).

$F_{max}$ = maximum effluent flow rate (cfm); and

472 = Unit conversion, CFM to cm$^3$/sec

5.4 GASEOUS EFFLUENTS (cont'd)

5.4.5 Dose Projection due to Gaseous Effluents

5.4.5.1 At least once every 31 days the gamma air dose, beta air dose and the maximum organ dose for the month-to-quarter will be divided by the number of days into the quarter and multiplied by 31.

## 5.5 40 CFR190 DOSE EVALUATION

For the evaluation of doses to real individuals from liquid releases, the same calculational methods as employed in Section 5.3.4 will be used. However, more encompassing and realistic assumptions will be made concerning the dilution and ingestion of radionuclides by individuals who live and fish in the Waterford 3 area.

The results of the Radiological Environmental Monitoring Program will be used in determining the realistic dose based on actual measured radionuclide concentrations. For the evaluation of doses to real individuals from gaseous releases, the same calculational methods as employed in sections 5.4.6 and 5.4.7 will be used. The total body dose factor should be substituted for the gamma air dose factor ($M_i$) to determine the total body dose. Otherwise, the same calculational sequence applies. More realistic assumptions will be made concerning the actual location of real individuals, the meteorological conditions, and the consumption of food. Data obtained from the latest land use census should be used to determine locations for evaluating doses. The results of the Radiological Environmental Monitoring Program will be included in determining more realistic doses based on actual measured radionuclide concentrations.

Cumulative dose contributions from direct radiation, from the reactor unit, from ISFSI operations, and from Radwaste Storage Tanks shall be determined utilizing the results of routine plant perimeter surveys, TLD data, or a combination of both when necessary.

## 5.6 LIQUID AND GASEOUS RADWASTE PROCESSES

The block flow diagrams of the radwaste systems are shown in Attachments 7.11 and 7.12. In order to obtain a more detailed description, see the appropriate sections of the FSAR.

## 5.7 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM REQUIREMENTS

### 5.7.1 Description of the Radiological Environmental Monitoring Program

The Radiological Environmental Monitoring Program (REMP) is expounded on in Attachment 7.13, and the Sample Location Table, Attachment 7.14. Attachment 7.15 explains the sector and zone designations for the sample locations. Attachments 7.16, 7.17 and 7.18 show the sample locations within the 2,10, and 50 mile radius of Waterford 3.

Deviations are permitted from the required sampling schedule if specimens are unobtainable due to hazardous conditions, seasonal unavailability, malfunction of automatic sampling equipment and other legitimate reasons. If specimens are unobtainable due to sampling equipment malfunction, every effort shall be made to complete corrective action prior to the end of the next sampling period. All deviations from the sampling schedule shall be documented in the Annual Radiological Environmental Operating Report. It is recognized that, at times, it may not be possible or practical to continue to obtain samples of the media of choice at the most desired location or time. In these instances, suitable alternative media and locations may be chosen for the particular pathway in question and appropriate substitutions made within 30 days in the Radiological Environmental Monitoring Programs.

## 5.7 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM REQUIREMENTS (Cont'd)

### 5.7.2 Description of the Interlaboratory Comparison Program

Quality assurance in radiological environmental sampling will be maintained through participation in a selected Radiological Laboratory Quality Assurance Program. The summary of results will be presented in tabular form and will include the type of analysis, the preparation (collection) date, the date the results are returned, the mean of the analyses (usually triplicate), the standard deviation, the date the values are released for information, the known value, the three standard deviation limit, and a two standard deviation/three standard deviation warning/action flag. If the sample analysis indicates results outside the three standard deviation range, then the corrective actions taken to prevent a recurrence will be documented and submitted along with all results when the Annual Radiological Environmental Operating Report is submitted.

## 5.7 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM REQUIREMENTS (Cont'd)

### 5.7.3 Dispersion Parameters For Critical Locations

The dispersion parameters for the site boundary and where necessary, as identified by the Land Use Census, are listed in Attachment 7.2. This table will be subject to changes based on the Land Use Census and historical data.

## 5.8 ROUTINE EFFLUENT RELEASE REPORTS

### 5.8.1 Annual Radioactive Effluent Release Report

A routine Radioactive Effluent Release Report covering the operation of the unit during the previous Twelve months shall be submitted as specified in Waterford 3 SES, Technical Specification 6.9.1.8 prior to May 1 of each year. The radioactive effluent release report shall include:

5.8.1.1 A summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from the units as outlined in Regulatory Guide 1.21, with data summarized on a quarterly basis following the format of Appendix B thereof.

5.8.1.2 An annual summary of hourly meteorological data collected over the previous year. This annual summary may be either in the form of an hour-by-hour listing of wind speed, wind direction, and atmospheric stability, and precipitation (if measured) on magnetic tape, or in the form of joint frequency distributions of wind speed, wind direction, and atmospheric stability.

5.8 ROUTINE EFFLUENT RELEASE REPORTS (cont'd)

In lieu of submission with the Radioactive Effluent Release Report, the summary of required meteorological data may be filed on site and shall be provided to the NRC upon request. This same report shall include an assessment of the radiation doses due to the radioactive liquid and gaseous effluents released from the unit or station during the previous calendar year. This same report shall also include an assessment of the radiation doses from radioactive liquid and gaseous effluents to MEMBERS OF THE PUBLIC due to their activities inside the SITE BOUNDARY (Attachment 7.1) during the reporting period. All assumptions used in making these assessments (i.e., specific activity, exposure time and location) shall be included in these reports. The meteorological conditions concurrent with the time of release of radioactive materials in gaseous effluents, as determined by sampling frequency and measurement, shall be used for determining the gaseous pathway doses. The assessment of radiation doses shall be performed in accordance with the methodology and parameters in this manual.

5.8 ROUTINE EFFLUENT RELEASE REPORTS (cont'd)

5.8.1.3 An assessment of radiation doses to the likely most exposed MEMBER OF THE PUBLIC from reactor releases and other nearby uranium fuel cycle sources, including doses from primary effluent pathways and direct radiation, for the previous calendar year to show conformance with 40CFR190, "Environmental Radiation Standards for Nuclear Power Operation" and 72.104, “Criteria for Radioactive Materials in Effluents and Direct Radiation from an ISFSI or MRS”. Acceptable methods for calculating the dose contribution from liquid and gaseous effluents are given in Regulatory Guide 1.109, Rev. 1, October 1977, and NUREG-0133.

5.8.1.4 The following information for each class of solid waste (as defined by 10CFR 61) shipped off site during the report period:

A. Container volume

B. Total curie quantity (specify whether determined by measurement or estimate),

C. Principal radionuclides (specify whether determined by measurement or estimate),

D. Source of waste and processing employed (e.g., dewatered spent resin, compacted dry waste, evaporator bottoms),

E. Type of container (e.g., LSA, Type A, Type B Large Quantity), and

F. Solidification agent or absorbent (e.g., cement, urea formaldehyde).

5.8 ROUTINE EFFLUENT RELEASE REPORTS (cont'd)

5.8.1.5 A list and description of unplanned releases from the site to UNRESTRICTED AREAS of radioactive materials in gaseous and liquid effluents made during the reporting period.

5.8.1.6 Any changes to the Process Control Program (PCP) or the Offsite Dose Calculation Manual (ODCM), pursuant to Technical Specification 6.13 and 6.14, as well as a listing of new locations for dose calculations and/or environmental monitoring identified by the land use census. It shall also include information of any MAJOR CHANGES to Radioactive Waste Systems if the information is not submitted as part of the annual FSAR update. Any changes made to the sections of the Waterford III TRM listed on Attachment 7.23 shall be included as part of submittal of the changes made to the ODCM.

5.8 ROUTINE EFFLUENT RELEASE REPORTS (cont'd)

A. The submittal providing information on ODCM changes shall contain:

1. Sufficiently detailed information to totally support the rationale for the change without benefit of additional or supplemental information. Information submitted should consist of a complete legible copy of the ODCM including the sections of the TRM listed on Attachment 7.23 together with appropriate analyses or evaluations justifying the change(s), if applicable.

2. A determination that the change did not reduce the accuracy or reliability of dose calculations or setpoint determinations.

3. Documentation of the fact that the change has been reviewed and found acceptable by the Onsite Safety Review Committee (OSRC).

5.8 ROUTINE EFFLUENT RELEASE REPORTS (cont'd)

B. The submittal providing information on PCP changes shall contain:

1. Information submitted should consist of a complete legible copy of the PCP, together with appropriate analyses or evaluations, justifying the changes(s), if applicable.

2. Documentation of the fact that the change has been reviewed and found acceptable by the OSRC.

**NOTE**

Radioactive Waste System change information may be submitted as part of the annual FSAR update in lieu of the Annual Radioactive Effluent Release Report.

C. The submittal providing information on licensee initiated MAJOR CHANGES to the radioactive waste systems (liquid, gaseous, and solid) shall contain:

1. A summary of the evaluation that led to the determination that the change could be made in accordance with 10CFR50.59

2. Sufficient detailed information to totally support the reason for the change without benefit of additional or supplemental information.

3. A detailed description of the equipment, components and processes involved and the interfaces with other plant systems.

4. An evaluation of the change which shows the predicted releases of radioactive materials in liquid and gaseous effluents and/or quantity of solid waste that differ from those previously predicted in the license application and amendments thereto.

5. An evaluation of the change which shows the expected maximum exposures a member of the Public in the unrestricted area and to the general population that differ from those previously estimated in the license application and amendments thereto.

5.8 ROUTINE EFFLUENT RELEASE REPORTS (cont'd)

6. A comparison of the predicted releases of radioactive materials, in liquid and gaseous effluents and in solid waste, to the actual releases for the period before the changes are to be made.

7. An estimate of the exposure to plant operating personnel as a result of the change.

8. Documentation of the fact that the change was reviewed and found acceptable by the OSRC.

9. Changes to Radioactive Waste Systems performed using the plant design change process will be reported as per design change procedures.

5.8.1.7 If applicable, a description of events which led to exceeding the following limiting condition for operation:

A. The dose rate due to radioactive materials released in gaseous effluents from the site to areas at and beyond the site boundary shall be limited to TRM specification 3/4.11.2.1.

B. The quantity of radioactive material contained in each unprotected tank shall be limited to Technical Specification 3/4.11.1.4.

5.8 ROUTINE EFFLUENT RELEASE REPORTS (cont'd)

5.8.1.8 If applicable, identify the cause of the unavailability of milk or fresh leafy vegetable samples at locations required by TRM specification Table 3.12-1. The new location(s) for obtaining replacement samples shall be identified. Revised figure(s) and table for the ODCM reflecting the new locations shall be included in the report.

5.8.1.9 Identify the new location(s), if a land use census identifies an environmental sampling location that yields a calculated dose or dose commitment greater than the values currently being calculated pursuant to TRM Specification 3/4.11.2.3.

5.8.1.10 Identify the new location(s), and include a revised figure(s) and table for the ODCM reflecting the new location(s) if a land use census identifies an environmental sampling location(s) that yields a calculated dose or dose commitment (via the same exposure pathway) 20% greater than at a location from which samples are currently being obtained pursuant to TRM Specification 3/4.12.1.

5.8 ROUTINE EFFLUENT RELEASE REPORTS (cont'd)

5.8.1.11 With less than the minimum number of radioactive liquid or gaseous effluent monitoring instrumentation channels operable for 30 days or longer, as required by TRM Specification Table 3.3-12 or 3.3-13, explain in the next Annual Radioactive Effluent Release Report, pursuant to Technical Specification 6.9.1.8, why this inoperability was not corrected within the time specified.

**NOTE**

The Shift Manager shall be immediately notified and a Condition Report promptly initiated whenever an effluent sample is late or missing in accordance with applicable Specifications.

5.8.1.12 Identify any missing or late analysis results for radioactive effluent samples collected during the reporting period.

5.8.2 Annual Radioactive Effluent Release Report for Dry Fuel Storage pursuant to 10CRF72.44(d)(e)

An annual Radioactive Effluent Release Report specifying the quantity of each of the principal radionuclides released to the environment in liquid and in gaseous effluents during the previous 12 months of operation and such other information as may be required by the Commission to estimate maximum potential radiation dose commitment to the public resulting from effluent releases during the previous Twelve months shall be submitted in accordance with the Waterford 3 Certificate of Compliance TS. 5.4 within 60 days after the end of the 12-month monitoring period.

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## 5.9 SPECIAL EFFLUENT REPORTS

5.9.1 The Shift Manager shall be immediately notified and a Condition Report promptly initiated whenever any of the following specifications have been exceeded. A Special Report shall be prepared for submittal to the NRC within 30 day period, as per the ACTION requirement of the specification that has been exceeded.

- TRM Radioactive Liquid Effluent Dose Specification 3/4.11.1.2
- TRM Radioactive Liquid Waste Treatment System Specification 3/4.11.1.3
- TRM Radioactive Gaseous Effluent Dose, Noble Gas Specification 3/4.11.2.2
- TRM Radioactive Gaseous Effluent Dose, Iodine 131, I-133, Tritium, and Radionuclides in Particulate Form Specification 3/4.11.2.3
- TRM Radioactive Gaseous Waste Treatment System Specification 3/4.11.2.4
- TRM Radioactive Effluent Total Dose Specification 3/4.11.4

## 5.9 SPECIAL EFFLUENT REPORTS (cont'd)

### 5.9.2 Environmental Protection Agency Reportable Quantities

If any of TRM specifications 3/4.11.1.1, 3/4.11.1.2, 3/4.11.2.1, 3/4.11.2.2, 3/4.11.2.3 have been exceeded, an evaluation of the Radioactivity released verses EPA Reportable Quantities (RQ's) shall be performed as soon as practical.

The Shift Manager shall be immediately notified and a Condition Report promptly initiated whenever any radionuclide released over a 24 hour period is greater than or equal to the EPA RQ. Notification requirements shall be performed as per UNT-006-010, Event Evaluation and Reporting. Recipients of notification are: The National Response Center, the State Emergency Response Commission, and the Local Emergency Planning Committee. Methods for determination of reportability and the Reportable Quantities values for radionuclides are contained within 40CFR302.

5.9 SPECIAL EFFLUENT REPORTS (cont'd)

5.9.3 Unplanned/Abnormal Effluent Releases

5.9.3.1 A Condition Report should be initiated, in accordance with LI-102, for an UNPLANNED/ABNORMAL RELEASE to ensure that reporting requirements are determined. The Condition Report shall also serve to document causes and corrective actions. Major liquid spills or gaseous releases can occur through improper valve line-up, pipe breakage, or leakage. Each incident should be treated on a case-by-case basis.

The Condition Report shall include:

- a description of the event and equipment involved,
- cause(s) for the release,
- consequences of the release (if known or available)
- actions taken to prevent recurrence.

It is recognized that all elements that are to be included in the Condition Report (listed above) may not be known when the Condition Report is initiated. These items should be included while using the normal Condition Reporting process.

All Condition Reports for UNPLANNED/ABNORMAL RELEASES shall be reviewed by:

- OSRC
- SRC
- The Vice President - Operations

The OSRC shall review evaluations, recommendations, and the disposition of corrective action(s) to prevent recurrence as documented in the Condition Report. These reports will be forwarded to the Safety Review Committee and the Vice President - Operations for additional review.

5.9 SPECIAL EFFLUENT REPORTS (cont'd)

5.9.3.2 Prepare an effluent assessment report for each occurrence of an UNPLANNED/ABNORMAL RELEASE of radioactive materials. The purpose of this report is to document offsite impacts due to radioactive effluent releases. This report should include a description of the event, remedial actions, results of sampling and analysis (if applicable). The assessment should include evaluations of the following:

- concentrations of radioactive materials in unrestricted areas
- doses to the most likely exposed member of the public
- any environmental impacts due to radioactivity in the environment.

All assumptions and calculations used should be described and provided when necessary to support the conclusions. Doses should be calculated in accordance with the methods and parameters contained within the ODCM. Each occurrence of an UNPLANNED/ABNORMAL RELEASE should also be included in the Annual Effluent Release Report covering the period for which the event occurred as per step 5.8.1.5.

Each effluent assessment report shall be reviewed by:

- OSRC
- SRC
- The Vice President - Operations

## 5.10 SECONDARY RELEASE PATHS

5.10.1 This section addresses potential release pathways which should not contribute more than 10% of the annual doses evaluated in this manual. The ODCM methodology for calculation of doses will be applied to an applicable release path if a likely potential arises for contributing more than 10% of the annual doses evaluated in this manual.

5.10.2 Secondary Release Paths are expected to release trivial quantities of radionuclides. Some examples of Secondary Release Paths are listed below:

- Unmonitored Secondary System Steam Vents/Reliefs
- Decon Shop/Hot Machine Shop Exhaust
- Turbine Building Ventilation Exhaust
- Unmonitored Tank Atmospheric Vents
- Radioactive Waste Compactor Building
- Radioactive Waste Solidification Building
- Cooling Tower Atmospheric Entrainment

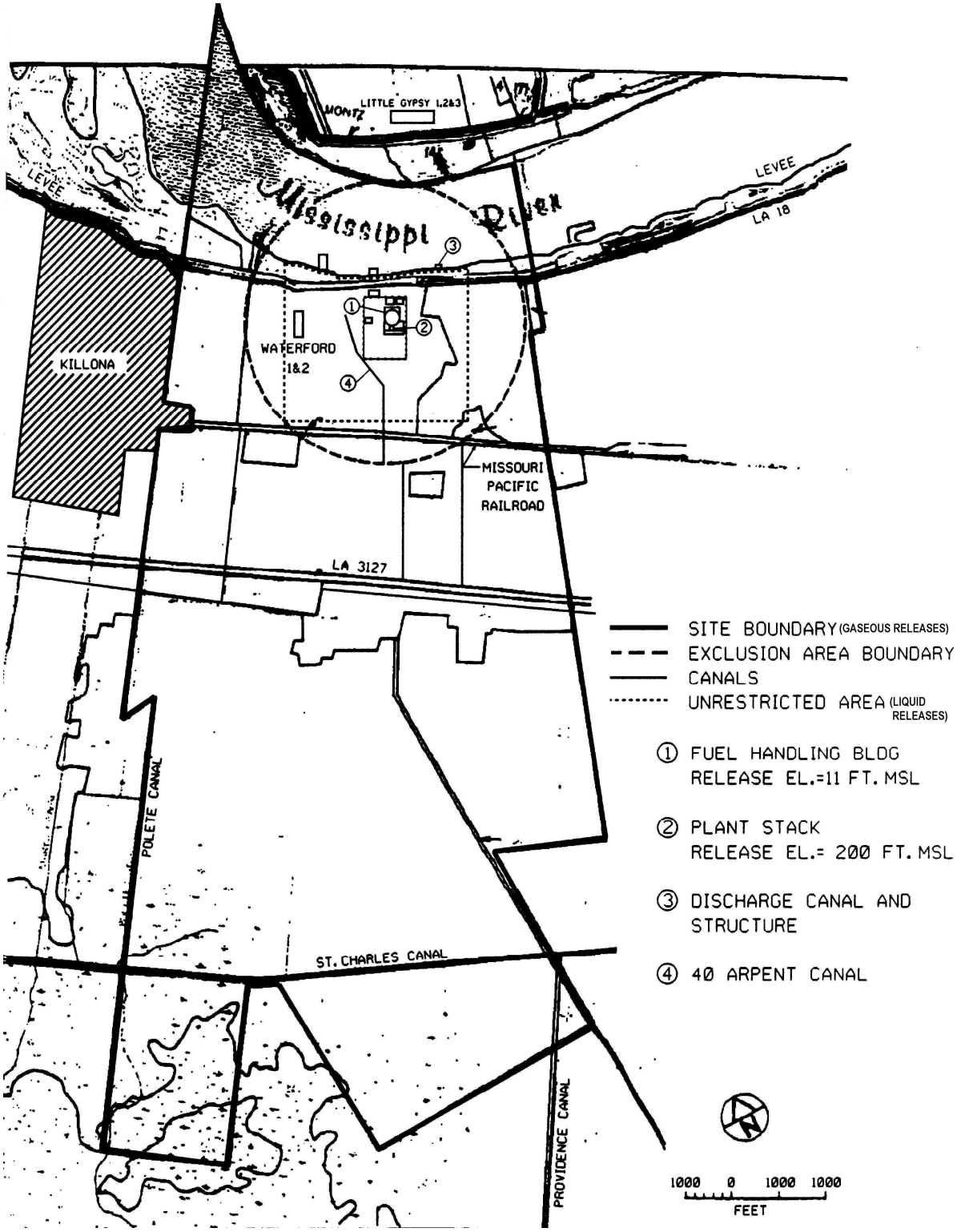
## 6.0 RECORDS

None

## 7.0 ATTACHMENTS

Refer to Table of Contents

BOUNDARIES FOR
RADIOACTIVE GASEOUS AND LIQUID EFFLUENTS



# HISTORICAL AVERAGE DISPERSION AND DEPOSITION PARAMETERS FOR AREAS AT OR BEYOND THE UNRESTRICTED AREA BOUNDARY

ANNUAL AVERAGE ATMOSPHERIC DISPERSION AND DEPOSITION PARAMETERS
BASED ON HISTORICAL METEOROLOGICAL DATA AND CURRENT LAND USE CENSUS

| Receptor Type or Location | Direction from Site | Sector Location | Distance from Site (miles) | Distance from Site (meters) | X/Q No Decay Undepleted (sec/m3) | D/Q (1/m2) |
|---|---|---|---|---|---|---|
| Site Boundary | N[a] | A | 0.8 | 1287 | 1.0e-05 | 2.4e-08 |
| | NNE[a] | B | 0.6 | 966 | 1.6e-05 | 3.4e-08 |
| | NE[a] | C | 0.6 | 966 | 1.5e-05 | 2.8e-08 |
| | ENE[a] | D | 0.6 | 966 | 1.6e-05 | 2.5e-08 |
| | E | E | 0.8 | 1287 | 6.9e-06 | 1.3e-08 |
| | ESE | F | 0.6 | 966 | 1.1e-05 | 2.3e-08 |
| | SE | G | 0.6 | 966 | 1.1e-05 | 3.1e-08 |
| | SSE | H | 0.8 | 1287 | 6.3e-06 | 2.4e-08 |
| | S | J | 1.6 | 2575 | 8.9e-07 | 2.7e-09 |
| | SSW | K | 3.1 | 4989 | 3.0e-07 | 7.9e-10 |
| | SW | L | 3.4 | 5472 | 3.3e-07 | 9.1e-10 |
| | WSW | M | 1.5 | 2414 | 1.7e-06 | 4.9e-09 |
| | W | N | 1.0 | 1609 | 2.3e-06 | 7.3e-09 |
| | WNW | P | 0.8 | 1287 | 7.5e-06 | 2.7e-08 |
| | NW | Q | 0.8 | 1287 | 1.0e-05 | 3.2e-08 |
| | NNW | R | 0.9 | 1448 | 9.4e-06 | 2.4e-08 |
| Residence | N | A | 0.9 | 1448 | 7.8e-06 | 1.8e-08 |
| | NNE | B | 1.3 | 2092 | 3.0e-06 | 5.8e-09 |
| | NE | C | 0.9 | 1448 | 6.3e-06 | 1.2e-08 |
| | ENE | D | 0.9 | 1448 | 6.8e-06 | 1.1e-08 |
| | E | E | 2.2 | 3541 | 7.4e-07 | 1.0e-09 |
| | ESE | F | 3.1 | 4989 | 3.7e-07 | 4.8e-10 |
| | SE | G | 4.0 | 6437 | 2.3e-07 | 3.6e-10 |
| | W | N | 1.0 | 1609 | 2.3e-06 | 7.3e-09 |
| | WNW | P | 0.9 | 1448 | 5.6e-06 | 2.0e-08 |
| | NW | Q | 0.9 | 1448 | 7.7e-06 | 2.3e-08 |
| | NNW | R | 3.0 | 4828 | 7.7e-07 | 1.3e-09 |
| Milk Cow | NW[b] | Q | 0.9 | 1448 | 7.7e-06 | 2.3e-08 |
| | NW | Q | 4.9 | 7886 | 2.6e-07 | 4.1e-10 |
| Vegetable Garden | N | A | 1.0 | 1609 | 6.1e-06 | 1.4e-08 |
| | NNE | B | 1.3 | 2092 | 3.0e-06 | 5.8e-09 |
| | NE | C | 0.9 | 1448 | 6.3e-06 | 1.2e-08 |
| | ENE | D | 0.9 | 1448 | 6.8e-06 | 1.1e-08 |
| | E | E | 2.2 | 3541 | 7.4e-07 | 1.0e-09 |
| | ESE | F | 2.2 | 3541 | 7.0e-07 | 1.1e-09 |
| | SE | G | 2.3 | 3701 | 6.2e-07 | 1.3e-09 |
| | WSW | M | 1.5 | 2414 | 1.7e-06 | 4.9e-09 |
| | W | N | 1.1 | 1770 | 1.9e-06 | 5.7e-09 |
| | WNW | P | 0.9 | 1448 | 5.6e-06 | 2.0e-08 |
| | NW | Q | 0.9 | 1448 | 7.7e-06 | 2.3e-08 |
| | NNW | R | 3.0 | 4828 | 7.7e-06 | 1.3e-09 |
| Beef Cow | E | E | 3.2 | 5150 | 3.7e-07 | 4.2e-10 |
| | ESE | F | 3.5 | 5633 | 3.0e-07 | 3.6e-10 |
| | SE | G | 4.5 | 7242 | 1.9e-07 | 2.8e-10 |
| | WSW | M | 1.2 | 1931 | 2.7e-06 | 8.6e-09 |
| | WNW | P | 0.9 | 1448 | 5.6e-06 | 2.0e-08 |
| | NW | Q | 0.9 | 1448 | 7.7e-06 | 2.3e-08 |
| | NNW | R | 2.3 | 3701 | 1.3e-06 | 2.4e-09 |

Notes: [a] The site boundary in this sector is located over water. The location cannot be occupied continuously for the life of the plant.

[b] The animals at this location do not produce milk for human consumption.

# SITE RELATED LIQUID INGESTION DOSE COMMITMENT FACTORS ($A_i$) FOR INDIVIDUAL NUCLIDES

Ai factors for Adult age group by nuclide.
Waterford Steam Electric Station Unit III
Discharge point : Circulating Water Discharge to Mississippi River
Dilution Factor DW = 220.0

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| H-3 | 0.00e+00 | 1.52e-01 | 1.52e-01 | 1.52e-01 | 1.52e-01 | 1.52e-01 | 1.52e-01 |
| Be-10 | 1.64e+01 | 2.54e+00 | 4.10e-01 | 0.00e+00 | 1.92e+00 | 0.00e+00 | 1.38e+02 |
| C-14 | 3.13e+04 | 6.26e+03 | 6.26e+03 | 6.26e+03 | 6.26e+03 | 6.26e+03 | 6.26e+03 |
| N-13 | 3.00e+03 | 3.00e+03 | 3.00e+03 | 3.00e+03 | 3.00e+03 | 3.00e+03 | 3.00e+03 |
| F-18 | 1.52e+01 | 0.00e+00 | 1.68e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.50e-01 |
| Na-22 | 4.17e+03 | 4.17e+03 | 4.17e+03 | 4.17e+03 | 4.17e+03 | 4.17e+03 | 4.17e+03 |
| Na-24 | 4.08e+02 | 4.08e+02 | 4.08e+02 | 4.08e+02 | 4.08e+02 | 4.08e+02 | 4.08e+02 |
| P-32 | 4.62e+07 | 2.87e+06 | 1.79e+06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.19e+06 |
| Ca-41 | 1.78e+04 | 0.00e+00 | 1.92e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.77e+01 |
| Sc-46 | 2.85e-02 | 5.53e-02 | 1.61e-02 | 0.00e+00 | 5.16e-02 | 0.00e+00 | 2.69e+02 |
| Cr-51 | 0.00e+00 | 0.00e+00 | 1.27e+00 | 7.62e-01 | 2.81e-01 | 1.69e+00 | 3.21e+02 |
| Mn-54 | 0.00e+00 | 4.38e+03 | 8.35e+02 | 0.00e+00 | 1.30e+03 | 0.00e+00 | 1.34e+04 |
| Mn-56 | 0.00e+00 | 1.10e+02 | 1.95e+01 | 0.00e+00 | 1.40e+02 | 0.00e+00 | 3.52e+03 |
| Fe-55 | 6.59e+02 | 4.56e+02 | 1.06e+02 | 0.00e+00 | 0.00e+00 | 2.54e+02 | 2.61e+02 |
| Fe-59 | 1.04e+03 | 2.45e+03 | 9.38e+02 | 0.00e+00 | 0.00e+00 | 6.83e+02 | 8.15e+03 |
| Co-57 | 0.00e+00 | 2.10e+01 | 3.49e+01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.33e+02 |
| Co-58 | 0.00e+00 | 8.95e+01 | 2.01e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.81e+03 |
| Co-60 | 0.00e+00 | 2.57e+02 | 5.67e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.83e+03 |
| Ni-59 | 2.34e+03 | 8.03e+02 | 3.91e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.65e+02 |
| Ni-63 | 3.12e+04 | 2.16e+03 | 1.05e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.51e+02 |
| Ni-65 | 1.27e+02 | 1.64e+01 | 7.51e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.17e+02 |
| Cu-64 | 0.00e+00 | 1.00e+01 | 4.70e+00 | 0.00e+00 | 2.52e+01 | 0.00e+00 | 8.53e+02 |
| Zn-65 | 2.32e+04 | 7.37e+04 | 3.33e+04 | 0.00e+00 | 4.93e+04 | 0.00e+00 | 4.64e+04 |
| Zn-69 | 4.93e+01 | 9.43e+01 | 6.56e+00 | 0.00e+00 | 6.13e+01 | 0.00e+00 | 1.42e+01 |
| Zn-69m | 8.14e+02 | 1.95e+03 | 1.79e+02 | 0.00e+00 | 1.18e+03 | 0.00e+00 | 1.19e+05 |
| Se-79 | 0.00e+00 | 1.07e+03 | 1.79e+02 | 0.00e+00 | 1.85e+03 | 0.00e+00 | 2.19e+02 |
| Br-82 | 0.00e+00 | 0.00e+00 | 2.27e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.61e+03 |
| Br-83 | 0.00e+00 | 0.00e+00 | 4.04e+01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.82e+01 |
| Br-84 | 0.00e+00 | 0.00e+00 | 5.24e+01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.11e-04 |
| Br-85 | 0.00e+00 | 0.00e+00 | 2.15e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of mrem/hr per uCi/ml.

# SITE RELATED LIQUID INGESTION DOSE COMMITMENT FACTORS ($A_i$) FOR INDIVIDUAL NUCLIDES

Ai factors for Adult age group by nuclide.
Waterford Steam Electric Station Unit III
Discharge point : Circulating Water Discharge to Mississippi River
Dilution Factor DW = 220.0

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Rb-86 | 0.00e+00 | 1.01e+05 | 4.71e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.99e+04 |
| Rb-87 | 0.00e+00 | 5.89e+04 | 2.05e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.76e+03 |
| Rb-88 | 0.00e+00 | 2.90e+02 | 1.54e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.00e-09 |
| Rb-89 | 0.00e+00 | 1.92e+02 | 1.35e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.12e-11 |
| Sr-89 | 2.22e+04 | 0.00e+00 | 6.38e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.57e+03 |
| Sr-90 | 6.29e+05 | 0.00e+00 | 1.26e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.58e+04 |
| Sr-91 | 4.09e+02 | 0.00e+00 | 1.65e+01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.95e+03 |
| Sr-92 | 1.55e+02 | 0.00e+00 | 6.71e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.08e+03 |
| Y-90 | 5.79e-01 | 0.00e+00 | 1.55e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.14e+03 |
| Y-91 | 8.49e+00 | 0.00e+00 | 2.27e-01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.67e+03 |
| Y-91m | 5.47e-03 | 0.00e+00 | 2.12e-04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.61e-02 |
| Y-92 | 5.09e-02 | 0.00e+00 | 1.49e-03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 8.91e+02 |
| Y-93 | 1.61e-01 | 0.00e+00 | 4.46e-03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.12e+03 |
| Zr-93 | 3.46e-01 | 1.94e-02 | 9.02e-03 | 0.00e+00 | 7.34e-02 | 0.00e+00 | 2.01e+01 |
| Zr-95 | 2.52e-01 | 8.07e-02 | 5.46e-02 | 0.00e+00 | 1.27e-01 | 0.00e+00 | 2.56e+02 |
| Zr-97 | 1.39e-02 | 2.81e-03 | 1.28e-03 | 0.00e+00 | 4.24e-03 | 0.00e+00 | 8.69e+02 |
| Nb-93m | 1.83e+01 | 5.98e+00 | 1.47e+00 | 0.00e+00 | 6.88e+00 | 0.00e+00 | 2.76e+03 |
| Nb-95 | 4.47e+00 | 2.49e+00 | 1.34e+00 | 0.00e+00 | 2.46e+00 | 0.00e+00 | 1.51e+04 |
| Nb-97 | 3.75e-02 | 9.49e-03 | 3.46e-03 | 0.00e+00 | 1.11e-02 | 0.00e+00 | 3.50e+01 |
| Mo-93 | 0.00e+00 | 1.83e+02 | 4.94e+00 | 0.00e+00 | 5.18e+01 | 0.00e+00 | 2.97e+01 |
| Mo-99 | 0.00e+00 | 1.05e+02 | 1.99e+01 | 0.00e+00 | 2.37e+02 | 0.00e+00 | 2.43e+02 |
| Tc-101 | 9.22e-03 | 1.33e-02 | 1.30e-01 | 0.00e+00 | 2.39e-01 | 6.79e-03 | 3.99e-14 |
| Tc-99 | 4.54e+00 | 6.75e+00 | 1.82e+00 | 0.00e+00 | 8.49e+01 | 5.73e-01 | 2.21e+02 |
| Tc-99m | 8.96e-03 | 2.53e-02 | 3.23e-01 | 0.00e+00 | 3.85e-01 | 1.24e-02 | 1.50e+01 |
| Ru-103 | 4.50e+00 | 0.00e+00 | 1.94e+00 | 0.00e+00 | 1.72e+01 | 0.00e+00 | 5.25e+02 |
| Ru-105 | 3.75e-01 | 0.00e+00 | 1.48e-01 | 0.00e+00 | 4.84e+00 | 0.00e+00 | 2.29e+02 |
| Ru-106 | 6.69e+01 | 0.00e+00 | 8.46e+00 | 0.00e+00 | 1.29e+02 | 0.00e+00 | 4.33e+03 |
| Rh-105 | 2.94e+00 | 2.15e+00 | 1.42e+00 | 0.00e+00 | 9.14e+00 | 0.00e+00 | 3.43e+02 |
| Pd-107 | 0.00e+00 | 3.57e+00 | 2.29e-01 | 0.00e+00 | 3.21e+01 | 0.00e+00 | 2.22e+01 |
| Pd-109 | 0.00e+00 | 4.30e+00 | 9.70e-01 | 0.00e+00 | 2.46e+01 | 0.00e+00 | 4.77e+02 |

Conversion factors are in units of mrem/hr per uCi/ml.

Ai factors for Adult age group by nuclide.
Waterford Steam Electric Station Unit III
Discharge point : Circulating Water Discharge to Mississippi River
Dilution Factor DW = 220.0

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ag-110m | 9.42e-01 | 8.71e-01 | 5.17e-01 | 0.00e+00 | 1.71e+00 | 0.00e+00 | 3.55e+02 |
| Ag-111 | 3.42e-01 | 1.43e-01 | 7.12e-02 | 0.00e+00 | 4.61e-01 | 0.00e+00 | 2.62e+02 |
| Cd-113m | 0.00e+00 | 1.52e+03 | 4.89e+01 | 0.00e+00 | 1.68e+03 | 0.00e+00 | 1.23e+04 |
| Cd-115m | 0.00e+00 | 8.82e+02 | 2.81e+01 | 0.00e+00 | 7.00e+02 | 0.00e+00 | 3.71e+04 |
| Sn-123 | 2.23e+05 | 3.70e+03 | 5.45e+03 | 3.15e+03 | 0.00e+00 | 0.00e+00 | 4.55e+05 |
| Sn-125 | 5.98e+04 | 1.21e+03 | 2.71e+03 | 9.98e+02 | 0.00e+00 | 0.00e+00 | 7.47e+05 |
| Sn-126 | 6.07e+05 | 1.20e+04 | 1.72e+04 | 3.53e+03 | 0.00e+00 | 0.00e+00 | 1.75e+05 |
| Sb-124 | 7.76e+00 | 1.47e-01 | 3.08e+00 | 1.88e-02 | 0.00e+00 | 6.04e+00 | 2.20e+02 |
| Sb-125 | 4.96e+00 | 5.54e-02 | 1.18e+00 | 5.05e-03 | 0.00e+00 | 3.83e+00 | 5.46e+01 |
| Sb-126 | 3.19e+00 | 6.49e-02 | 1.15e+00 | 1.95e-02 | 0.00e+00 | 1.95e+00 | 2.61e+02 |
| Sb-127 | 7.15e-01 | 1.57e-02 | 2.74e-01 | 8.59e-03 | 0.00e+00 | 4.24e-01 | 1.64e+02 |
| Te-125m | 2.57e+03 | 9.30e+02 | 3.44e+02 | 7.72e+02 | 1.04e+04 | 0.00e+00 | 1.03e+04 |
| Te-127 | 1.05e+02 | 3.78e+01 | 2.28e+01 | 7.81e+01 | 4.29e+02 | 0.00e+00 | 8.32e+03 |
| Te-127m | 6.49e+03 | 2.32e+03 | 7.90e+02 | 1.66e+03 | 2.63e+04 | 0.00e+00 | 2.17e+04 |
| Te-129 | 3.01e+01 | 1.13e+01 | 7.33e+00 | 2.31e+01 | 1.26e+02 | 0.00e+00 | 2.27e+01 |
| Te-129m | 1.10e+04 | 4.11e+03 | 1.74e+03 | 3.78e+03 | 4.60e+04 | 0.00e+00 | 5.55e+04 |
| Te-131 | 1.89e+01 | 7.88e+00 | 5.96e+00 | 1.55e+01 | 8.27e+01 | 0.00e+00 | 2.67e+00 |
| Te-131m | 1.66e+03 | 8.10e+02 | 6.75e+02 | 1.28e+03 | 8.21e+03 | 0.00e+00 | 8.05e+04 |
| Te-132 | 2.41e+03 | 1.56e+03 | 1.47e+03 | 1.72e+03 | 1.50e+04 | 0.00e+00 | 7.39e+04 |
| Te-133m | 4.43e+01 | 2.59e+01 | 2.49e+01 | 3.75e+01 | 2.56e+02 | 0.00e+00 | 8.87e+00 |
| Te-134 | 3.10e+01 | 2.03e+01 | 1.25e+01 | 2.71e+01 | 1.96e+02 | 0.00e+00 | 3.44e-02 |
| I-129 | 1.19e+02 | 1.02e+02 | 3.34e+02 | 2.62e+05 | 2.19e+02 | 0.00e+00 | 1.61e+01 |
| I-130 | 2.74e+01 | 8.09e+01 | 3.19e+01 | 6.86e+03 | 1.26e+02 | 0.00e+00 | 6.97e+01 |
| I-131 | 1.51e+02 | 2.16e+02 | 1.24e+02 | 7.08e+04 | 3.70e+02 | 0.00e+00 | 5.70e+01 |
| I-132 | 7.37e+00 | 1.97e+01 | 6.89e+00 | 6.89e+02 | 3.14e+01 | 0.00e+00 | 3.70e+00 |
| I-133 | 5.15e+01 | 8.96e+01 | 2.73e+01 | 1.32e+04 | 1.56e+02 | 0.00e+00 | 8.06e+01 |
| I-134 | 3.85e+00 | 1.05e+01 | 3.74e+00 | 1.81e+02 | 1.66e+01 | 0.00e+00 | 9.11e-03 |
| I-135 | 1.61e+01 | 4.21e+01 | 1.55e+01 | 2.78e+03 | 6.75e+01 | 0.00e+00 | 4.75e+01 |
| Cs-134 | 2.98e+05 | 7.09e+05 | 5.79e+05 | 0.00e+00 | 2.29e+05 | 7.61e+04 | 1.24e+04 |
| Cs-134m | 1.02e+02 | 2.15e+02 | 1.10e+02 | 0.00e+00 | 1.16e+02 | 1.83e+01 | 7.57e+01 |

Conversion factors are in units of mrem/hr per uCi/ml.

# SITE RELATED LIQUID INGESTION DOSE COMMITMENT FACTORS ($A_i$) FOR INDIVIDUAL NUCLIDES

Ai factors for Adult age group by nuclide.
Waterford Steam Electric Station Unit III
Discharge point : Circulating Water Discharge to Mississippi River
Dilution Factor DW = 220.0

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Cs-135 | 9.34e+04 | 8.62e+04 | 3.83e+04 | 0.00e+00 | 3.26e+04 | 9.77e+03 | 2.02e+03 |
| Cs-136 | 3.12e+04 | 1.23e+05 | 8.86e+04 | 0.00e+00 | 6.85e+04 | 9.39e+03 | 1.40e+04 |
| Cs-137 | 3.82e+05 | 5.22e+05 | 3.42e+05 | 0.00e+00 | 1.77e+05 | 5.89e+04 | 1.01e+04 |
| Cs-138 | 2.64e+02 | 5.22e+02 | 2.59e+02 | 0.00e+00 | 3.84e+02 | 3.79e+01 | 2.23e-03 |
| Cs-139 | 1.63e+02 | 2.43e+02 | 8.86e+01 | 0.00e+00 | 1.95e+02 | 1.77e+01 | 5.27e-21 |
| Ba-139 | 9.66e-01 | 6.88e-04 | 2.83e-02 | 0.00e+00 | 6.43e-04 | 3.90e-04 | 1.71e+00 |
| Ba-140 | 2.02e+02 | 2.54e-01 | 1.32e+01 | 0.00e+00 | 8.63e-02 | 1.45e-01 | 4.16e+02 |
| Ba-141 | 4.69e-01 | 3.54e-04 | 1.58e-02 | 0.00e+00 | 3.29e-04 | 2.01e-04 | 2.21e-10 |
| Ba-142 | 2.12e-01 | 2.18e-04 | 1.33e-02 | 0.00e+00 | 1.84e-04 | 1.23e-04 | 2.99e-19 |
| La-140 | 1.51e-01 | 7.59e-02 | 2.01e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.57e+03 |
| La-141 | 1.92e-02 | 5.96e-03 | 9.76e-04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.11e+02 |
| La-142 | 7.71e-03 | 3.51e-03 | 8.73e-04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.56e+01 |
| Ce-141 | 2.59e-02 | 1.75e-02 | 1.99e-03 | 0.00e+00 | 8.15e-03 | 0.00e+00 | 6.71e+01 |
| Ce-143 | 4.57e-03 | 3.38e+00 | 3.74e-04 | 0.00e+00 | 1.49e-03 | 0.00e+00 | 1.26e+02 |
| Ce-144 | 1.35e+00 | 5.66e-01 | 7.26e-02 | 0.00e+00 | 3.35e-01 | 0.00e+00 | 4.57e+02 |
| Pr-143 | 5.54e-01 | 2.22e-01 | 2.75e-02 | 0.00e+00 | 1.28e-01 | 0.00e+00 | 2.43e+03 |
| Pr-144 | 1.81e-03 | 7.53e-04 | 9.21e-05 | 0.00e+00 | 4.25e-04 | 0.00e+00 | 2.61e-10 |
| Nd-147 | 3.79e-01 | 4.38e-01 | 2.62e-02 | 0.00e+00 | 2.56e-01 | 0.00e+00 | 2.10e+03 |
| Pm-147 | 4.54e+00 | 4.27e-01 | 1.73e-01 | 0.00e+00 | 8.07e-01 | 0.00e+00 | 5.38e+02 |
| Pm-148 | 4.32e-01 | 7.17e-02 | 3.61e-02 | 0.00e+00 | 1.36e-01 | 0.00e+00 | 5.63e+03 |
| Pm-148m | 1.85e+00 | 4.79e-01 | 3.66e-01 | 0.00e+00 | 7.23e-01 | 0.00e+00 | 4.06e+03 |
| Pm-149 | 9.15e-02 | 1.29e-02 | 5.29e-03 | 0.00e+00 | 2.45e-02 | 0.00e+00 | 2.43e+03 |
| Pm-151 | 4.20e-02 | 7.05e-03 | 3.56e-03 | 0.00e+00 | 1.26e-02 | 0.00e+00 | 1.94e+03 |
| Sm-151 | 4.16e+00 | 7.17e-01 | 1.72e-01 | 0.00e+00 | 8.01e-01 | 0.00e+00 | 3.16e+02 |
| Sm-153 | 5.16e-02 | 4.31e-02 | 3.14e-03 | 0.00e+00 | 1.39e-02 | 0.00e+00 | 1.54e+03 |
| Eu-152 | 1.17e+01 | 2.67e+00 | 2.35e+00 | 0.00e+00 | 1.66e+01 | 0.00e+00 | 1.54e+03 |
| Eu-154 | 3.70e+01 | 4.55e+00 | 3.24e+00 | 0.00e+00 | 2.18e+01 | 0.00e+00 | 3.30e+03 |
| Eu-155 | 5.18e+00 | 7.35e-01 | 4.74e-01 | 0.00e+00 | 3.39e+00 | 0.00e+00 | 5.78e+02 |
| Eu-156 | 8.25e-01 | 6.38e-01 | 1.03e-01 | 0.00e+00 | 4.26e-01 | 0.00e+00 | 4.37e+03 |
| Tb-160 | 2.83e+00 | 0.00e+00 | 3.53e-01 | 0.00e+00 | 1.17e+00 | 0.00e+00 | 2.61e+03 |

Conversion factors are in units of mrem/hr per uCi/ml.

Ai factors for Adult age group by nuclide.
Waterford Steam Electric Station Unit III
Discharge point : Circulating Water Discharge to Mississippi River
Dilution Factor DW = 220.0

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ho-166m | 1.63e+01 | 5.08e+00 | 3.85e+00 | 0.00e+00 | 7.59e+00 | 0.00e+00 | 1.54e+03 |
| W-181 | 2.85e+01 | 9.28e+00 | 9.94e-01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.06e+03 |
| W-185 | 1.16e+03 | 3.88e+02 | 4.08e+01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.48e+04 |
| W-187 | 2.96e+02 | 2.47e+02 | 8.65e+01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 8.10e+04 |
| Pb-210 | 3.67e+06 | 1.05e+06 | 1.30e+05 | 0.00e+00 | 2.95e+06 | 0.00e+00 | 5.37e+02 |
| Bi-210 | 1.67e+01 | 1.15e+02 | 9.58e+00 | 0.00e+00 | 1.39e+03 | 0.00e+00 | 1.72e+03 |
| Po-210 | 4.26e+05 | 9.05e+05 | 1.03e+05 | 0.00e+00 | 3.02e+06 | 0.00e+00 | 7.62e+04 |
| Ra-223 | 5.97e+05 | 9.19e+02 | 1.19e+05 | 0.00e+00 | 2.61e+04 | 0.00e+00 | 3.85e+04 |
| Ra-224 | 1.93e+05 | 4.68e+02 | 3.88e+04 | 0.00e+00 | 1.32e+04 | 0.00e+00 | 4.08e+04 |
| Ra-225 | 7.88e+05 | 9.34e+02 | 1.57e+05 | 0.00e+00 | 2.65e+04 | 0.00e+00 | 3.67e+04 |
| Ra-226 | 3.63e+07 | 6.89e+02 | 2.64e+07 | 0.00e+00 | 1.96e+04 | 0.00e+00 | 3.99e+04 |
| Ra-228 | 1.34e+07 | 3.75e+02 | 1.45e+07 | 0.00e+00 | 1.06e+04 | 0.00e+00 | 6.77e+03 |
| Ac-225 | 2.65e+02 | 3.65e+02 | 1.78e+01 | 0.00e+00 | 4.16e+01 | 0.00e+00 | 2.45e+04 |
| Ac-227 | 1.13e+05 | 1.49e+04 | 6.69e+03 | 0.00e+00 | 4.82e+03 | 0.00e+00 | 4.93e+03 |
| Th-227 | 9.89e+02 | 1.79e+01 | 2.85e+01 | 0.00e+00 | 1.02e+02 | 0.00e+00 | 3.90e+04 |
| Th-228 | 3.58e+04 | 6.06e+02 | 1.21e+03 | 0.00e+00 | 3.37e+03 | 0.00e+00 | 4.06e+04 |
| Th-229 | 9.82e+05 | 2.81e+04 | 1.62e+04 | 0.00e+00 | 1.36e+05 | 0.00e+00 | 5.64e+03 |
| Th-230 | 1.49e+05 | 8.45e+03 | 4.12e+03 | 0.00e+00 | 4.08e+04 | 0.00e+00 | 4.35e+03 |
| Th-232 | 1.66e+05 | 7.22e+03 | 1.08e+02 | 0.00e+00 | 3.48e+04 | 0.00e+00 | 3.70e+03 |
| Th-234 | 5.78e+00 | 3.40e-01 | 1.67e-01 | 0.00e+00 | 1.93e+00 | 0.00e+00 | 8.16e+03 |
| Pa-231 | 1.10e+05 | 4.11e+03 | 4.25e+03 | 0.00e+00 | 2.31e+04 | 0.00e+00 | 1.92e+03 |
| Pa-233 | 1.41e-01 | 2.83e-02 | 2.44e-02 | 0.00e+00 | 1.07e-01 | 0.00e+00 | 4.38e+02 |
| U-232 | 2.13e+04 | 0.00e+00 | 1.52e+03 | 0.00e+00 | 2.31e+03 | 0.00e+00 | 3.50e+02 |
| U-233 | 4.50e+03 | 0.00e+00 | 2.73e+02 | 0.00e+00 | 1.05e+03 | 0.00e+00 | 3.24e+02 |
| U-234 | 4.32e+03 | 0.00e+00 | 2.67e+02 | 0.00e+00 | 1.03e+03 | 0.00e+00 | 3.17e+02 |
| U-235 | 4.14e+03 | 0.00e+00 | 2.51e+02 | 0.00e+00 | 9.66e+02 | 0.00e+00 | 4.03e+02 |
| U-236 | 4.14e+03 | 0.00e+00 | 2.56e+02 | 0.00e+00 | 9.87e+02 | 0.00e+00 | 2.98e+02 |
| U-237 | 2.85e-01 | 0.00e+00 | 7.59e-02 | 0.00e+00 | 1.17e+00 | 0.00e+00 | 1.00e+02 |
| U-238 | 3.96e+03 | 0.00e+00 | 2.35e+02 | 0.00e+00 | 9.04e+02 | 0.00e+00 | 2.84e+02 |
| Np-237 | 3.06e+04 | 2.18e+03 | 1.35e+03 | 0.00e+00 | 1.00e+04 | 0.00e+00 | 1.93e+03 |

Conversion factors are in units of mrem/hr per uCi/ml.

Ai factors for Adult age group by nuclide.
Waterford Steam Electric Station Unit III
Discharge point : Circulating Water Discharge to Mississippi River
Dilution Factor DW = 220.0

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Np-238 | 3.33e-01 | 8.97e-03 | 5.18e-03 | 0.00e+00 | 3.04e-02 | 0.00e+00 | 8.34e+02 |
| Np-239 | 2.89e-02 | 2.85e-03 | 1.57e-03 | 0.00e+00 | 8.88e-03 | 0.00e+00 | 5.84e+02 |
| Pu-238 | 5.52e+03 | 6.99e+02 | 1.50e+02 | 0.00e+00 | 6.41e+02 | 0.00e+00 | 6.39e+02 |
| Pu-239 | 6.35e+03 | 7.63e+02 | 1.67e+02 | 0.00e+00 | 7.10e+02 | 0.00e+00 | 5.83e+02 |
| Pu-240 | 6.34e+03 | 7.62e+02 | 1.67e+02 | 0.00e+00 | 7.09e+02 | 0.00e+00 | 5.94e+02 |
| Pu-241 | 1.37e+02 | 6.52e+00 | 2.91e+00 | 0.00e+00 | 1.34e+01 | 0.00e+00 | 1.23e+01 |
| Pu-242 | 5.88e+03 | 7.35e+02 | 1.61e+02 | 0.00e+00 | 6.84e+02 | 0.00e+00 | 5.72e+02 |
| Pu-244 | 6.87e+03 | 8.42e+02 | 1.85e+02 | 0.00e+00 | 7.84e+02 | 0.00e+00 | 8.52e+02 |
| Am-241 | 4.55e+04 | 4.25e+04 | 3.26e+03 | 0.00e+00 | 2.45e+04 | 0.00e+00 | 4.47e+03 |
| Am-242m | 4.58e+04 | 3.99e+04 | 3.27e+03 | 0.00e+00 | 2.44e+04 | 0.00e+00 | 5.63e+03 |
| Am-243 | 4.54e+04 | 4.16e+04 | 3.19e+03 | 0.00e+00 | 2.40e+04 | 0.00e+00 | 5.24e+03 |
| Cm-242 | 1.24e+03 | 1.32e+03 | 8.25e+01 | 0.00e+00 | 3.75e+02 | 0.00e+00 | 4.77e+03 |
| Cm-243 | 3.61e+04 | 3.31e+04 | 2.26e+03 | 0.00e+00 | 1.05e+04 | 0.00e+00 | 4.70e+03 |
| Cm-244 | 2.75e+04 | 2.57e+04 | 1.73e+03 | 0.00e+00 | 8.07e+03 | 0.00e+00 | 4.55e+03 |
| Cm-245 | 5.65e+04 | 4.92e+04 | 3.47e+03 | 0.00e+00 | 1.62e+04 | 0.00e+00 | 4.24e+03 |
| Cm-246 | 5.60e+04 | 4.91e+04 | 3.46e+03 | 0.00e+00 | 1.61e+04 | 0.00e+00 | 4.16e+03 |
| Cm-247 | 5.46e+04 | 4.84e+04 | 3.41e+03 | 0.00e+00 | 1.59e+04 | 0.00e+00 | 5.47e+03 |
| Cm-248 | 4.54e+05 | 3.99e+05 | 2.81e+04 | 0.00e+00 | 1.31e+05 | 0.00e+00 | 8.85e+04 |
| Cf-252 | 1.57e+04 | 0.00e+00 | 3.79e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.73e+04 |

Conversion factors are in units of mrem/hr per uCi/ml.

Ai factors for Adult age group by nuclide.
Waterford Steam Electric Station Unit III
Discharge point : 40 Arpent Canal
Dilution Factor DW = 1.0

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| H-3 | 0.00e+00 | 1.29e-01 | 1.29e-01 | 1.29e-01 | 1.29e-01 | 1.29e-01 | 1.29e-01 |
| Be-10 | 1.52e+01 | 2.35e+00 | 3.80e-01 | 0.00e+00 | 1.78e+00 | 0.00e+00 | 1.28e+02 |
| C-14 | 3.13e+04 | 6.26e+03 | 6.26e+03 | 6.26e+03 | 6.26e+03 | 6.26e+03 | 6.26e+03 |
| N-13 | 3.00e+03 | 3.00e+03 | 3.00e+03 | 3.00e+03 | 3.00e+03 | 3.00e+03 | 3.00e+03 |
| F-18 | 1.49e+01 | 0.00e+00 | 1.66e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.43e-01 |
| Na-22 | 4.17e+03 | 4.17e+03 | 4.17e+03 | 4.17e+03 | 4.17e+03 | 4.17e+03 | 4.17e+03 |
| Na-24 | 4.07e+02 | 4.07e+02 | 4.07e+02 | 4.07e+02 | 4.07e+02 | 4.07e+02 | 4.07e+02 |
| P-32 | 4.62e+07 | 2.87e+06 | 1.79e+06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.19e+06 |
| Ca-41 | 1.77e+04 | 0.00e+00 | 1.92e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.76e+01 |
| Sc-46 | 2.64e-02 | 5.12e-02 | 1.49e-02 | 0.00e+00 | 4.78e-02 | 0.00e+00 | 2.49e+02 |
| Cr-51 | 0.00e+00 | 0.00e+00 | 1.27e+00 | 7.61e-01 | 2.81e-01 | 1.69e+00 | 3.20e+02 |
| Mn-54 | 0.00e+00 | 4.38e+03 | 8.35e+02 | 0.00e+00 | 1.30e+03 | 0.00e+00 | 1.34e+04 |
| Mn-56 | 0.00e+00 | 1.10e+02 | 1.95e+01 | 0.00e+00 | 1.40e+02 | 0.00e+00 | 3.51e+03 |
| Fe-55 | 6.58e+02 | 4.55e+02 | 1.06e+02 | 0.00e+00 | 0.00e+00 | 2.54e+02 | 2.61e+02 |
| Fe-59 | 1.04e+03 | 2.44e+03 | 9.36e+02 | 0.00e+00 | 0.00e+00 | 6.82e+02 | 8.14e+03 |
| Co-57 | 0.00e+00 | 2.09e+01 | 3.48e+01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.31e+02 |
| Co-58 | 0.00e+00 | 8.92e+01 | 2.00e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.81e+03 |
| Co-60 | 0.00e+00 | 2.56e+02 | 5.65e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.81e+03 |
| Ni-59 | 2.34e+03 | 8.02e+02 | 3.90e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.65e+02 |
| Ni-63 | 3.11e+04 | 2.16e+03 | 1.04e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.50e+02 |
| Ni-65 | 1.26e+02 | 1.64e+01 | 7.49e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.17e+02 |
| Cu-64 | 0.00e+00 | 9.97e+00 | 4.68e+00 | 0.00e+00 | 2.51e+01 | 0.00e+00 | 8.50e+02 |
| Zn-65 | 2.32e+04 | 7.37e+04 | 3.33e+04 | 0.00e+00 | 4.93e+04 | 0.00e+00 | 4.64e+04 |
| Zn-69 | 4.93e+01 | 9.43e+01 | 6.56e+00 | 0.00e+00 | 6.13e+01 | 0.00e+00 | 1.42e+01 |
| Zn-69m | 8.14e+02 | 1.95e+03 | 1.79e+02 | 0.00e+00 | 1.18e+03 | 0.00e+00 | 1.19e+05 |
| Se-79 | 0.00e+00 | 1.07e+03 | 1.79e+02 | 0.00e+00 | 1.85e+03 | 0.00e+00 | 2.19e+02 |
| Br-82 | 0.00e+00 | 0.00e+00 | 2.27e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.60e+03 |
| Br-83 | 0.00e+00 | 0.00e+00 | 4.04e+01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.82e+01 |
| Br-84 | 0.00e+00 | 0.00e+00 | 5.24e+01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.11e-04 |
| Br-85 | 0.00e+00 | 0.00e+00 | 2.15e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of mrem/hr per uCi/ml.

# SITE RELATED LIQUID INGESTION DOSE COMMITMENT FACTORS ($A_i$) FOR INDIVIDUAL NUCLIDES

Ai factors for Adult age group by nuclide.
Waterford Steam Electric Station Unit III
Discharge point : 40 Arpent Canal
Dilution Factor DW = 1.0

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Rb-86 | 0.00e+00 | 1.01e+05 | 4.71e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.99e+04 |
| Rb-87 | 0.00e+00 | 5.89e+04 | 2.05e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.76e+03 |
| Rb-88 | 0.00e+00 | 2.90e+02 | 1.54e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.00e-09 |
| Rb-89 | 0.00e+00 | 1.92e+02 | 1.35e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.12e-11 |
| Sr-89 | 2.21e+04 | 0.00e+00 | 6.35e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.55e+03 |
| Sr-90 | 6.26e+05 | 0.00e+00 | 1.26e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.57e+04 |
| Sr-91 | 4.07e+02 | 0.00e+00 | 1.64e+01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.94e+03 |
| Sr-92 | 1.54e+02 | 0.00e+00 | 6.68e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.06e+03 |
| Y-90 | 5.76e-01 | 0.00e+00 | 1.54e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.10e+03 |
| Y-91 | 8.44e+00 | 0.00e+00 | 2.26e-01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.64e+03 |
| Y-91m | 5.44e-03 | 0.00e+00 | 2.11e-04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.60e-02 |
| Y-92 | 5.06e-02 | 0.00e+00 | 1.48e-03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 8.86e+02 |
| Y-93 | 1.60e-01 | 0.00e+00 | 4.43e-03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.09e+03 |
| Zr-93 | 3.30e-01 | 1.85e-02 | 8.61e-03 | 0.00e+00 | 7.01e-02 | 0.00e+00 | 1.92e+01 |
| Zr-95 | 2.40e-01 | 7.70e-02 | 5.21e-02 | 0.00e+00 | 1.21e-01 | 0.00e+00 | 2.44e+02 |
| Zr-97 | 1.33e-02 | 2.68e-03 | 1.22e-03 | 0.00e+00 | 4.04e-03 | 0.00e+00 | 8.30e+02 |
| Nb-93m | 1.83e+01 | 5.98e+00 | 1.47e+00 | 0.00e+00 | 6.87e+00 | 0.00e+00 | 2.76e+03 |
| Nb-95 | 4.47e+00 | 2.48e+00 | 1.34e+00 | 0.00e+00 | 2.46e+00 | 0.00e+00 | 1.51e+04 |
| Nb-97 | 3.75e-02 | 9.48e-03 | 3.46e-03 | 0.00e+00 | 1.11e-02 | 0.00e+00 | 3.50e+01 |
| Mo-93 | 0.00e+00 | 1.80e+02 | 4.86e+00 | 0.00e+00 | 5.10e+01 | 0.00e+00 | 2.92e+01 |
| Mo-99 | 0.00e+00 | 1.03e+02 | 1.96e+01 | 0.00e+00 | 2.34e+02 | 0.00e+00 | 2.39e+02 |
| Tc-101 | 9.12e-03 | 1.31e-02 | 1.29e-01 | 0.00e+00 | 2.37e-01 | 6.72e-03 | 3.95e-14 |
| Tc-99 | 4.49e+00 | 6.68e+00 | 1.80e+00 | 0.00e+00 | 8.40e+01 | 5.67e-01 | 2.18e+02 |
| Tc-99m | 8.87e-03 | 2.51e-02 | 3.19e-01 | 0.00e+00 | 3.81e-01 | 1.23e-02 | 1.48e+01 |
| Ru-103 | 4.43e+00 | 0.00e+00 | 1.91e+00 | 0.00e+00 | 1.69e+01 | 0.00e+00 | 5.17e+02 |
| Ru-105 | 3.69e-01 | 0.00e+00 | 1.46e-01 | 0.00e+00 | 4.76e+00 | 0.00e+00 | 2.26e+02 |
| Ru-106 | 6.58e+01 | 0.00e+00 | 8.33e+00 | 0.00e+00 | 1.27e+02 | 0.00e+00 | 4.26e+03 |
| Rh-105 | 2.90e+00 | 2.12e+00 | 1.40e+00 | 0.00e+00 | 9.00e+00 | 0.00e+00 | 3.38e+02 |
| Pd-107 | 0.00e+00 | 3.52e+00 | 2.25e-01 | 0.00e+00 | 3.16e+01 | 0.00e+00 | 2.18e+01 |
| Pd-109 | 0.00e+00 | 4.24e+00 | 9.55e-01 | 0.00e+00 | 2.42e+01 | 0.00e+00 | 4.69e+02 |

Conversion factors are in units of mrem/hr per uCi/ml.

Ai factors for Adult age group by nuclide.
Waterford Steam Electric Station Unit III
Discharge point : 40 Arpent Canal
Dilution Factor DW = 1.0

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ag-110m | 8.81e-01 | 8.15e-01 | 4.84e-01 | 0.00e+00 | 1.60e+00 | 0.00e+00 | 3.33e+02 |
| Ag-111 | 3.20e-01 | 1.34e-01 | 6.66e-02 | 0.00e+00 | 4.32e-01 | 0.00e+00 | 2.46e+02 |
| Cd-113m | 0.00e+00 | 1.52e+03 | 4.88e+01 | 0.00e+00 | 1.68e+03 | 0.00e+00 | 1.23e+04 |
| Cd-115m | 0.00e+00 | 8.81e+02 | 2.81e+01 | 0.00e+00 | 6.99e+02 | 0.00e+00 | 3.71e+04 |
| Sn-123 | 2.23e+05 | 3.70e+03 | 5.45e+03 | 3.15e+03 | 0.00e+00 | 0.00e+00 | 4.55e+05 |
| Sn-125 | 5.98e+04 | 1.21e+03 | 2.71e+03 | 9.98e+02 | 0.00e+00 | 0.00e+00 | 7.47e+05 |
| Sn-126 | 6.07e+05 | 1.20e+04 | 1.72e+04 | 3.53e+03 | 0.00e+00 | 0.00e+00 | 1.75e+05 |
| Sb-124 | 6.70e+00 | 1.27e-01 | 2.66e+00 | 1.63e-02 | 0.00e+00 | 5.22e+00 | 1.90e+02 |
| Sb-125 | 4.29e+00 | 4.79e-02 | 1.02e+00 | 4.36e-03 | 0.00e+00 | 3.30e+00 | 4.72e+01 |
| Sb-126 | 2.75e+00 | 5.60e-02 | 9.94e-01 | 1.69e-02 | 0.00e+00 | 1.69e+00 | 2.25e+02 |
| Sb-127 | 6.18e-01 | 1.35e-02 | 2.37e-01 | 7.42e-03 | 0.00e+00 | 3.66e-01 | 1.41e+02 |
| Te-125m | 2.57e+03 | 9.30e+02 | 3.44e+02 | 7.72e+02 | 1.04e+04 | 0.00e+00 | 1.02e+04 |
| Te-127 | 1.05e+02 | 3.78e+01 | 2.28e+01 | 7.80e+01 | 4.29e+02 | 0.00e+00 | 8.31e+03 |
| Te-127m | 6.48e+03 | 2.32e+03 | 7.90e+02 | 1.66e+03 | 2.63e+04 | 0.00e+00 | 2.17e+04 |
| Te-129 | 3.01e+01 | 1.13e+01 | 7.33e+00 | 2.31e+01 | 1.26e+02 | 0.00e+00 | 2.27e+01 |
| Te-129m | 1.10e+04 | 4.11e+03 | 1.74e+03 | 3.78e+03 | 4.60e+04 | 0.00e+00 | 5.54e+04 |
| Te-131 | 1.89e+01 | 7.88e+00 | 5.96e+00 | 1.55e+01 | 8.26e+01 | 0.00e+00 | 2.67e+00 |
| Te-131m | 1.66e+03 | 8.10e+02 | 6.75e+02 | 1.28e+03 | 8.21e+03 | 0.00e+00 | 8.04e+04 |
| Te-132 | 2.41e+03 | 1.56e+03 | 1.47e+03 | 1.72e+03 | 1.50e+04 | 0.00e+00 | 7.38e+04 |
| Te-133m | 4.42e+01 | 2.59e+01 | 2.49e+01 | 3.74e+01 | 2.56e+02 | 0.00e+00 | 8.87e+00 |
| Te-134 | 3.10e+01 | 2.03e+01 | 1.24e+01 | 2.71e+01 | 1.96e+02 | 0.00e+00 | 3.44e-02 |
| I-129 | 1.17e+02 | 1.01e+02 | 3.31e+02 | 2.60e+05 | 2.17e+02 | 0.00e+00 | 1.59e+01 |
| I-130 | 2.71e+01 | 8.01e+01 | 3.16e+01 | 6.79e+03 | 1.25e+02 | 0.00e+00 | 6.89e+01 |
| I-131 | 1.49e+02 | 2.14e+02 | 1.22e+02 | 7.00e+04 | 3.66e+02 | 0.00e+00 | 5.64e+01 |
| I-132 | 7.29e+00 | 1.95e+01 | 6.82e+00 | 6.82e+02 | 3.11e+01 | 0.00e+00 | 3.66e+00 |
| I-133 | 5.10e+01 | 8.87e+01 | 2.70e+01 | 1.30e+04 | 1.55e+02 | 0.00e+00 | 7.97e+01 |
| I-134 | 3.81e+00 | 1.03e+01 | 3.70e+00 | 1.79e+02 | 1.64e+01 | 0.00e+00 | 9.01e-03 |
| I-135 | 1.59e+01 | 4.17e+01 | 1.54e+01 | 2.75e+03 | 6.68e+01 | 0.00e+00 | 4.70e+01 |
| Cs-134 | 2.98e+05 | 7.09e+05 | 5.79e+05 | 0.00e+00 | 2.29e+05 | 7.61e+04 | 1.24e+04 |
| Cs-134m | 1.02e+02 | 2.15e+02 | 1.10e+02 | 0.00e+00 | 1.16e+02 | 1.83e+01 | 7.57e+01 |

Conversion factors are in units of mrem/hr per uCi/ml.

Ai factors for Adult age group by nuclide.
Waterford Steam Electric Station Unit III
Discharge point : 40 Arpent Canal
Dilution Factor DW = 1.0

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Cs-135 | 9.34e+04 | 8.62e+04 | 3.83e+04 | 0.00e+00 | 3.26e+04 | 9.77e+03 | 2.02e+03 |
| Cs-136 | 3.12e+04 | 1.23e+05 | 8.86e+04 | 0.00e+00 | 6.85e+04 | 9.38e+03 | 1.40e+04 |
| Cs-137 | 3.82e+05 | 5.22e+05 | 3.42e+05 | 0.00e+00 | 1.77e+05 | 5.89e+04 | 1.01e+04 |
| Cs-138 | 2.64e+02 | 5.22e+02 | 2.59e+02 | 0.00e+00 | 3.84e+02 | 3.79e+01 | 2.23e-03 |
| Cs-139 | 1.63e+02 | 2.43e+02 | 8.86e+01 | 0.00e+00 | 1.95e+02 | 1.77e+01 | 5.27e-21 |
| Ba-139 | 9.29e-01 | 6.62e-04 | 2.72e-02 | 0.00e+00 | 6.19e-04 | 3.75e-04 | 1.65e+00 |
| Ba-140 | 1.94e+02 | 2.44e-01 | 1.27e+01 | 0.00e+00 | 8.30e-02 | 1.40e-01 | 4.00e+02 |
| Ba-141 | 4.51e-01 | 3.41e-04 | 1.52e-02 | 0.00e+00 | 3.17e-04 | 1.93e-04 | 2.13e-10 |
| Ba-142 | 2.04e-01 | 2.10e-04 | 1.28e-02 | 0.00e+00 | 1.77e-04 | 1.19e-04 | 2.87e-19 |
| La-140 | 1.50e-01 | 7.54e-02 | 1.99e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.54e+03 |
| La-141 | 1.91e-02 | 5.93e-03 | 9.70e-04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.06e+02 |
| La-142 | 7.66e-03 | 3.48e-03 | 8.68e-04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.54e+01 |
| Ce-141 | 2.24e-02 | 1.52e-02 | 1.72e-03 | 0.00e+00 | 7.04e-03 | 0.00e+00 | 5.79e+01 |
| Ce-143 | 3.95e-03 | 2.92e+00 | 3.23e-04 | 0.00e+00 | 1.29e-03 | 0.00e+00 | 1.09e+02 |
| Ce-144 | 1.17e+00 | 4.88e-01 | 6.27e-02 | 0.00e+00 | 2.90e-01 | 0.00e+00 | 3.95e+02 |
| Pr-143 | 5.51e-01 | 2.21e-01 | 2.73e-02 | 0.00e+00 | 1.27e-01 | 0.00e+00 | 2.41e+03 |
| Pr-144 | 1.80e-03 | 7.48e-04 | 9.16e-05 | 0.00e+00 | 4.22e-04 | 0.00e+00 | 2.59e-10 |
| Nd-147 | 3.76e-01 | 4.35e-01 | 2.60e-02 | 0.00e+00 | 2.54e-01 | 0.00e+00 | 2.09e+03 |
| Pm-147 | 4.51e+00 | 4.24e-01 | 1.72e-01 | 0.00e+00 | 8.02e-01 | 0.00e+00 | 5.34e+02 |
| Pm-148 | 4.29e-01 | 7.12e-02 | 3.59e-02 | 0.00e+00 | 1.35e-01 | 0.00e+00 | 5.60e+03 |
| Pm-148m | 1.84e+00 | 4.76e-01 | 3.64e-01 | 0.00e+00 | 7.18e-01 | 0.00e+00 | 4.03e+03 |
| Pm-149 | 9.10e-02 | 1.29e-02 | 5.25e-03 | 0.00e+00 | 2.43e-02 | 0.00e+00 | 2.41e+03 |
| Pm-151 | 4.17e-02 | 7.00e-03 | 3.54e-03 | 0.00e+00 | 1.25e-02 | 0.00e+00 | 1.93e+03 |
| Sm-151 | 4.13e+00 | 7.12e-01 | 1.71e-01 | 0.00e+00 | 7.96e-01 | 0.00e+00 | 3.14e+02 |
| Sm-153 | 5.13e-02 | 4.28e-02 | 3.12e-03 | 0.00e+00 | 1.38e-02 | 0.00e+00 | 1.53e+03 |
| Eu-152 | 1.17e+01 | 2.66e+00 | 2.33e+00 | 0.00e+00 | 1.65e+01 | 0.00e+00 | 1.53e+03 |
| Eu-154 | 3.68e+01 | 4.52e+00 | 3.22e+00 | 0.00e+00 | 2.17e+01 | 0.00e+00 | 3.28e+03 |
| Eu-155 | 5.15e+00 | 7.30e-01 | 4.71e-01 | 0.00e+00 | 3.37e+00 | 0.00e+00 | 5.75e+02 |
| Eu-156 | 8.20e-01 | 6.34e-01 | 1.02e-01 | 0.00e+00 | 4.24e-01 | 0.00e+00 | 4.35e+03 |
| Tb-160 | 2.81e+00 | 0.00e+00 | 3.51e-01 | 0.00e+00 | 1.16e+00 | 0.00e+00 | 2.59e+03 |

Conversion factors are in units of mrem/hr per uCi/ml.

Ai factors for Adult age group by nuclide.
Waterford Steam Electric Station Unit III
Discharge point : 40 Arpent Canal
Dilution Factor DW = 1.0

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ho-166m | 1.62e+01 | 5.05e+00 | 3.83e+00 | 0.00e+00 | 7.54e+00 | 0.00e+00 | 1.53e+03 |
| W-181 | 2.85e+01 | 9.28e+00 | 9.94e-01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.06e+03 |
| W-185 | 1.16e+03 | 3.88e+02 | 4.08e+01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.48e+04 |
| W-187 | 2.96e+02 | 2.47e+02 | 8.65e+01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 8.10e+04 |
| Pb-210 | 3.66e+06 | 1.05e+06 | 1.30e+05 | 0.00e+00 | 2.94e+06 | 0.00e+00 | 5.36e+02 |
| Bi-210 | 1.66e+01 | 1.14e+02 | 9.48e+00 | 0.00e+00 | 1.38e+03 | 0.00e+00 | 1.71e+03 |
| Po-210 | 4.26e+05 | 9.05e+05 | 1.03e+05 | 0.00e+00 | 3.02e+06 | 0.00e+00 | 7.61e+04 |
| Ra-223 | 5.95e+05 | 9.16e+02 | 1.19e+05 | 0.00e+00 | 2.60e+04 | 0.00e+00 | 3.84e+04 |
| Ra-224 | 1.93e+05 | 4.67e+02 | 3.87e+04 | 0.00e+00 | 1.32e+04 | 0.00e+00 | 4.07e+04 |
| Ra-225 | 7.85e+05 | 9.31e+02 | 1.57e+05 | 0.00e+00 | 2.65e+04 | 0.00e+00 | 3.66e+04 |
| Ra-226 | 3.61e+07 | 6.87e+02 | 2.63e+07 | 0.00e+00 | 1.95e+04 | 0.00e+00 | 3.97e+04 |
| Ra-228 | 1.34e+07 | 3.73e+02 | 1.45e+07 | 0.00e+00 | 1.06e+04 | 0.00e+00 | 6.75e+03 |
| Ac-225 | 2.63e+02 | 3.63e+02 | 1.77e+01 | 0.00e+00 | 4.13e+01 | 0.00e+00 | 2.44e+04 |
| Ac-227 | 1.12e+05 | 1.48e+04 | 6.64e+03 | 0.00e+00 | 4.79e+03 | 0.00e+00 | 4.90e+03 |
| Th-227 | 9.84e+02 | 1.78e+01 | 2.84e+01 | 0.00e+00 | 1.01e+02 | 0.00e+00 | 3.88e+04 |
| Th-228 | 3.56e+04 | 6.03e+02 | 1.21e+03 | 0.00e+00 | 3.35e+03 | 0.00e+00 | 4.04e+04 |
| Th-229 | 9.77e+05 | 2.79e+04 | 1.62e+04 | 0.00e+00 | 1.35e+05 | 0.00e+00 | 5.61e+03 |
| Th-230 | 1.48e+05 | 8.40e+03 | 4.09e+03 | 0.00e+00 | 4.06e+04 | 0.00e+00 | 4.32e+03 |
| Th-232 | 1.65e+05 | 7.18e+03 | 1.08e+02 | 0.00e+00 | 3.46e+04 | 0.00e+00 | 3.68e+03 |
| Th-234 | 5.75e+00 | 3.38e-01 | 1.66e-01 | 0.00e+00 | 1.92e+00 | 0.00e+00 | 8.12e+03 |
| Pa-231 | 1.08e+05 | 4.06e+03 | 4.19e+03 | 0.00e+00 | 2.28e+04 | 0.00e+00 | 1.89e+03 |
| Pa-233 | 1.39e-01 | 2.79e-02 | 2.40e-02 | 0.00e+00 | 1.05e-01 | 0.00e+00 | 4.32e+02 |
| U-232 | 1.98e+04 | 0.00e+00 | 1.41e+03 | 0.00e+00 | 2.14e+03 | 0.00e+00 | 3.25e+02 |
| U-233 | 4.17e+03 | 0.00e+00 | 2.53e+02 | 0.00e+00 | 9.72e+02 | 0.00e+00 | 3.00e+02 |
| U-234 | 4.00e+03 | 0.00e+00 | 2.48e+02 | 0.00e+00 | 9.53e+02 | 0.00e+00 | 2.94e+02 |
| U-235 | 3.84e+03 | 0.00e+00 | 2.33e+02 | 0.00e+00 | 8.95e+02 | 0.00e+00 | 3.74e+02 |
| U-236 | 3.84e+03 | 0.00e+00 | 2.37e+02 | 0.00e+00 | 9.15e+02 | 0.00e+00 | 2.76e+02 |
| U-237 | 2.64e-01 | 0.00e+00 | 7.04e-02 | 0.00e+00 | 1.09e+00 | 0.00e+00 | 9.29e+01 |
| U-238 | 3.67e+03 | 0.00e+00 | 2.17e+02 | 0.00e+00 | 8.38e+02 | 0.00e+00 | 2.63e+02 |
| Np-237 | 3.02e+04 | 2.15e+03 | 1.33e+03 | 0.00e+00 | 9.86e+03 | 0.00e+00 | 1.90e+03 |

Conversion factors are in units of mrem/hr per uCi/ml.

Ai factors for Adult age group by nuclide.
Waterford Steam Electric Station Unit III
Discharge point : 40 Arpent Canal
Dilution Factor DW = 1.0

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Np-238 | 3.28e-01 | 8.83e-03 | 5.10e-03 | 0.00e+00 | 2.99e-02 | 0.00e+00 | 8.21e+02 |
| Np-239 | 2.85e-02 | 2.80e-03 | 1.54e-03 | 0.00e+00 | 8.74e-03 | 0.00e+00 | 5.75e+02 |
| Pu-238 | 5.28e+03 | 6.69e+02 | 1.43e+02 | 0.00e+00 | 6.13e+02 | 0.00e+00 | 6.12e+02 |
| Pu-239 | 6.07e+03 | 7.30e+02 | 1.60e+02 | 0.00e+00 | 6.80e+02 | 0.00e+00 | 5.58e+02 |
| Pu-240 | 6.07e+03 | 7.29e+02 | 1.60e+02 | 0.00e+00 | 6.79e+02 | 0.00e+00 | 5.68e+02 |
| Pu-241 | 1.32e+02 | 6.24e+00 | 2.78e+00 | 0.00e+00 | 1.28e+01 | 0.00e+00 | 1.17e+01 |
| Pu-242 | 5.63e+03 | 7.03e+02 | 1.54e+02 | 0.00e+00 | 6.54e+02 | 0.00e+00 | 5.47e+02 |
| Pu-244 | 6.57e+03 | 8.05e+02 | 1.77e+02 | 0.00e+00 | 7.50e+02 | 0.00e+00 | 8.15e+02 |
| Am-241 | 4.52e+04 | 4.22e+04 | 3.24e+03 | 0.00e+00 | 2.44e+04 | 0.00e+00 | 4.44e+03 |
| Am-242m | 4.55e+04 | 3.97e+04 | 3.25e+03 | 0.00e+00 | 2.42e+04 | 0.00e+00 | 5.59e+03 |
| Am-243 | 4.51e+04 | 4.13e+04 | 3.17e+03 | 0.00e+00 | 2.39e+04 | 0.00e+00 | 5.21e+03 |
| Cm-242 | 1.23e+03 | 1.31e+03 | 8.20e+01 | 0.00e+00 | 3.72e+02 | 0.00e+00 | 4.74e+03 |
| Cm-243 | 3.59e+04 | 3.29e+04 | 2.24e+03 | 0.00e+00 | 1.05e+04 | 0.00e+00 | 4.67e+03 |
| Cm-244 | 2.73e+04 | 2.56e+04 | 1.72e+03 | 0.00e+00 | 8.02e+03 | 0.00e+00 | 4.52e+03 |
| Cm-245 | 5.61e+04 | 4.89e+04 | 3.45e+03 | 0.00e+00 | 1.61e+04 | 0.00e+00 | 4.21e+03 |
| Cm-246 | 5.57e+04 | 4.88e+04 | 3.44e+03 | 0.00e+00 | 1.60e+04 | 0.00e+00 | 4.14e+03 |
| Cm-247 | 5.43e+04 | 4.81e+04 | 3.39e+03 | 0.00e+00 | 1.58e+04 | 0.00e+00 | 5.44e+03 |
| Cm-248 | 4.51e+05 | 3.97e+05 | 2.79e+04 | 0.00e+00 | 1.30e+05 | 0.00e+00 | 8.80e+04 |
| Cf-252 | 1.56e+04 | 0.00e+00 | 3.76e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.72e+04 |

Conversion factors are in units of mrem/hr per uCi/ml.

DOSE FACTORS FOR EXPOSURE TO A SEMI-INFINITE CLOUD OF NOBLE GASES

| Nuclide | ($N_i$) β-air* | ($L_i$) β-Skin** | ($M_i$) γ-air* | ($K_i$) γ-Body** |
|---|---|---|---|---|
| Kr-83m | 2.88E+02 | --- | 1.93E+01 | 7.56E-02 |
| Kr-85m | 1.97E+03 | 1.46E+03 | 1.23E+03 | 1.17E+03 |
| Kr-85 | 1.95E+03 | 1.34E+03 | 1.72E+01 | 1.61E+01 |
| Kr-87 | 1.03E+04 | 9.73E+03 | 6.17E+03 | 5.92E+03 |
| Kr-88 | 2.93E+03 | 2.37E+03 | 1.52E+04 | 1.47E+04 |
| Kr-89 | 1.06E+04 | 1.01E+04 | 1.73E+04 | 1.66E+04 |
| Kr-90 | 7.83E+03 | 7.29E+03 | 1.63E+04 | 1.56E+04 |
| Xe-131m | 1.11E+03 | 4.76E+02 | 1.56E+02 | 9.15E+01 |
| Xe-133m | 1.48E+03 | 9.94E+02 | 3.27E+02 | 2.51E+02 |
| Xe-133 | 1.05E+03 | 3.06E+02 | 3.53E+02 | 2.94E+02 |
| Xe-135m | 7.39E+02 | 7.11E+02 | 3.36E+03 | 3.12E+03 |
| Xe-135 | 2.46E+03 | 1.86E+03 | 1.92E+03 | 1.81E+03 |
| Xe-137 | 1.27E+04 | 1.22E+04 | 1.51E+03 | 1.42E+03 |
| Xe-138 | 4.75E+03 | 4.13E+03 | 9.21E+03 | 8.83E+03 |
| Ar-41 | 3.28E+03 | 2.69E+03 | 9.30E+03 | 8.84E+03 |

$* \frac{mrad - m^3}{\mu Ci - yr}$

$** \frac{mrem - m^3}{\mu Ci - yr}$

Extracted from Table B-1 of Regulatory Guide 1.109, Revision 1, 1977 multiplied by 1E6 pCi/µCi.

# INHALATION PATHWAY DOSES DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Inhalation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| H-3 | 0.00e+00 | 7.18e+02 | 7.18e+02 | 7.18e+02 | 7.18e+02 | 7.18e+02 | 7.18e+02 |
| Be-10 | 1.58e+06 | 2.45e+05 | 3.97e+04 | 0.00e+00 | 0.00e+00 | 1.78e+06 | 1.34e+05 |
| C-14 | 1.82e+04 | 3.41e+03 | 3.41e+03 | 3.41e+03 | 3.41e+03 | 3.41e+03 | 3.41e+03 |
| N-13 | 5.02e+01 | 5.02e+01 | 5.02e+01 | 5.02e+01 | 5.02e+01 | 5.02e+01 | 5.02e+01 |
| F-18 | 3.77e+03 | 0.00e+00 | 4.15e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.39e+01 |
| Na-22 | 1.04e+05 | 1.04e+05 | 1.04e+05 | 1.04e+05 | 1.04e+05 | 1.04e+05 | 1.04e+05 |
| Na-24 | 1.02e+04 | 1.02e+04 | 1.02e+04 | 1.02e+04 | 1.02e+04 | 1.02e+04 | 1.02e+04 |
| P-32 | 1.32e+06 | 7.71e+04 | 5.01e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 8.64e+04 |
| Ca-41 | 3.06e+05 | 0.00e+00 | 3.30e+04 | 0.00e+00 | 0.00e+00 | 3.06e+04 | 2.29e+03 |
| Sc-46 | 4.41e+05 | 8.56e+05 | 2.49e+05 | 0.00e+00 | 7.99e+05 | 0.00e+00 | 2.58e+05 |
| Cr-51 | 0.00e+00 | 0.00e+00 | 1.00e+02 | 5.95e+01 | 2.28e+01 | 1.44e+04 | 3.32e+03 |
| Mn-54 | 0.00e+00 | 3.96e+04 | 6.30e+03 | 0.00e+00 | 9.84e+03 | 1.40e+06 | 7.74e+04 |
| Mn-56 | 0.00e+00 | 1.24e+00 | 1.83e-01 | 0.00e+00 | 1.30e+00 | 9.44e+03 | 2.02e+04 |
| Fe-55 | 2.46e+04 | 1.70e+04 | 3.94e+03 | 0.00e+00 | 0.00e+00 | 7.21e+04 | 6.03e+03 |
| Fe-59 | 1.18e+04 | 2.78e+04 | 1.06e+04 | 0.00e+00 | 0.00e+00 | 1.02e+06 | 1.88e+05 |
| Co-57 | 0.00e+00 | 6.92e+02 | 6.71e+02 | 0.00e+00 | 0.00e+00 | 3.70e+05 | 3.14e+04 |
| Co-58 | 0.00e+00 | 1.58e+03 | 2.07e+03 | 0.00e+00 | 0.00e+00 | 9.28e+05 | 1.06e+05 |
| Co-60 | 0.00e+00 | 1.15e+04 | 1.48e+04 | 0.00e+00 | 0.00e+00 | 5.97e+06 | 2.85e+05 |
| Ni-59 | 3.25e+04 | 1.17e+04 | 5.42e+03 | 0.00e+00 | 0.00e+00 | 6.56e+04 | 4.89e+03 |
| Ni-63 | 4.32e+05 | 3.14e+04 | 1.45e+04 | 0.00e+00 | 0.00e+00 | 1.78e+05 | 1.34e+04 |
| Ni-65 | 1.54e+00 | 2.10e-01 | 9.12e-02 | 0.00e+00 | 0.00e+00 | 5.60e+03 | 1.23e+04 |
| Cu-64 | 0.00e+00 | 1.46e+00 | 6.15e-01 | 0.00e+00 | 4.62e+00 | 6.78e+03 | 4.90e+04 |
| Zn-65 | 3.24e+04 | 1.03e+05 | 4.66e+04 | 0.00e+00 | 6.90e+04 | 8.64e+05 | 5.34e+04 |
| Zn-69 | 3.38e-02 | 6.51e-02 | 4.52e-03 | 0.00e+00 | 4.22e-02 | 9.20e+02 | 1.63e+01 |
| Zn-69m | 8.16e+00 | 1.96e+01 | 1.79e+00 | 0.00e+00 | 1.18e+01 | 1.90e+04 | 1.37e+05 |
| Se-79 | 0.00e+00 | 3.06e+03 | 4.87e+02 | 0.00e+00 | 4.55e+03 | 3.58e+05 | 2.66e+04 |
| Br-82 | 0.00e+00 | 0.00e+00 | 1.35e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.04e+04 |
| Br-83 | 0.00e+00 | 0.00e+00 | 2.41e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.32e+02 |
| Br-84 | 0.00e+00 | 0.00e+00 | 3.13e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.64e-03 |
| Br-85 | 0.00e+00 | 0.00e+00 | 1.28e+01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

Ri factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Inhalation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Rb-86 | 0.00e+00 | 1.35e+05 | 5.90e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.66e+04 |
| Rb-87 | 0.00e+00 | 7.89e+04 | 2.57e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.30e+03 |
| Rb-88 | 0.00e+00 | 3.87e+02 | 1.93e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.34e-09 |
| Rb-89 | 0.00e+00 | 2.56e+02 | 1.70e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 9.28e-12 |
| Sr-89 | 3.04e+05 | 0.00e+00 | 8.72e+03 | 0.00e+00 | 0.00e+00 | 1.40e+06 | 3.50e+05 |
| Sr-90 | 2.87e+07 | 0.00e+00 | 5.77e+05 | 0.00e+00 | 0.00e+00 | 9.60e+06 | 7.22e+05 |
| Sr-91 | 6.19e+01 | 0.00e+00 | 2.50e+00 | 0.00e+00 | 0.00e+00 | 3.65e+04 | 1.91e+05 |
| Sr-92 | 6.74e+00 | 0.00e+00 | 2.91e-01 | 0.00e+00 | 0.00e+00 | 1.65e+04 | 4.30e+04 |
| Y-90 | 2.09e+03 | 0.00e+00 | 5.61e+01 | 0.00e+00 | 0.00e+00 | 1.70e+05 | 5.06e+05 |
| Y-91 | 4.62e+05 | 0.00e+00 | 1.24e+04 | 0.00e+00 | 0.00e+00 | 1.70e+06 | 3.85e+05 |
| Y-91m | 2.61e-01 | 0.00e+00 | 1.02e-02 | 0.00e+00 | 0.00e+00 | 1.92e+03 | 1.33e+00 |
| Y-92 | 1.03e+01 | 0.00e+00 | 3.02e-01 | 0.00e+00 | 0.00e+00 | 1.57e+04 | 7.35e+04 |
| Y-93 | 9.44e+01 | 0.00e+00 | 2.61e+00 | 0.00e+00 | 0.00e+00 | 4.85e+04 | 4.22e+05 |
| Zr-93 | 4.18e+05 | 2.34e+04 | 1.10e+04 | 0.00e+00 | 8.88e+04 | 1.70e+05 | 1.21e+04 |
| Zr-95 | 1.07e+05 | 3.44e+04 | 2.33e+04 | 0.00e+00 | 5.42e+04 | 1.77e+06 | 1.50e+05 |
| Zr-97 | 9.68e+01 | 1.96e+01 | 9.04e+00 | 0.00e+00 | 2.97e+01 | 7.87e+04 | 5.23e+05 |
| Nb-93m | 2.48e+05 | 8.08e+04 | 1.99e+04 | 0.00e+00 | 9.28e+04 | 2.49e+05 | 1.90e+04 |
| Nb-95 | 1.41e+04 | 7.82e+03 | 4.21e+03 | 0.00e+00 | 7.74e+03 | 5.05e+05 | 1.04e+05 |
| Nb-97 | 2.22e-01 | 5.62e-02 | 2.05e-02 | 0.00e+00 | 6.54e-02 | 2.40e+03 | 2.42e+02 |
| Mo-93 | 0.00e+00 | 9.36e+03 | 2.54e+02 | 0.00e+00 | 2.84e+03 | 4.09e+05 | 3.03e+04 |
| Mo-99 | 0.00e+00 | 1.21e+02 | 2.30e+01 | 0.00e+00 | 2.91e+02 | 9.12e+04 | 2.48e+05 |
| Tc-101 | 4.18e-05 | 6.02e-05 | 5.90e-04 | 0.00e+00 | 1.08e-03 | 3.99e+02 | 1.09e-11 |
| Tc-99 | 2.50e+02 | 3.71e+02 | 1.00e+02 | 0.00e+00 | 4.68e+03 | 8.08e+05 | 6.03e+04 |
| Tc-99m | 1.03e-03 | 2.91e-03 | 3.70e-02 | 0.00e+00 | 4.42e-02 | 7.64e+02 | 4.16e+03 |
| Ru-103 | 1.53e+03 | 0.00e+00 | 6.58e+02 | 0.00e+00 | 5.83e+03 | 5.05e+05 | 1.10e+05 |
| Ru-105 | 7.90e-01 | 0.00e+00 | 3.11e-01 | 0.00e+00 | 1.02e+00 | 1.10e+04 | 4.82e+04 |
| Ru-106 | 6.91e+04 | 0.00e+00 | 8.72e+03 | 0.00e+00 | 1.34e+05 | 9.36e+06 | 9.12e+05 |
| Rh-105 | 7.39e+00 | 5.38e+00 | 3.54e+00 | 0.00e+00 | 2.29e+01 | 1.93e+04 | 8.72e+04 |
| Pd-107 | 0.00e+00 | 6.62e+02 | 4.70e+01 | 0.00e+00 | 5.26e+03 | 7.58e+04 | 5.65e+03 |
| Pd-109 | 0.00e+00 | 3.70e+00 | 9.28e-01 | 0.00e+00 | 1.88e+01 | 1.48e+04 | 1.22e+05 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

Ri factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Inhalation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ag-110m | 1.08e+04 | 1.00e+04 | 5.94e+03 | 0.00e+00 | 1.97e+04 | 4.63e+06 | 3.02e+05 |
| Ag-111 | 3.40e+02 | 1.42e+02 | 7.10e+01 | 0.00e+00 | 4.59e+02 | 1.86e+05 | 2.23e+05 |
| Cd-113m | 0.00e+00 | 1.23e+06 | 3.98e+04 | 0.00e+00 | 1.37e+06 | 1.66e+06 | 1.27e+05 |
| Cd-115m | 0.00e+00 | 1.97e+05 | 6.36e+03 | 0.00e+00 | 1.58e+05 | 1.41e+06 | 3.84e+05 |
| Sn-123 | 2.42e+05 | 5.34e+03 | 7.86e+03 | 4.54e+03 | 0.00e+00 | 2.30e+06 | 3.14e+05 |
| Sn-125 | 9.28e+03 | 2.50e+02 | 5.62e+02 | 2.07e+02 | 0.00e+00 | 5.90e+05 | 5.45e+05 |
| Sn-126 | 1.26e+06 | 3.34e+04 | 4.80e+04 | 9.84e+03 | 0.00e+00 | 9.36e+06 | 1.27e+05 |
| Sb-124 | 3.12e+04 | 5.89e+02 | 1.24e+04 | 7.55e+01 | 0.00e+00 | 2.48e+06 | 4.06e+05 |
| Sb-125 | 5.34e+04 | 5.95e+02 | 1.26e+04 | 5.40e+01 | 0.00e+00 | 1.74e+06 | 1.01e+05 |
| Sb-126 | 3.60e+03 | 7.30e+01 | 1.30e+03 | 2.20e+01 | 0.00e+00 | 7.66e+05 | 4.81e+05 |
| Sb-127 | 2.64e+02 | 5.78e+00 | 1.02e+02 | 3.18e+00 | 0.00e+00 | 1.64e+05 | 3.02e+05 |
| Te-125m | 3.42e+03 | 1.58e+03 | 4.67e+02 | 1.05e+03 | 1.24e+04 | 3.14e+05 | 7.06e+04 |
| Te-127 | 1.40e+00 | 6.42e-01 | 3.10e-01 | 1.06e+00 | 5.10e+00 | 6.51e+03 | 5.74e+04 |
| Te-127m | 1.26e+04 | 5.77e+03 | 1.57e+03 | 3.29e+03 | 4.58e+04 | 9.60e+05 | 1.50e+05 |
| Te-129 | 4.98e-02 | 2.39e-02 | 1.24e-02 | 3.90e-02 | 1.87e-01 | 1.94e+03 | 1.57e+02 |
| Te-129m | 9.76e+03 | 4.67e+03 | 1.58e+03 | 3.44e+03 | 3.66e+04 | 1.16e+06 | 3.83e+05 |
| Te-131 | 1.11e-02 | 5.95e-03 | 3.59e-03 | 9.36e-03 | 4.37e-02 | 1.39e+03 | 1.84e+01 |
| Te-131m | 6.99e+01 | 4.36e+01 | 2.90e+01 | 5.50e+01 | 3.09e+02 | 1.46e+05 | 5.56e+05 |
| Te-132 | 2.60e+02 | 2.15e+02 | 1.62e+02 | 1.90e+02 | 1.46e+03 | 2.88e+05 | 5.10e+05 |
| Te-133m | 5.79e-02 | 4.32e-02 | 3.34e-02 | 5.02e-02 | 2.99e-01 | 4.41e+03 | 6.12e+01 |
| Te-134 | 3.07e-02 | 2.58e-02 | 1.26e-02 | 2.75e-02 | 1.74e-01 | 3.47e+03 | 2.38e-01 |
| I-129 | 1.98e+04 | 1.69e+04 | 5.53e+04 | 4.43e+07 | 3.62e+04 | 0.00e+00 | 1.78e+03 |
| I-130 | 4.58e+03 | 1.34e+04 | 5.28e+03 | 1.14e+06 | 2.09e+04 | 0.00e+00 | 7.69e+03 |
| I-131 | 2.52e+04 | 3.58e+04 | 2.05e+04 | 1.19e+07 | 6.13e+04 | 0.00e+00 | 6.28e+03 |
| I-132 | 1.16e+03 | 3.26e+03 | 1.16e+03 | 1.14e+05 | 5.18e+03 | 0.00e+00 | 4.06e+02 |
| I-133 | 8.64e+03 | 1.48e+04 | 4.52e+03 | 2.15e+06 | 2.58e+04 | 0.00e+00 | 8.88e+03 |
| I-134 | 6.44e+02 | 1.73e+03 | 6.15e+02 | 2.98e+04 | 2.75e+03 | 0.00e+00 | 1.01e+00 |
| I-135 | 2.68e+03 | 6.98e+03 | 2.57e+03 | 4.48e+05 | 1.11e+04 | 0.00e+00 | 5.25e+03 |
| Cs-134 | 3.73e+05 | 8.48e+05 | 7.28e+05 | 0.00e+00 | 2.87e+05 | 9.76e+04 | 1.04e+04 |
| Cs-134m | 1.27e+02 | 2.56e+02 | 1.38e+02 | 0.00e+00 | 1.46e+02 | 2.34e+01 | 6.34e+01 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# INHALATION PATHWAY DOSES DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Inhalation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Cs-135 | 1.17e+05 | 1.03e+05 | 4.79e+04 | 0.00e+00 | 4.09e+04 | 1.26e+04 | 1.69e+03 |
| Cs-136 | 3.90e+04 | 1.46e+05 | 1.10e+05 | 0.00e+00 | 8.56e+04 | 1.20e+04 | 1.17e+04 |
| Cs-137 | 4.78e+05 | 6.21e+05 | 4.28e+05 | 0.00e+00 | 2.22e+05 | 7.52e+04 | 8.40e+03 |
| Cs-138 | 3.31e+02 | 6.21e+02 | 3.24e+02 | 0.00e+00 | 4.80e+02 | 4.86e+01 | 1.86e-03 |
| Cs-139 | 2.05e+02 | 2.90e+02 | 1.11e+02 | 0.00e+00 | 2.44e+02 | 2.27e+01 | 4.39e-21 |
| Ba-139 | 9.36e-01 | 6.66e-04 | 2.74e-02 | 0.00e+00 | 6.22e-04 | 3.76e+03 | 8.96e+02 |
| Ba-140 | 3.90e+04 | 4.90e+01 | 2.57e+03 | 0.00e+00 | 1.67e+01 | 1.27e+06 | 2.18e+05 |
| Ba-141 | 1.00e-01 | 7.53e-05 | 3.36e-03 | 0.00e+00 | 7.00e-05 | 1.94e+03 | 1.16e-07 |
| Ba-142 | 2.63e-02 | 2.70e-05 | 1.66e-03 | 0.00e+00 | 2.29e-05 | 1.19e+03 | 1.57e-16 |
| La-140 | 3.44e+02 | 1.74e+02 | 4.58e+01 | 0.00e+00 | 0.00e+00 | 1.36e+05 | 4.58e+05 |
| La-141 | 4.27e+00 | 1.33e+00 | 2.17e-01 | 0.00e+00 | 0.00e+00 | 1.08e+04 | 5.85e+04 |
| La-142 | 6.83e-01 | 3.10e-01 | 7.72e-02 | 0.00e+00 | 0.00e+00 | 6.33e+03 | 2.11e+03 |
| Ce-141 | 1.99e+04 | 1.35e+04 | 1.53e+03 | 0.00e+00 | 6.26e+03 | 3.62e+05 | 1.20e+05 |
| Ce-143 | 1.86e+02 | 1.38e+02 | 1.53e+01 | 0.00e+00 | 6.08e+01 | 7.98e+04 | 2.26e+05 |
| Ce-144 | 3.43e+06 | 1.43e+06 | 1.84e+05 | 0.00e+00 | 8.48e+05 | 7.78e+06 | 8.16e+05 |
| Pr-143 | 9.36e+03 | 3.75e+03 | 4.64e+02 | 0.00e+00 | 2.16e+03 | 2.81e+05 | 2.00e+05 |
| Pr-144 | 3.01e-02 | 1.25e-02 | 1.53e-03 | 0.00e+00 | 7.05e-03 | 1.02e+03 | 2.15e-08 |
| Nd-147 | 5.27e+03 | 6.10e+03 | 3.65e+02 | 0.00e+00 | 3.56e+03 | 2.21e+05 | 1.73e+05 |
| Pm-147 | 6.70e+05 | 6.30e+04 | 2.55e+04 | 0.00e+00 | 1.19e+05 | 5.28e+05 | 4.43e+04 |
| Pm-148 | 3.07e+03 | 5.10e+02 | 2.56e+02 | 0.00e+00 | 9.60e+02 | 3.13e+05 | 4.64e+05 |
| Pm-148m | 7.86e+04 | 2.03e+04 | 1.55e+04 | 0.00e+00 | 3.08e+04 | 1.71e+06 | 3.34e+05 |
| Pm-149 | 2.75e+02 | 3.90e+01 | 1.59e+01 | 0.00e+00 | 7.35e+01 | 5.77e+04 | 2.00e+05 |
| Pm-151 | 6.80e+01 | 1.14e+01 | 5.77e+00 | 0.00e+00 | 2.04e+01 | 3.15e+04 | 1.60e+05 |
| Sm-151 | 6.87e+05 | 1.18e+05 | 2.84e+04 | 0.00e+00 | 1.33e+05 | 3.56e+05 | 2.60e+04 |
| Sm-153 | 1.36e+02 | 1.14e+02 | 8.32e+00 | 0.00e+00 | 3.67e+01 | 3.31e+04 | 1.26e+05 |
| Eu-152 | 1.90e+06 | 4.33e+05 | 3.81e+05 | 0.00e+00 | 2.68e+06 | 2.74e+06 | 1.27e+05 |
| Eu-154 | 5.92e+06 | 7.28e+05 | 5.18e+05 | 0.00e+00 | 3.49e+06 | 4.67e+06 | 2.72e+05 |
| Eu-155 | 8.08e+05 | 1.14e+05 | 7.37e+04 | 0.00e+00 | 5.27e+05 | 7.57e+05 | 4.76e+04 |
| Eu-156 | 1.54e+04 | 1.18e+04 | 1.92e+03 | 0.00e+00 | 7.96e+03 | 6.85e+05 | 3.60e+05 |
| Tb-160 | 1.77e+05 | 0.00e+00 | 2.20e+04 | 0.00e+00 | 7.28e+04 | 1.54e+06 | 2.14e+05 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

Ri factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Inhalation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ho-166m | 2.70e+06 | 8.40e+05 | 6.40e+05 | 0.00e+00 | 1.26e+06 | 3.15e+06 | 1.27e+05 |
| W-181 | 4.98e+01 | 1.62e+01 | 1.74e+00 | 0.00e+00 | 0.00e+00 | 1.37e+04 | 2.02e+03 |
| W-185 | 1.56e+03 | 5.18e+02 | 5.45e+01 | 0.00e+00 | 0.00e+00 | 4.46e+05 | 8.56e+04 |
| W-187 | 8.48e+00 | 7.08e+00 | 2.48e+00 | 0.00e+00 | 0.00e+00 | 2.90e+04 | 1.55e+05 |
| Pb-210 | 2.11e+08 | 5.38e+07 | 6.70e+06 | 0.00e+00 | 1.70e+08 | 2.10e+08 | 1.21e+04 |
| Bi-210 | 1.85e+03 | 1.27e+04 | 1.06e+03 | 0.00e+00 | 1.54e+05 | 8.88e+06 | 2.36e+05 |
| Po-210 | 3.18e+06 | 6.88e+06 | 7.66e+05 | 0.00e+00 | 2.36e+07 | 2.51e+08 | 3.35e+05 |
| Ra-223 | 1.44e+06 | 2.22e+03 | 2.88e+05 | 0.00e+00 | 6.28e+04 | 2.04e+08 | 2.27e+06 |
| Ra-224 | 1.58e+05 | 3.82e+02 | 3.17e+04 | 0.00e+00 | 1.08e+04 | 7.02e+07 | 2.41e+06 |
| Ra-225 | 2.40e+06 | 2.85e+03 | 4.79e+05 | 0.00e+00 | 8.08e+04 | 2.34e+08 | 2.17e+06 |
| Ra-226 | 1.00e+09 | 1.91e+04 | 7.31e+08 | 0.00e+00 | 5.42e+05 | 9.36e+08 | 2.35e+06 |
| Ra-228 | 3.53e+08 | 9.84e+03 | 3.82e+08 | 0.00e+00 | 2.78e+05 | 1.29e+09 | 4.00e+05 |
| Ac-225 | 3.38e+06 | 4.66e+06 | 2.27e+05 | 0.00e+00 | 5.30e+05 | 1.77e+08 | 2.02e+06 |
| Ac-227 | 1.84e+10 | 2.44e+09 | 1.09e+09 | 0.00e+00 | 7.86e+08 | 1.93e+09 | 4.06e+05 |
| Th-227 | 1.74e+06 | 3.14e+04 | 5.00e+04 | 0.00e+00 | 1.78e+05 | 3.02e+08 | 2.67e+06 |
| Th-228 | 1.60e+09 | 2.71e+07 | 5.42e+07 | 0.00e+00 | 1.51e+08 | 8.08e+09 | 2.79e+06 |
| Th-229 | 1.21e+11 | 3.47e+09 | 2.01e+09 | 0.00e+00 | 1.70e+10 | 2.90e+10 | 3.86e+05 |
| Th-230 | 1.83e+10 | 1.05e+09 | 5.09e+08 | 0.00e+00 | 5.12e+09 | 4.97e+09 | 2.98e+05 |
| Th-232 | 2.05e+10 | 8.96e+08 | 7.23e+06 | 0.00e+00 | 4.38e+09 | 4.77e+09 | 2.54e+05 |
| Th-234 | 1.30e+04 | 7.65e+02 | 3.76e+02 | 0.00e+00 | 4.33e+03 | 1.51e+06 | 5.62e+05 |
| Pa-231 | 4.06e+10 | 1.53e+09 | 1.58e+09 | 0.00e+00 | 8.56e+09 | 4.60e+08 | 3.55e+05 |
| Pa-233 | 9.68e+03 | 1.94e+03 | 1.67e+03 | 0.00e+00 | 7.32e+03 | 2.82e+05 | 8.16e+04 |
| U-232 | 4.11e+08 | 0.00e+00 | 2.93e+07 | 0.00e+00 | 4.45e+07 | 1.78e+09 | 3.37e+05 |
| U-233 | 8.72e+07 | 0.00e+00 | 5.28e+06 | 0.00e+00 | 2.03e+07 | 4.26e+08 | 3.11e+05 |
| U-234 | 8.32e+07 | 0.00e+00 | 5.17e+06 | 0.00e+00 | 1.99e+07 | 4.18e+08 | 3.05e+05 |
| U-235 | 8.00e+07 | 0.00e+00 | 4.86e+06 | 0.00e+00 | 1.87e+07 | 3.92e+08 | 3.87e+05 |
| U-236 | 8.00e+07 | 0.00e+00 | 4.96e+06 | 0.00e+00 | 1.91e+07 | 4.00e+08 | 2.86e+05 |
| U-237 | 2.94e+02 | 0.00e+00 | 7.82e+01 | 0.00e+00 | 1.21e+03 | 8.16e+04 | 9.60e+04 |
| U-238 | 7.66e+07 | 0.00e+00 | 4.54e+06 | 0.00e+00 | 1.74e+07 | 3.66e+08 | 2.73e+05 |
| Np-237 | 1.25e+10 | 8.00e+09 | 5.50e+08 | 0.00e+00 | 4.08e+09 | 4.18e+08 | 3.94e+05 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# INHALATION PATHWAY DOSES DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Inhalation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Np-238 | 2.37e+03 | 5.76e+02 | 3.69e+01 | 0.00e+00 | 2.18e+02 | 8.16e+04 | 1.70e+05 |
| Np-239 | 2.30e+02 | 2.03e+02 | 1.24e+01 | 0.00e+00 | 7.00e+01 | 3.76e+04 | 1.19e+05 |
| Pu-238 | 1.14e+10 | 7.77e+09 | 5.52e+08 | 0.00e+00 | 2.37e+09 | 1.46e+09 | 3.62e+05 |
| Pu-239 | 1.33e+10 | 8.56e+09 | 6.20e+08 | 0.00e+00 | 2.64e+09 | 1.38e+09 | 3.30e+05 |
| Pu-240 | 1.32e+10 | 8.56e+09 | 6.18e+08 | 0.00e+00 | 2.63e+09 | 1.38e+09 | 3.37e+05 |
| Pu-241 | 2.74e+08 | 6.95e+07 | 1.03e+07 | 0.00e+00 | 4.74e+07 | 1.22e+06 | 6.92e+03 |
| Pu-242 | 1.22e+10 | 8.24e+09 | 5.97e+08 | 0.00e+00 | 2.54e+09 | 1.32e+09 | 3.24e+05 |
| Pu-244 | 1.43e+10 | 9.44e+09 | 6.83e+08 | 0.00e+00 | 2.91e+09 | 1.51e+09 | 4.82e+05 |
| Am-241 | 1.34e+10 | 9.04e+09 | 5.37e+08 | 0.00e+00 | 4.03e+09 | 4.85e+08 | 3.68e+05 |
| Am-242m | 1.36e+10 | 8.48e+09 | 5.38e+08 | 0.00e+00 | 4.01e+09 | 1.95e+08 | 4.63e+05 |
| Am-243 | 1.34e+10 | 8.80e+09 | 5.26e+08 | 0.00e+00 | 3.96e+09 | 4.60e+08 | 4.32e+05 |
| Cm-242 | 1.78e+08 | 1.42e+08 | 7.87e+06 | 0.00e+00 | 3.58e+07 | 3.14e+08 | 3.93e+05 |
| Cm-243 | 8.80e+09 | 6.09e+09 | 3.69e+08 | 0.00e+00 | 1.72e+09 | 5.05e+08 | 3.87e+05 |
| Cm-244 | 6.70e+09 | 4.70e+09 | 2.81e+08 | 0.00e+00 | 1.31e+09 | 4.85e+08 | 3.74e+05 |
| Cm-245 | 1.39e+10 | 9.12e+09 | 5.71e+08 | 0.00e+00 | 2.66e+09 | 4.68e+08 | 3.49e+05 |
| Cm-246 | 1.38e+10 | 9.12e+09 | 5.70e+08 | 0.00e+00 | 2.66e+09 | 4.77e+08 | 3.43e+05 |
| Cm-247 | 1.34e+10 | 8.96e+09 | 5.62e+08 | 0.00e+00 | 2.62e+09 | 4.68e+08 | 4.50e+05 |
| Cm-248 | 1.12e+11 | 7.41e+10 | 4.63e+09 | 0.00e+00 | 2.16e+10 | 3.86e+09 | 7.27e+06 |
| Cf-252 | 4.34e+09 | 0.00e+00 | 1.86e+08 | 0.00e+00 | 0.00e+00 | 1.59e+09 | 1.42e+06 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# INHALATION PATHWAY DOSES DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Inhalation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| H-3 | 0.00e+00 | 7.25e+02 | 7.25e+02 | 7.25e+02 | 7.25e+02 | 7.25e+02 | 7.25e+02 |
| Be-10 | 2.22e+06 | 3.46e+05 | 5.67e+04 | 0.00e+00 | 0.00e+00 | 3.07e+06 | 1.42e+05 |
| C-14 | 2.60e+04 | 4.87e+03 | 4.87e+03 | 4.87e+03 | 4.87e+03 | 4.87e+03 | 4.87e+03 |
| N-13 | 6.92e+01 | 6.92e+01 | 6.92e+01 | 6.92e+01 | 6.92e+01 | 6.92e+01 | 6.92e+01 |
| F-18 | 5.22e+03 | 0.00e+00 | 5.68e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.11e+02 |
| Na-22 | 1.41e+05 | 1.41e+05 | 1.41e+05 | 1.41e+05 | 1.41e+05 | 1.41e+05 | 1.41e+05 |
| Na-24 | 1.38e+04 | 1.38e+04 | 1.38e+04 | 1.38e+04 | 1.38e+04 | 1.38e+04 | 1.38e+04 |
| P-32 | 1.89e+06 | 1.10e+05 | 7.16e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 9.28e+04 |
| Ca-41 | 3.24e+05 | 0.00e+00 | 3.50e+04 | 0.00e+00 | 0.00e+00 | 8.08e+08 | 2.42e+03 |
| Sc-46 | 5.79e+05 | 1.13e+06 | 3.34e+05 | 0.00e+00 | 1.08e+06 | 0.00e+00 | 2.38e+05 |
| Cr-51 | 0.00e+00 | 0.00e+00 | 1.35e+02 | 7.50e+01 | 3.07e+01 | 2.10e+04 | 3.00e+03 |
| Mn-54 | 0.00e+00 | 5.11e+04 | 8.40e+03 | 0.00e+00 | 1.27e+04 | 1.98e+06 | 6.68e+04 |
| Mn-56 | 0.00e+00 | 1.70e+00 | 2.52e-01 | 0.00e+00 | 1.79e+00 | 1.52e+04 | 5.74e+04 |
| Fe-55 | 3.34e+04 | 2.38e+04 | 5.54e+03 | 0.00e+00 | 0.00e+00 | 1.24e+05 | 6.39e+03 |
| Fe-59 | 1.59e+04 | 3.70e+04 | 1.43e+04 | 0.00e+00 | 0.00e+00 | 1.53e+06 | 1.78e+05 |
| Co-57 | 0.00e+00 | 9.44e+02 | 9.20e+02 | 0.00e+00 | 0.00e+00 | 5.86e+05 | 3.14e+04 |
| Co-58 | 0.00e+00 | 2.07e+03 | 2.78e+03 | 0.00e+00 | 0.00e+00 | 1.34e+06 | 9.52e+04 |
| Co-60 | 0.00e+00 | 1.51e+04 | 1.98e+04 | 0.00e+00 | 0.00e+00 | 8.72e+06 | 2.59e+05 |
| Ni-59 | 4.35e+04 | 1.62e+04 | 7.39e+03 | 0.00e+00 | 0.00e+00 | 1.13e+05 | 5.18e+03 |
| Ni-63 | 5.80e+05 | 4.34e+04 | 1.98e+04 | 0.00e+00 | 0.00e+00 | 3.07e+05 | 1.42e+04 |
| Ni-65 | 2.18e+00 | 2.93e-01 | 1.27e-01 | 0.00e+00 | 0.00e+00 | 9.36e+03 | 3.67e+04 |
| Cu-64 | 0.00e+00 | 2.03e+00 | 8.48e-01 | 0.00e+00 | 6.41e+00 | 1.11e+04 | 6.14e+04 |
| Zn-65 | 3.86e+04 | 1.34e+05 | 6.24e+04 | 0.00e+00 | 8.64e+04 | 1.24e+06 | 4.66e+04 |
| Zn-69 | 4.83e-02 | 9.20e-02 | 6.46e-03 | 0.00e+00 | 6.02e-02 | 1.58e+03 | 2.85e+02 |
| Zn-69m | 1.15e+01 | 2.71e+01 | 2.49e+00 | 0.00e+00 | 1.65e+01 | 3.14e+04 | 1.71e+05 |
| Se-79 | 0.00e+00 | 4.34e+03 | 6.97e+02 | 0.00e+00 | 6.50e+03 | 6.17e+05 | 2.82e+04 |
| Br-82 | 0.00e+00 | 0.00e+00 | 1.82e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-83 | 0.00e+00 | 0.00e+00 | 3.44e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-84 | 0.00e+00 | 0.00e+00 | 4.33e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-85 | 0.00e+00 | 0.00e+00 | 1.83e+01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

Ri factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Inhalation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Rb-86 | 0.00e+00 | 1.90e+05 | 8.40e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.77e+04 |
| Rb-87 | 0.00e+00 | 1.12e+05 | 3.66e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.44e+03 |
| Rb-88 | 0.00e+00 | 5.46e+02 | 2.72e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.92e-05 |
| Rb-89 | 0.00e+00 | 3.52e+02 | 2.33e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.38e-07 |
| Sr-89 | 4.34e+05 | 0.00e+00 | 1.25e+04 | 0.00e+00 | 0.00e+00 | 2.42e+06 | 3.71e+05 |
| Sr-90 | 3.31e+07 | 0.00e+00 | 6.66e+05 | 0.00e+00 | 0.00e+00 | 1.65e+07 | 7.65e+05 |
| Sr-91 | 8.80e+01 | 0.00e+00 | 3.51e+00 | 0.00e+00 | 0.00e+00 | 6.07e+04 | 2.59e+05 |
| Sr-92 | 9.52e+00 | 0.00e+00 | 4.06e-01 | 0.00e+00 | 0.00e+00 | 2.74e+04 | 1.19e+05 |
| Y-90 | 2.98e+03 | 0.00e+00 | 8.00e+01 | 0.00e+00 | 0.00e+00 | 2.93e+05 | 5.59e+05 |
| Y-91 | 6.61e+05 | 0.00e+00 | 1.77e+04 | 0.00e+00 | 0.00e+00 | 2.94e+06 | 4.09e+05 |
| Y-91m | 3.70e-01 | 0.00e+00 | 1.42e-02 | 0.00e+00 | 0.00e+00 | 3.20e+03 | 3.02e+01 |
| Y-92 | 1.47e+01 | 0.00e+00 | 4.29e-01 | 0.00e+00 | 0.00e+00 | 2.68e+04 | 1.65e+05 |
| Y-93 | 1.35e+02 | 0.00e+00 | 3.72e+00 | 0.00e+00 | 0.00e+00 | 8.32e+04 | 5.79e+05 |
| Zr-93 | 5.46e+05 | 2.70e+04 | 1.47e+04 | 0.00e+00 | 9.28e+04 | 2.94e+05 | 1.28e+04 |
| Zr-95 | 1.46e+05 | 4.58e+04 | 3.15e+04 | 0.00e+00 | 6.74e+04 | 2.69e+06 | 1.49e+05 |
| Zr-97 | 1.38e+02 | 2.72e+01 | 1.26e+01 | 0.00e+00 | 4.12e+01 | 1.30e+05 | 6.30e+05 |
| Nb-93m | 3.31e+05 | 1.09e+05 | 2.73e+04 | 0.00e+00 | 1.27e+05 | 4.29e+05 | 2.02e+04 |
| Nb-95 | 1.86e+04 | 1.03e+04 | 5.66e+03 | 0.00e+00 | 1.00e+04 | 7.51e+05 | 9.68e+04 |
| Nb-97 | 3.14e-01 | 7.78e-02 | 2.84e-02 | 0.00e+00 | 9.12e-02 | 3.93e+03 | 2.17e+03 |
| Mo-93 | 0.00e+00 | 1.33e+04 | 3.62e+02 | 0.00e+00 | 4.05e+03 | 7.05e+05 | 3.19e+04 |
| Mo-99 | 0.00e+00 | 1.69e+02 | 3.22e+01 | 0.00e+00 | 4.11e+02 | 1.54e+05 | 2.69e+05 |
| Tc-101 | 5.92e-05 | 8.40e-05 | 8.24e-04 | 0.00e+00 | 1.52e-03 | 6.67e+02 | 8.72e-07 |
| Tc-99 | 3.58e+02 | 5.26e+02 | 1.43e+02 | 0.00e+00 | 6.68e+03 | 1.39e+06 | 6.39e+04 |
| Tc-99m | 1.38e-03 | 3.86e-03 | 4.99e-02 | 0.00e+00 | 5.76e-02 | 1.15e+03 | 6.13e+03 |
| Ru-103 | 2.10e+03 | 0.00e+00 | 8.96e+02 | 0.00e+00 | 7.43e+03 | 7.83e+05 | 1.09e+05 |
| Ru-105 | 1.12e+00 | 0.00e+00 | 4.34e-01 | 0.00e+00 | 1.41e+00 | 1.82e+04 | 9.04e+04 |
| Ru-106 | 9.84e+04 | 0.00e+00 | 1.24e+04 | 0.00e+00 | 1.90e+05 | 1.61e+07 | 9.60e+05 |
| Rh-105 | 1.06e+01 | 7.58e+00 | 4.99e+00 | 0.00e+00 | 3.23e+01 | 3.27e+04 | 9.84e+04 |
| Pd-107 | 0.00e+00 | 9.36e+02 | 6.71e+01 | 0.00e+00 | 7.51e+03 | 1.30e+05 | 5.99e+03 |
| Pd-109 | 0.00e+00 | 5.25e+00 | 1.33e+00 | 0.00e+00 | 2.69e+01 | 2.55e+04 | 1.57e+05 |

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Ri factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Inhalation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ag-110m | 1.38e+04 | 1.31e+04 | 7.99e+03 | 0.00e+00 | 2.50e+04 | 6.75e+06 | 2.73e+05 |
| Ag-111 | 4.86e+02 | 2.02e+02 | 1.01e+02 | 0.00e+00 | 6.54e+02 | 3.20e+05 | 2.40e+05 |
| Cd-113m | 0.00e+00 | 1.74e+06 | 5.68e+04 | 0.00e+00 | 1.94e+06 | 2.87e+06 | 1.34e+05 |
| Cd-115m | 0.00e+00 | 2.78e+05 | 9.12e+03 | 0.00e+00 | 2.26e+05 | 2.42e+06 | 4.08e+05 |
| Sn-123 | 3.45e+05 | 7.55e+03 | 1.12e+04 | 6.04e+03 | 0.00e+00 | 3.97e+06 | 3.33e+05 |
| Sn-125 | 1.33e+04 | 3.54e+02 | 7.99e+02 | 2.76e+02 | 0.00e+00 | 1.01e+06 | 5.83e+05 |
| Sn-126 | 1.74e+06 | 4.31e+04 | 6.59e+04 | 1.14e+04 | 0.00e+00 | 1.38e+07 | 1.34e+05 |
| Sb-124 | 4.30e+04 | 7.94e+02 | 1.68e+04 | 9.76e+01 | 0.00e+00 | 3.85e+06 | 3.98e+05 |
| Sb-125 | 7.38e+04 | 8.08e+02 | 1.72e+04 | 7.04e+01 | 0.00e+00 | 2.74e+06 | 9.92e+04 |
| Sb-126 | 4.95e+03 | 1.02e+02 | 1.78e+03 | 2.80e+01 | 0.00e+00 | 1.24e+06 | 4.81e+05 |
| Sb-127 | 3.71e+02 | 7.94e+00 | 1.40e+02 | 4.17e+00 | 0.00e+00 | 2.65e+05 | 3.15e+05 |
| Te-125m | 4.88e+03 | 2.24e+03 | 6.67e+02 | 1.40e+03 | 0.00e+00 | 5.36e+05 | 7.50e+04 |
| Te-127 | 2.01e+00 | 9.12e-01 | 4.42e-01 | 1.42e+00 | 7.28e+00 | 1.12e+04 | 8.08e+04 |
| Te-127m | 1.80e+04 | 8.16e+03 | 2.18e+03 | 4.38e+03 | 6.54e+04 | 1.66e+06 | 1.59e+05 |
| Te-129 | 7.10e-02 | 3.38e-02 | 1.76e-02 | 5.18e-02 | 2.66e-01 | 3.30e+03 | 1.62e+03 |
| Te-129m | 1.39e+04 | 6.58e+03 | 2.25e+03 | 4.58e+03 | 5.19e+04 | 1.98e+06 | 4.05e+05 |
| Te-131 | 1.58e-02 | 8.32e-03 | 5.04e-03 | 1.24e-02 | 6.18e-02 | 2.34e+03 | 1.51e+01 |
| Te-131m | 9.84e+01 | 6.01e+01 | 4.02e+01 | 7.25e+01 | 4.39e+02 | 2.38e+05 | 6.21e+05 |
| Te-132 | 3.60e+02 | 2.90e+02 | 2.19e+02 | 2.46e+02 | 1.95e+03 | 4.49e+05 | 4.63e+05 |
| Te-133m | 8.08e-02 | 5.86e-02 | 4.57e-02 | 6.54e-02 | 4.06e-01 | 6.97e+03 | 9.84e+02 |
| Te-134 | 4.25e-02 | 3.48e-02 | 2.91e-02 | 3.57e-02 | 2.33e-01 | 5.40e+03 | 1.10e+01 |
| I-129 | 2.82e+04 | 2.35e+04 | 3.92e+04 | 2.93e+07 | 4.21e+04 | 0.00e+00 | 1.83e+03 |
| I-130 | 6.24e+03 | 1.79e+04 | 7.17e+03 | 1.49e+06 | 2.75e+04 | 0.00e+00 | 9.12e+03 |
| I-131 | 3.54e+04 | 4.91e+04 | 2.64e+04 | 1.46e+07 | 8.40e+04 | 0.00e+00 | 6.49e+03 |
| I-132 | 1.59e+03 | 4.38e+03 | 1.58e+03 | 1.51e+05 | 6.92e+03 | 0.00e+00 | 1.27e+03 |
| I-133 | 1.22e+04 | 2.05e+04 | 6.22e+03 | 2.92e+06 | 3.59e+04 | 0.00e+00 | 1.03e+04 |
| I-134 | 8.88e+02 | 2.32e+03 | 8.40e+02 | 3.95e+04 | 3.66e+03 | 0.00e+00 | 2.04e+01 |
| I-135 | 3.70e+03 | 9.44e+03 | 3.49e+03 | 6.21e+05 | 1.49e+04 | 0.00e+00 | 6.95e+03 |
| Cs-134 | 5.02e+05 | 1.13e+06 | 5.49e+05 | 0.00e+00 | 3.75e+05 | 1.46e+05 | 9.76e+03 |
| Cs-134m | 1.76e+02 | 3.48e+02 | 1.88e+02 | 0.00e+00 | 2.03e+02 | 3.65e+01 | 1.62e+02 |

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Ri factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Inhalation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Cs-135 | 1.66e+05 | 1.46e+05 | 3.58e+04 | 0.00e+00 | 5.84e+04 | 2.16e+04 | 1.78e+03 |
| Cs-136 | 5.15e+04 | 1.94e+05 | 1.37e+05 | 0.00e+00 | 1.10e+05 | 1.78e+04 | 1.09e+04 |
| Cs-137 | 6.70e+05 | 8.48e+05 | 3.11e+05 | 0.00e+00 | 3.04e+05 | 1.21e+05 | 8.48e+03 |
| Cs-138 | 4.66e+02 | 8.56e+02 | 4.46e+02 | 0.00e+00 | 6.62e+02 | 7.87e+01 | 2.70e-01 |
| Cs-139 | 2.92e+02 | 4.10e+02 | 1.58e+02 | 0.00e+00 | 3.47e+02 | 3.89e+01 | 1.33e-13 |
| Ba-139 | 1.34e+00 | 9.44e-04 | 3.90e-02 | 0.00e+00 | 8.88e-04 | 6.46e+03 | 6.45e+03 |
| Ba-140 | 5.47e+04 | 6.70e+01 | 3.52e+03 | 0.00e+00 | 2.28e+01 | 2.03e+06 | 2.29e+05 |
| Ba-141 | 1.42e-01 | 1.06e-04 | 4.74e-03 | 0.00e+00 | 9.84e-05 | 3.29e+03 | 7.46e-04 |
| Ba-142 | 3.70e-02 | 3.70e-05 | 2.27e-03 | 0.00e+00 | 3.14e-05 | 1.91e+03 | 4.79e-10 |
| La-140 | 4.79e+02 | 2.36e+02 | 6.26e+01 | 0.00e+00 | 0.00e+00 | 2.14e+05 | 4.87e+05 |
| La-141 | 6.10e+00 | 1.88e+00 | 3.10e-01 | 0.00e+00 | 0.00e+00 | 1.85e+04 | 1.23e+05 |
| La-142 | 9.60e-01 | 4.25e-01 | 1.06e-01 | 0.00e+00 | 0.00e+00 | 1.02e+04 | 1.20e+04 |
| Ce-141 | 2.84e+04 | 1.90e+04 | 2.17e+03 | 0.00e+00 | 8.88e+03 | 6.14e+05 | 1.26e+05 |
| Ce-143 | 2.66e+02 | 1.94e+02 | 2.16e+01 | 0.00e+00 | 8.64e+01 | 1.30e+05 | 2.55e+05 |
| Ce-144 | 4.89e+06 | 2.02e+06 | 2.62e+05 | 0.00e+00 | 1.21e+06 | 1.34e+07 | 8.64e+05 |
| Pr-143 | 1.34e+04 | 5.31e+03 | 6.62e+02 | 0.00e+00 | 3.09e+03 | 4.83e+05 | 2.14e+05 |
| Pr-144 | 4.30e-02 | 1.76e-02 | 2.18e-03 | 0.00e+00 | 1.01e-02 | 1.75e+03 | 2.35e-04 |
| Nd-147 | 7.86e+03 | 8.56e+03 | 5.13e+02 | 0.00e+00 | 5.02e+03 | 3.72e+05 | 1.82e+05 |
| Pm-147 | 9.20e+05 | 8.80e+04 | 3.60e+04 | 0.00e+00 | 1.68e+05 | 9.12e+05 | 4.70e+04 |
| Pm-148 | 4.35e+03 | 7.10e+02 | 3.58e+02 | 0.00e+00 | 1.28e+03 | 5.22e+05 | 4.91e+05 |
| Pm-148m | 1.06e+05 | 2.68e+04 | 2.10e+04 | 0.00e+00 | 4.06e+04 | 2.56e+06 | 3.28e+05 |
| Pm-149 | 3.93e+02 | 5.51e+01 | 2.27e+01 | 0.00e+00 | 1.05e+02 | 9.92e+04 | 2.23e+05 |
| Pm-151 | 9.60e+01 | 1.59e+01 | 8.08e+00 | 0.00e+00 | 2.86e+01 | 5.25e+04 | 1.82e+05 |
| Sm-151 | 8.56e+05 | 1.68e+05 | 3.89e+04 | 0.00e+00 | 1.82e+05 | 6.14e+05 | 2.82e+04 |
| Sm-153 | 1.94e+02 | 1.61e+02 | 1.18e+01 | 0.00e+00 | 5.25e+01 | 5.69e+04 | 1.42e+05 |
| Eu-152 | 2.37e+06 | 5.75e+05 | 5.04e+05 | 0.00e+00 | 2.67e+06 | 4.01e+06 | 1.08e+05 |
| Eu-154 | 7.54e+06 | 9.84e+05 | 6.88e+05 | 0.00e+00 | 4.35e+06 | 7.30e+06 | 2.67e+05 |
| Eu-155 | 1.60e+06 | 1.57e+05 | 9.68e+04 | 0.00e+00 | 6.12e+05 | 1.21e+07 | 4.78e+05 |
| Eu-156 | 2.16e+04 | 1.62e+04 | 2.64e+03 | 0.00e+00 | 1.09e+04 | 1.10e+06 | 3.65e+05 |
| Tb-160 | 2.43e+05 | 0.00e+00 | 3.03e+04 | 0.00e+00 | 9.60e+04 | 2.38e+06 | 2.08e+05 |

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Pathway : Gaseous Release Inhalation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ho-166m | 3.52e+06 | 1.09e+06 | 7.90e+05 | 0.00e+00 | 1.60e+06 | 4.99e+06 | 1.34e+05 |
| W-181 | 7.12e+01 | 2.30e+01 | 2.41e+00 | 0.00e+00 | 0.00e+00 | 2.36e+04 | 2.15e+03 |
| W-185 | 2.22e+03 | 7.34e+02 | 7.78e+01 | 0.00e+00 | 0.00e+00 | 7.68e+05 | 9.12e+04 |
| W-187 | 1.20e+01 | 9.76e+00 | 3.43e+00 | 0.00e+00 | 0.00e+00 | 4.74e+04 | 1.77e+05 |
| Pb-210 | 2.47e+08 | 6.62e+07 | 8.56e+06 | 0.00e+00 | 2.36e+08 | 3.62e+08 | 1.28e+04 |
| Bi-210 | 2.64e+03 | 1.81e+04 | 1.51e+03 | 0.00e+00 | 2.19e+05 | 1.53e+07 | 2.55e+05 |
| Po-210 | 4.54e+06 | 9.76e+06 | 1.10e+06 | 0.00e+00 | 3.37e+07 | 4.33e+08 | 3.56e+05 |
| Ra-223 | 2.06e+06 | 3.14e+03 | 4.11e+05 | 0.00e+00 | 8.96e+04 | 3.51e+08 | 2.43e+06 |
| Ra-224 | 2.26e+05 | 5.42e+02 | 4.52e+04 | 0.00e+00 | 1.54e+04 | 1.21e+08 | 2.63e+06 |
| Ra-225 | 3.42e+06 | 4.03e+03 | 6.85e+05 | 0.00e+00 | 1.15e+05 | 4.03e+08 | 2.31e+06 |
| Ra-226 | 1.06e+09 | 2.70e+04 | 7.90e+08 | 0.00e+00 | 7.74e+05 | 1.62e+09 | 2.49e+06 |
| Ra-228 | 4.27e+08 | 1.39e+04 | 4.70e+08 | 0.00e+00 | 3.98e+05 | 2.22e+09 | 4.24e+05 |
| Ac-225 | 4.83e+06 | 6.60e+06 | 3.25e+05 | 0.00e+00 | 7.58e+05 | 3.05e+08 | 2.16e+06 |
| Ac-227 | 1.99e+10 | 2.95e+09 | 1.18e+09 | 0.00e+00 | 8.56e+08 | 3.33e+09 | 4.30e+05 |
| Th-227 | 2.47e+06 | 4.45e+04 | 7.14e+04 | 0.00e+00 | 2.54e+05 | 5.20e+08 | 2.86e+06 |
| Th-228 | 2.08e+09 | 3.50e+07 | 7.02e+07 | 0.00e+00 | 1.96e+08 | 1.35e+10 | 2.96e+06 |
| Th-229 | 1.23e+11 | 3.55e+09 | 2.05e+09 | 0.00e+00 | 1.74e+10 | 4.19e+10 | 4.10e+05 |
| Th-230 | 1.87e+10 | 1.07e+09 | 5.19e+08 | 0.00e+00 | 5.24e+09 | 7.18e+09 | 3.16e+05 |
| Th-232 | 2.09e+10 | 9.12e+08 | 7.37e+06 | 0.00e+00 | 4.48e+09 | 6.88e+09 | 2.69e+05 |
| Th-234 | 1.86e+04 | 1.08e+03 | 5.37e+02 | 0.00e+00 | 6.18e+03 | 2.61e+06 | 5.99e+05 |
| Pa-231 | 4.26e+10 | 1.60e+09 | 1.66e+09 | 0.00e+00 | 8.96e+09 | 7.93e+08 | 3.77e+05 |
| Pa-233 | 1.34e+04 | 2.59e+03 | 2.31e+03 | 0.00e+00 | 9.76e+03 | 4.31e+05 | 8.00e+04 |
| U-232 | 5.85e+08 | 0.00e+00 | 4.18e+07 | 0.00e+00 | 6.35e+07 | 3.07e+09 | 3.57e+05 |
| U-233 | 1.24e+08 | 0.00e+00 | 7.54e+06 | 0.00e+00 | 2.90e+07 | 7.34e+08 | 3.30e+05 |
| U-234 | 1.18e+08 | 0.00e+00 | 7.38e+06 | 0.00e+00 | 2.84e+07 | 7.19e+08 | 3.23e+05 |
| U-235 | 1.14e+08 | 0.00e+00 | 6.94e+06 | 0.00e+00 | 2.67e+07 | 6.75e+08 | 4.10e+05 |
| U-236 | 1.14e+08 | 0.00e+00 | 7.09e+06 | 0.00e+00 | 2.73e+07 | 6.90e+08 | 3.03e+05 |
| U-237 | 4.20e+02 | 0.00e+00 | 1.12e+02 | 0.00e+00 | 1.73e+03 | 1.41e+05 | 1.03e+05 |
| U-238 | 1.09e+08 | 0.00e+00 | 6.48e+06 | 0.00e+00 | 2.50e+07 | 6.31e+08 | 2.90e+05 |
| Np-237 | 1.31e+10 | 8.48e+09 | 5.77e+08 | 0.00e+00 | 4.28e+09 | 7.19e+08 | 4.18e+05 |

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|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Np-238 | 3.38e+03 | 8.16e+02 | 5.27e+01 | 0.00e+00 | 3.10e+02 | 1.40e+05 | 1.90e+05 |
| Np-239 | 3.38e+02 | 2.88e+02 | 1.77e+01 | 0.00e+00 | 1.00e+02 | 6.49e+04 | 1.32e+05 |
| Pu-238 | 1.20e+10 | 8.24e+09 | 5.78e+08 | 0.00e+00 | 2.48e+09 | 2.50e+09 | 3.83e+05 |
| Pu-239 | 1.38e+10 | 8.96e+09 | 6.44e+08 | 0.00e+00 | 2.75e+09 | 2.34e+09 | 3.50e+05 |
| Pu-240 | 1.38e+10 | 8.96e+09 | 6.43e+08 | 0.00e+00 | 2.74e+09 | 2.34e+09 | 3.57e+05 |
| Pu-241 | 2.99e+08 | 7.65e+07 | 1.12e+07 | 0.00e+00 | 5.18e+07 | 2.08e+06 | 7.34e+03 |
| Pu-242 | 1.28e+10 | 8.64e+09 | 6.20e+08 | 0.00e+00 | 2.65e+09 | 2.26e+09 | 3.43e+05 |
| Pu-244 | 1.50e+10 | 9.92e+09 | 7.10e+08 | 0.00e+00 | 3.03e+09 | 2.58e+09 | 5.11e+05 |
| Am-241 | 1.42e+10 | 9.60e+09 | 5.68e+08 | 0.00e+00 | 4.26e+09 | 8.40e+08 | 3.90e+05 |
| Am-242m | 1.43e+10 | 9.04e+09 | 5.72e+08 | 0.00e+00 | 4.24e+09 | 3.37e+08 | 4.91e+05 |
| Am-243 | 1.42e+10 | 9.36e+09 | 5.56e+08 | 0.00e+00 | 4.17e+09 | 7.93e+08 | 4.58e+05 |
| Cm-242 | 2.54e+08 | 2.01e+08 | 1.13e+07 | 0.00e+00 | 5.12e+07 | 5.41e+08 | 4.17e+05 |
| Cm-243 | 9.52e+09 | 6.64e+09 | 4.00e+08 | 0.00e+00 | 1.87e+09 | 8.72e+08 | 4.10e+05 |
| Cm-244 | 7.35e+09 | 5.22e+09 | 3.10e+08 | 0.00e+00 | 1.45e+09 | 8.40e+08 | 3.97e+05 |
| Cm-245 | 1.46e+10 | 9.76e+09 | 6.02e+08 | 0.00e+00 | 2.82e+09 | 8.08e+08 | 3.70e+05 |
| Cm-246 | 1.45e+10 | 9.76e+09 | 6.02e+08 | 0.00e+00 | 2.81e+09 | 8.24e+08 | 3.63e+05 |
| Cm-247 | 1.42e+10 | 9.52e+09 | 5.93e+08 | 0.00e+00 | 2.77e+09 | 8.08e+08 | 4.78e+05 |
| Cm-248 | 1.18e+11 | 7.86e+10 | 4.89e+09 | 0.00e+00 | 2.28e+10 | 6.66e+09 | 7.70e+06 |
| Cf-252 | 5.73e+09 | 0.00e+00 | 2.46e+08 | 0.00e+00 | 0.00e+00 | 2.74e+09 | 1.51e+06 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

Ri factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Inhalation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| H-3 | 0.00e+00 | 6.40e+02 | 6.40e+02 | 6.40e+02 | 6.40e+02 | 6.40e+02 | 6.40e+02 |
| Be-10 | 3.12e+06 | 3.64e+05 | 7.84e+04 | 0.00e+00 | 0.00e+00 | 2.74e+06 | 6.36e+04 |
| C-14 | 3.59e+04 | 6.73e+03 | 6.73e+03 | 6.73e+03 | 6.73e+03 | 6.73e+03 | 6.73e+03 |
| N-13 | 8.62e+01 | 8.62e+01 | 8.62e+01 | 8.62e+01 | 8.62e+01 | 8.62e+01 | 8.62e+01 |
| F-18 | 6.96e+03 | 0.00e+00 | 6.84e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.25e+03 |
| Na-22 | 1.63e+05 | 1.63e+05 | 1.63e+05 | 1.63e+05 | 1.63e+05 | 1.63e+05 | 1.63e+05 |
| Na-24 | 1.61e+04 | 1.61e+04 | 1.61e+04 | 1.61e+04 | 1.61e+04 | 1.61e+04 | 1.61e+04 |
| P-32 | 2.60e+06 | 1.14e+05 | 9.88e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.22e+04 |
| Ca-41 | 2.61e+05 | 0.00e+00 | 2.85e+04 | 0.00e+00 | 0.00e+00 | 2.67e+08 | 1.09e+03 |
| Sc-46 | 7.29e+05 | 9.99e+05 | 3.85e+05 | 0.00e+00 | 8.84e+05 | 0.00e+00 | 9.06e+04 |
| Cr-51 | 0.00e+00 | 0.00e+00 | 1.54e+02 | 8.55e+01 | 2.43e+01 | 1.70e+04 | 1.08e+03 |
| Mn-54 | 0.00e+00 | 4.29e+04 | 9.51e+03 | 0.00e+00 | 1.00e+04 | 1.58e+06 | 2.29e+04 |
| Mn-56 | 0.00e+00 | 1.66e+00 | 3.12e-01 | 0.00e+00 | 1.67e+00 | 1.31e+04 | 1.23e+05 |
| Fe-55 | 4.74e+04 | 2.52e+04 | 7.77e+03 | 0.00e+00 | 0.00e+00 | 1.11e+05 | 2.87e+03 |
| Fe-59 | 2.07e+04 | 3.34e+04 | 1.67e+04 | 0.00e+00 | 0.00e+00 | 1.27e+06 | 7.07e+04 |
| Co-57 | 0.00e+00 | 9.03e+02 | 1.07e+03 | 0.00e+00 | 0.00e+00 | 5.07e+05 | 1.32e+04 |
| Co-58 | 0.00e+00 | 1.77e+03 | 3.16e+03 | 0.00e+00 | 0.00e+00 | 1.11e+06 | 3.44e+04 |
| Co-60 | 0.00e+00 | 1.31e+04 | 2.26e+04 | 0.00e+00 | 0.00e+00 | 7.07e+06 | 9.62e+04 |
| Ni-59 | 6.14e+04 | 1.73e+04 | 1.05e+04 | 0.00e+00 | 0.00e+00 | 1.01e+05 | 2.33e+03 |
| Ni-63 | 8.21e+05 | 4.62e+04 | 2.80e+04 | 0.00e+00 | 0.00e+00 | 2.75e+05 | 6.33e+03 |
| Ni-65 | 2.99e+00 | 2.96e-01 | 1.64e-01 | 0.00e+00 | 0.00e+00 | 8.18e+03 | 8.40e+04 |
| Cu-64 | 0.00e+00 | 1.99e+00 | 1.07e+00 | 0.00e+00 | 6.03e+00 | 9.58e+03 | 3.67e+04 |
| Zn-65 | 4.26e+04 | 1.13e+05 | 7.03e+04 | 0.00e+00 | 7.14e+04 | 9.95e+05 | 1.63e+04 |
| Zn-69 | 6.70e-02 | 9.66e-02 | 8.92e-03 | 0.00e+00 | 5.85e-02 | 1.42e+03 | 1.02e+04 |
| Zn-69m | 1.58e+01 | 2.69e+01 | 3.18e+00 | 0.00e+00 | 1.56e+01 | 2.72e+04 | 1.00e+05 |
| Se-79 | 0.00e+00 | 4.55e+03 | 9.62e+02 | 0.00e+00 | 6.33e+03 | 5.51e+05 | 1.27e+04 |
| Br-82 | 0.00e+00 | 0.00e+00 | 2.09e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-83 | 0.00e+00 | 0.00e+00 | 4.74e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-84 | 0.00e+00 | 0.00e+00 | 5.48e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-85 | 0.00e+00 | 0.00e+00 | 2.53e+01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

Ri factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Inhalation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Rb-86 | 0.00e+00 | 1.98e+05 | 1.14e+05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.99e+03 |
| Rb-87 | 0.00e+00 | 1.17e+05 | 5.07e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.10e+03 |
| Rb-88 | 0.00e+00 | 5.62e+02 | 3.66e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.72e+01 |
| Rb-89 | 0.00e+00 | 3.45e+02 | 2.90e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.89e+00 |
| Sr-89 | 5.99e+05 | 0.00e+00 | 1.72e+04 | 0.00e+00 | 0.00e+00 | 2.16e+06 | 1.67e+05 |
| Sr-90 | 3.85e+07 | 0.00e+00 | 7.66e+05 | 0.00e+00 | 0.00e+00 | 1.48e+07 | 3.43e+05 |
| Sr-91 | 1.21e+02 | 0.00e+00 | 4.59e+00 | 0.00e+00 | 0.00e+00 | 5.33e+04 | 1.74e+05 |
| Sr-92 | 1.31e+01 | 0.00e+00 | 5.25e-01 | 0.00e+00 | 0.00e+00 | 2.40e+04 | 2.42e+05 |
| Y-90 | 4.11e+03 | 0.00e+00 | 1.11e+02 | 0.00e+00 | 0.00e+00 | 2.62e+05 | 2.68e+05 |
| Y-91 | 9.14e+05 | 0.00e+00 | 2.44e+04 | 0.00e+00 | 0.00e+00 | 2.63e+06 | 1.84e+05 |
| Y-91m | 5.07e-01 | 0.00e+00 | 1.84e-02 | 0.00e+00 | 0.00e+00 | 2.81e+03 | 1.72e+03 |
| Y-92 | 2.03e+01 | 0.00e+00 | 5.81e-01 | 0.00e+00 | 0.00e+00 | 2.39e+04 | 2.39e+05 |
| Y-93 | 1.86e+02 | 0.00e+00 | 5.11e+00 | 0.00e+00 | 0.00e+00 | 7.44e+04 | 3.88e+05 |
| Zr-93 | 7.66e+05 | 2.89e+04 | 2.05e+04 | 0.00e+00 | 1.11e+05 | 2.63e+05 | 5.44e+03 |
| Zr-95 | 1.90e+05 | 4.18e+04 | 3.70e+04 | 0.00e+00 | 5.96e+04 | 2.23e+06 | 6.11e+04 |
| Zr-97 | 1.88e+02 | 2.72e+01 | 1.60e+01 | 0.00e+00 | 3.88e+01 | 1.13e+05 | 3.51e+05 |
| Nb-93m | 4.70e+05 | 1.17e+05 | 3.85e+04 | 0.00e+00 | 1.27e+05 | 3.85e+05 | 9.06e+03 |
| Nb-95 | 2.35e+04 | 9.18e+03 | 6.55e+03 | 0.00e+00 | 8.62e+03 | 6.14e+05 | 3.70e+04 |
| Nb-97 | 4.29e-01 | 7.70e-02 | 3.60e-02 | 0.00e+00 | 8.55e-02 | 3.42e+03 | 2.78e+04 |
| Mo-93 | 0.00e+00 | 1.39e+04 | 5.00e+02 | 0.00e+00 | 3.92e+03 | 6.29e+05 | 1.40e+04 |
| Mo-99 | 0.00e+00 | 1.72e+02 | 4.26e+01 | 0.00e+00 | 3.92e+02 | 1.35e+05 | 1.27e+05 |
| Tc-101 | 8.10e-05 | 8.51e-05 | 1.08e-03 | 0.00e+00 | 1.45e-03 | 5.85e+02 | 1.63e+01 |
| Tc-99 | 4.96e+02 | 5.51e+02 | 1.98e+02 | 0.00e+00 | 6.48e+03 | 1.25e+06 | 2.87e+04 |
| Tc-99m | 1.78e-03 | 3.48e-03 | 5.77e-02 | 0.00e+00 | 5.07e-02 | 9.51e+02 | 4.81e+03 |
| Ru-103 | 2.79e+03 | 0.00e+00 | 1.07e+03 | 0.00e+00 | 7.03e+03 | 6.62e+05 | 4.48e+04 |
| Ru-105 | 1.53e+00 | 0.00e+00 | 5.55e-01 | 0.00e+00 | 1.34e+00 | 1.59e+04 | 9.95e+04 |
| Ru-106 | 1.36e+05 | 0.00e+00 | 1.69e+04 | 0.00e+00 | 1.84e+05 | 1.43e+07 | 4.29e+05 |
| Rh-105 | 1.45e+01 | 7.77e+00 | 6.62e+00 | 0.00e+00 | 3.10e+01 | 2.89e+04 | 4.92e+04 |
| Pd-107 | 0.00e+00 | 9.80e+02 | 9.29e+01 | 0.00e+00 | 7.29e+03 | 1.17e+05 | 2.69e+03 |
| Pd-109 | 0.00e+00 | 5.48e+00 | 1.83e+00 | 0.00e+00 | 2.61e+01 | 2.28e+04 | 9.58e+04 |

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Ri factors for Child age group by nuclide.
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Pathway : Gaseous Release Inhalation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ag-110m | 1.69e+04 | 1.14e+04 | 9.14e+03 | 0.00e+00 | 2.12e+04 | 5.48e+06 | 1.00e+05 |
| Ag-111 | 6.70e+02 | 2.10e+02 | 1.39e+02 | 0.00e+00 | 6.33e+02 | 2.86e+05 | 1.10e+05 |
| Cd-113m | 0.00e+00 | 1.82e+06 | 7.84e+04 | 0.00e+00 | 1.90e+06 | 2.57e+06 | 6.03e+04 |
| Cd-115m | 0.00e+00 | 2.92e+05 | 1.25e+04 | 0.00e+00 | 2.19e+05 | 2.17e+06 | 1.84e+05 |
| Sn-123 | 4.77e+05 | 7.92e+03 | 1.55e+04 | 8.40e+03 | 0.00e+00 | 3.55e+06 | 1.50e+05 |
| Sn-125 | 1.83e+04 | 3.68e+02 | 1.09e+03 | 3.81e+02 | 0.00e+00 | 8.99e+05 | 2.65e+05 |
| Sn-126 | 2.31e+06 | 3.85e+04 | 8.73e+04 | 1.05e+04 | 0.00e+00 | 1.12e+07 | 6.03e+04 |
| Sb-124 | 5.74e+04 | 7.40e+02 | 2.00e+04 | 1.26e+02 | 0.00e+00 | 3.24e+06 | 1.64e+05 |
| Sb-125 | 9.84e+04 | 7.58e+02 | 2.07e+04 | 9.10e+01 | 0.00e+00 | 2.32e+06 | 4.03e+04 |
| Sb-126 | 6.36e+03 | 9.69e+01 | 2.28e+03 | 3.70e+01 | 0.00e+00 | 1.06e+06 | 2.10e+05 |
| Sb-127 | 5.03e+02 | 7.73e+00 | 1.74e+02 | 5.59e+00 | 0.00e+00 | 2.28e+05 | 1.41e+05 |
| Te-125m | 6.73e+03 | 2.33e+03 | 9.14e+02 | 1.92e+03 | 0.00e+00 | 4.77e+05 | 3.38e+04 |
| Te-127 | 2.77e+00 | 9.51e-01 | 6.10e-01 | 1.96e+00 | 7.07e+00 | 1.00e+04 | 5.62e+04 |
| Te-127m | 2.49e+04 | 8.55e+03 | 3.02e+03 | 6.07e+03 | 6.36e+04 | 1.48e+06 | 7.14e+04 |
| Te-129 | 9.77e-02 | 3.50e-02 | 2.38e-02 | 7.14e-02 | 2.57e-01 | 2.93e+03 | 2.55e+04 |
| Te-129m | 1.92e+04 | 6.84e+03 | 3.04e+03 | 6.33e+03 | 5.03e+04 | 1.76e+06 | 1.82e+05 |
| Te-131 | 2.17e-02 | 8.44e-03 | 6.59e-03 | 1.70e-02 | 5.88e-02 | 2.05e+03 | 1.33e+03 |
| Te-131m | 1.34e+02 | 5.92e+01 | 5.07e+01 | 9.77e+01 | 4.00e+02 | 2.06e+05 | 3.08e+05 |
| Te-132 | 4.81e+02 | 2.72e+02 | 2.63e+02 | 3.17e+02 | 1.77e+03 | 3.77e+05 | 1.38e+05 |
| Te-133m | 1.08e-01 | 5.59e-02 | 5.55e-02 | 8.58e-02 | 3.74e-01 | 5.92e+03 | 1.76e+04 |
| Te-134 | 5.66e-02 | 3.26e-02 | 3.48e-02 | 4.59e-02 | 2.11e-01 | 4.55e+03 | 1.80e+03 |
| I-129 | 3.88e+04 | 2.37e+04 | 2.11e+04 | 1.58e+07 | 4.00e+04 | 0.00e+00 | 7.96e+02 |
| I-130 | 8.18e+03 | 1.64e+04 | 8.44e+03 | 1.85e+06 | 2.45e+04 | 0.00e+00 | 5.11e+03 |
| I-131 | 4.81e+04 | 4.81e+04 | 2.73e+04 | 1.62e+07 | 7.88e+04 | 0.00e+00 | 2.84e+03 |
| I-132 | 2.12e+03 | 4.07e+03 | 1.88e+03 | 1.94e+05 | 6.25e+03 | 0.00e+00 | 3.20e+03 |
| I-133 | 1.66e+04 | 2.03e+04 | 7.70e+03 | 3.85e+06 | 3.38e+04 | 0.00e+00 | 5.48e+03 |
| I-134 | 1.17e+03 | 2.16e+03 | 9.95e+02 | 5.07e+04 | 3.30e+03 | 0.00e+00 | 9.55e+02 |
| I-135 | 4.92e+03 | 8.73e+03 | 4.14e+03 | 7.92e+05 | 1.34e+04 | 0.00e+00 | 4.44e+03 |
| Cs-134 | 6.51e+05 | 1.01e+06 | 2.25e+05 | 0.00e+00 | 3.30e+05 | 1.21e+05 | 3.85e+03 |
| Cs-134m | 2.34e+02 | 3.30e+02 | 2.26e+02 | 0.00e+00 | 1.83e+02 | 3.09e+01 | 2.93e+02 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

Ri factors for Child age group by nuclide.
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Pathway : Gaseous Release Inhalation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Cs-135 | 2.31e+05 | 1.53e+05 | 1.65e+04 | 0.00e+00 | 5.66e+04 | 1.93e+04 | 8.03e+02 |
| Cs-136 | 6.51e+04 | 1.71e+05 | 1.16e+05 | 0.00e+00 | 9.55e+04 | 1.45e+04 | 4.18e+03 |
| Cs-137 | 9.06e+05 | 8.25e+05 | 1.28e+05 | 0.00e+00 | 2.82e+05 | 1.04e+05 | 3.62e+03 |
| Cs-138 | 6.33e+02 | 8.40e+02 | 5.55e+02 | 0.00e+00 | 6.22e+02 | 6.81e+01 | 2.70e+02 |
| Cs-139 | 4.03e+02 | 4.26e+02 | 2.15e+02 | 0.00e+00 | 3.36e+02 | 3.46e+01 | 2.68e-02 |
| Ba-139 | 1.84e+00 | 9.84e-04 | 5.36e-02 | 0.00e+00 | 8.62e-04 | 5.77e+03 | 5.77e+04 |
| Ba-140 | 7.40e+04 | 6.48e+01 | 4.33e+03 | 0.00e+00 | 2.11e+01 | 1.74e+06 | 1.02e+05 |
| Ba-141 | 1.96e-01 | 1.09e-04 | 6.36e-03 | 0.00e+00 | 9.47e-05 | 2.92e+03 | 2.75e+02 |
| Ba-142 | 5.00e-02 | 3.60e-05 | 2.79e-03 | 0.00e+00 | 2.91e-05 | 1.64e+03 | 2.74e+00 |
| La-140 | 6.44e+02 | 2.25e+02 | 7.55e+01 | 0.00e+00 | 0.00e+00 | 1.83e+05 | 2.26e+05 |
| La-141 | 8.44e+00 | 1.96e+00 | 4.26e-01 | 0.00e+00 | 0.00e+00 | 1.66e+04 | 1.62e+05 |
| La-142 | 1.30e+00 | 4.11e-01 | 1.29e-01 | 0.00e+00 | 0.00e+00 | 8.70e+03 | 7.58e+04 |
| Ce-141 | 3.92e+04 | 1.95e+04 | 2.90e+03 | 0.00e+00 | 8.55e+03 | 5.44e+05 | 5.66e+04 |
| Ce-143 | 3.66e+02 | 1.99e+02 | 2.87e+01 | 0.00e+00 | 8.36e+01 | 1.15e+05 | 1.27e+05 |
| Ce-144 | 6.77e+06 | 2.12e+06 | 3.61e+05 | 0.00e+00 | 1.17e+06 | 1.20e+07 | 3.88e+05 |
| Pr-143 | 1.85e+04 | 5.55e+03 | 9.14e+02 | 0.00e+00 | 3.00e+03 | 4.33e+05 | 9.73e+04 |
| Pr-144 | 5.96e-02 | 1.85e-02 | 3.00e-03 | 0.00e+00 | 9.77e-03 | 1.57e+03 | 1.97e+02 |
| Nd-147 | 1.08e+04 | 8.73e+03 | 6.81e+02 | 0.00e+00 | 4.81e+03 | 3.28e+05 | 8.21e+04 |
| Pm-147 | 1.30e+06 | 9.32e+04 | 5.03e+04 | 0.00e+00 | 1.65e+05 | 8.14e+05 | 2.11e+04 |
| Pm-148 | 5.96e+03 | 7.18e+02 | 4.62e+02 | 0.00e+00 | 1.22e+03 | 4.59e+05 | 2.22e+05 |
| Pm-148m | 1.22e+05 | 2.42e+04 | 2.42e+04 | 0.00e+00 | 3.60e+04 | 2.12e+06 | 1.32e+05 |
| Pm-149 | 5.44e+02 | 5.77e+01 | 3.13e+01 | 0.00e+00 | 1.02e+02 | 8.88e+04 | 1.08e+05 |
| Pm-151 | 1.32e+02 | 1.60e+01 | 1.04e+01 | 0.00e+00 | 2.72e+01 | 4.59e+04 | 9.25e+04 |
| Sm-151 | 1.16e+06 | 1.76e+05 | 5.51e+04 | 0.00e+00 | 1.81e+05 | 5.48e+05 | 1.27e+04 |
| Sm-153 | 2.68e+02 | 1.67e+02 | 1.61e+01 | 0.00e+00 | 5.07e+01 | 5.07e+04 | 6.92e+04 |
| Eu-152 | 2.75e+06 | 5.07e+05 | 5.96e+05 | 0.00e+00 | 2.12e+06 | 3.33e+06 | 4.22e+04 |
| Eu-154 | 1.01e+07 | 9.21e+05 | 8.40e+05 | 0.00e+00 | 4.03e+06 | 6.14e+06 | 1.10e+05 |
| Eu-155 | 2.07e+06 | 1.50e+05 | 1.18e+05 | 0.00e+00 | 5.59e+05 | 1.03e+06 | 1.99e+05 |
| Eu-156 | 2.92e+04 | 1.57e+04 | 3.24e+03 | 0.00e+00 | 1.01e+04 | 9.40e+05 | 1.57e+05 |
| Tb-160 | 2.88e+05 | 0.00e+00 | 3.58e+04 | 0.00e+00 | 8.58e+04 | 1.98e+06 | 8.44e+04 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

Ri factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Inhalation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ho-166m | 4.96e+06 | 1.04e+06 | 8.77e+05 | 0.00e+00 | 1.48e+06 | 4.18e+06 | 6.03e+04 |
| W-181 | 9.84e+01 | 2.41e+01 | 3.33e+00 | 0.00e+00 | 0.00e+00 | 2.11e+04 | 9.66e+02 |
| W-185 | 3.07e+03 | 7.70e+02 | 1.08e+02 | 0.00e+00 | 0.00e+00 | 6.88e+05 | 4.11e+04 |
| W-187 | 1.63e+01 | 9.66e+00 | 4.33e+00 | 0.00e+00 | 0.00e+00 | 4.11e+04 | 9.10e+04 |
| Pb-210 | 2.97e+08 | 6.84e+07 | 1.18e+07 | 0.00e+00 | 2.33e+08 | 3.23e+08 | 5.74e+03 |
| Bi-210 | 3.64e+03 | 1.89e+04 | 2.09e+03 | 0.00e+00 | 2.13e+05 | 1.37e+07 | 1.19e+05 |
| Po-210 | 6.29e+06 | 1.02e+07 | 1.51e+06 | 0.00e+00 | 3.27e+07 | 3.88e+08 | 1.60e+05 |
| Ra-223 | 2.85e+06 | 3.29e+03 | 5.70e+05 | 0.00e+00 | 8.73e+04 | 3.14e+08 | 1.11e+06 |
| Ra-224 | 3.12e+05 | 5.66e+02 | 6.25e+04 | 0.00e+00 | 1.50e+04 | 1.08e+08 | 1.24e+06 |
| Ra-225 | 4.74e+06 | 4.22e+03 | 9.47e+05 | 0.00e+00 | 1.12e+05 | 3.60e+08 | 1.05e+06 |
| Ra-226 | 8.66e+08 | 2.83e+04 | 7.10e+08 | 0.00e+00 | 7.51e+05 | 1.44e+09 | 1.12e+06 |
| Ra-228 | 5.51e+08 | 1.46e+04 | 6.22e+08 | 0.00e+00 | 3.85e+05 | 1.99e+09 | 1.90e+05 |
| Ac-225 | 6.70e+06 | 6.92e+06 | 4.48e+05 | 0.00e+00 | 7.36e+05 | 2.73e+08 | 9.88e+05 |
| Ac-227 | 1.84e+10 | 2.98e+09 | 1.14e+09 | 0.00e+00 | 6.55e+08 | 2.97e+09 | 1.93e+05 |
| Th-227 | 3.42e+06 | 4.66e+04 | 9.88e+04 | 0.00e+00 | 2.47e+05 | 4.66e+08 | 1.29e+06 |
| Th-228 | 2.98e+09 | 3.85e+07 | 1.01e+08 | 0.00e+00 | 2.00e+08 | 1.24e+10 | 1.33e+06 |
| Th-229 | 8.07e+10 | 2.12e+09 | 1.34e+09 | 0.00e+00 | 1.05e+10 | 4.00e+10 | 1.85e+05 |
| Th-230 | 1.22e+10 | 6.40e+08 | 3.40e+08 | 0.00e+00 | 3.15e+09 | 6.84e+09 | 1.42e+05 |
| Th-232 | 1.36e+10 | 5.44e+08 | 4.74e+06 | 0.00e+00 | 2.69e+09 | 6.55e+09 | 1.21e+05 |
| Th-234 | 2.57e+04 | 1.14e+03 | 7.40e+02 | 0.00e+00 | 5.99e+03 | 2.33e+06 | 2.71e+05 |
| Pa-231 | 3.19e+10 | 1.06e+09 | 1.27e+09 | 0.00e+00 | 5.77e+09 | 7.10e+08 | 1.69e+05 |
| Pa-233 | 1.53e+04 | 2.40e+03 | 2.68e+03 | 0.00e+00 | 8.81e+03 | 3.61e+05 | 3.31e+04 |
| U-232 | 8.10e+08 | 0.00e+00 | 5.77e+07 | 0.00e+00 | 6.18e+07 | 2.75e+09 | 1.60e+05 |
| U-233 | 1.72e+08 | 0.00e+00 | 1.04e+07 | 0.00e+00 | 2.82e+07 | 6.55e+08 | 1.48e+05 |
| U-234 | 1.65e+08 | 0.00e+00 | 1.02e+07 | 0.00e+00 | 2.76e+07 | 6.44e+08 | 1.45e+05 |
| U-235 | 1.58e+08 | 0.00e+00 | 9.58e+06 | 0.00e+00 | 2.59e+07 | 6.03e+08 | 1.84e+05 |
| U-236 | 1.58e+08 | 0.00e+00 | 9.80e+06 | 0.00e+00 | 2.65e+07 | 6.18e+08 | 1.36e+05 |
| U-237 | 5.81e+02 | 0.00e+00 | 1.54e+02 | 0.00e+00 | 1.68e+03 | 1.26e+05 | 4.77e+04 |
| U-238 | 1.51e+08 | 0.00e+00 | 8.95e+06 | 0.00e+00 | 2.42e+07 | 5.66e+08 | 1.30e+05 |
| Np-237 | 1.01e+10 | 5.99e+09 | 4.40e+08 | 0.00e+00 | 2.74e+09 | 6.44e+08 | 1.87e+05 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

Ri factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Inhalation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Np-238 | 4.66e+03 | 8.51e+02 | 7.29e+01 | 0.00e+00 | 3.02e+02 | 1.25e+05 | 9.25e+04 |
| Np-239 | 4.66e+02 | 3.01e+02 | 2.35e+01 | 0.00e+00 | 9.73e+01 | 5.81e+04 | 6.40e+04 |
| Pu-238 | 9.44e+09 | 5.92e+09 | 4.48e+08 | 0.00e+00 | 1.65e+09 | 2.25e+09 | 1.72e+05 |
| Pu-239 | 1.03e+10 | 6.22e+09 | 4.74e+08 | 0.00e+00 | 1.77e+09 | 2.12e+09 | 1.57e+05 |
| Pu-240 | 1.03e+10 | 6.22e+09 | 4.70e+08 | 0.00e+00 | 1.76e+09 | 2.11e+09 | 1.60e+05 |
| Pu-241 | 2.94e+08 | 6.48e+07 | 1.08e+07 | 0.00e+00 | 4.07e+07 | 1.87e+06 | 3.29e+03 |
| Pu-242 | 9.58e+09 | 5.99e+09 | 4.55e+08 | 0.00e+00 | 1.70e+09 | 2.04e+09 | 1.54e+05 |
| Pu-244 | 1.12e+10 | 6.84e+09 | 5.22e+08 | 0.00e+00 | 1.95e+09 | 2.33e+09 | 2.29e+05 |
| Am-241 | 1.10e+10 | 6.81e+09 | 4.59e+08 | 0.00e+00 | 2.82e+09 | 7.47e+08 | 1.75e+05 |
| Am-242m | 1.14e+10 | 6.51e+09 | 4.70e+08 | 0.00e+00 | 2.85e+09 | 3.01e+08 | 2.21e+05 |
| Am-243 | 1.09e+10 | 6.59e+09 | 4.44e+08 | 0.00e+00 | 2.75e+09 | 7.10e+08 | 2.05e+05 |
| Cm-242 | 3.51e+08 | 2.10e+08 | 1.55e+07 | 0.00e+00 | 4.96e+07 | 4.85e+08 | 1.87e+05 |
| Cm-243 | 8.58e+09 | 5.25e+09 | 3.68e+08 | 0.00e+00 | 1.38e+09 | 7.77e+08 | 1.84e+05 |
| Cm-244 | 7.18e+09 | 4.37e+09 | 3.07e+08 | 0.00e+00 | 1.13e+09 | 7.47e+08 | 1.78e+05 |
| Cm-245 | 1.13e+10 | 6.81e+09 | 4.74e+08 | 0.00e+00 | 1.86e+09 | 7.22e+08 | 1.66e+05 |
| Cm-246 | 1.12e+10 | 6.81e+09 | 4.74e+08 | 0.00e+00 | 1.86e+09 | 7.36e+08 | 1.63e+05 |
| Cm-247 | 1.09e+10 | 6.73e+09 | 4.66e+08 | 0.00e+00 | 1.83e+09 | 7.22e+08 | 2.15e+05 |
| Cm-248 | 9.06e+10 | 5.55e+10 | 3.85e+09 | 0.00e+00 | 1.51e+10 | 5.96e+09 | 3.46e+06 |
| Cf-252 | 8.07e+09 | 0.00e+00 | 3.45e+08 | 0.00e+00 | 0.00e+00 | 2.45e+09 | 6.81e+05 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

Ri factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Inhalation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| H-3 | 0.00e+00 | 3.68e+02 | 3.68e+02 | 3.68e+02 | 3.68e+02 | 3.68e+02 | 3.68e+02 |
| Be-10 | 1.33e+06 | 1.75e+05 | 3.71e+04 | 0.00e+00 | 0.00e+00 | 2.09e+06 | 2.42e+04 |
| C-14 | 2.65e+04 | 5.31e+03 | 5.31e+03 | 5.31e+03 | 5.31e+03 | 5.31e+03 | 5.31e+03 |
| N-13 | 6.15e+01 | 6.15e+01 | 6.15e+01 | 6.15e+01 | 6.15e+01 | 6.15e+01 | 6.15e+01 |
| F-18 | 5.49e+03 | 0.00e+00 | 4.66e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 8.54e+02 |
| Na-22 | 1.03e+05 | 1.03e+05 | 1.03e+05 | 1.03e+05 | 1.03e+05 | 1.03e+05 | 1.03e+05 |
| Na-24 | 1.06e+04 | 1.06e+04 | 1.06e+04 | 1.06e+04 | 1.06e+04 | 1.06e+04 | 1.06e+04 |
| P-32 | 2.03e+06 | 1.12e+05 | 7.74e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.61e+04 |
| Ca-41 | 1.05e+05 | 0.00e+00 | 1.14e+04 | 0.00e+00 | 0.00e+00 | 9.72e+07 | 4.14e+02 |
| Sc-46 | 5.25e+05 | 7.57e+05 | 2.37e+05 | 0.00e+00 | 4.98e+05 | 0.00e+00 | 3.07e+04 |
| Cr-51 | 0.00e+00 | 0.00e+00 | 8.95e+01 | 5.75e+01 | 1.32e+01 | 1.28e+04 | 3.57e+02 |
| Mn-54 | 0.00e+00 | 2.53e+04 | 4.98e+03 | 0.00e+00 | 4.98e+03 | 1.00e+06 | 7.06e+03 |
| Mn-56 | 0.00e+00 | 1.54e+00 | 2.21e-01 | 0.00e+00 | 1.10e+00 | 1.25e+04 | 7.17e+04 |
| Fe-55 | 1.97e+04 | 1.17e+04 | 3.33e+03 | 0.00e+00 | 0.00e+00 | 8.69e+04 | 1.09e+03 |
| Fe-59 | 1.36e+04 | 2.35e+04 | 9.48e+03 | 0.00e+00 | 0.00e+00 | 1.01e+06 | 2.48e+04 |
| Co-57 | 0.00e+00 | 6.51e+02 | 6.41e+02 | 0.00e+00 | 0.00e+00 | 3.79e+05 | 4.86e+03 |
| Co-58 | 0.00e+00 | 1.22e+03 | 1.82e+03 | 0.00e+00 | 0.00e+00 | 7.77e+05 | 1.11e+04 |
| Co-60 | 0.00e+00 | 8.02e+03 | 1.18e+04 | 0.00e+00 | 0.00e+00 | 4.51e+06 | 3.19e+04 |
| Ni-59 | 2.53e+04 | 7.62e+03 | 4.34e+03 | 0.00e+00 | 0.00e+00 | 7.67e+04 | 8.88e+02 |
| Ni-63 | 3.39e+05 | 2.04e+04 | 1.16e+04 | 0.00e+00 | 0.00e+00 | 2.09e+05 | 2.42e+03 |
| Ni-65 | 2.39e+00 | 2.84e-01 | 1.23e-01 | 0.00e+00 | 0.00e+00 | 8.12e+03 | 5.01e+04 |
| Cu-64 | 0.00e+00 | 1.88e+00 | 7.74e-01 | 0.00e+00 | 3.98e+00 | 9.30e+03 | 1.50e+04 |
| Zn-65 | 1.93e+04 | 6.26e+04 | 3.11e+04 | 0.00e+00 | 3.25e+04 | 6.47e+05 | 5.14e+04 |
| Zn-69 | 5.39e-02 | 9.67e-02 | 7.18e-03 | 0.00e+00 | 4.02e-02 | 1.47e+03 | 1.32e+04 |
| Zn-69m | 1.26e+01 | 2.58e+01 | 2.34e+00 | 0.00e+00 | 1.04e+01 | 2.67e+04 | 4.09e+04 |
| Se-79 | 0.00e+00 | 3.15e+03 | 5.88e+02 | 0.00e+00 | 3.46e+03 | 4.19e+05 | 4.84e+03 |
| Br-82 | 0.00e+00 | 0.00e+00 | 1.33e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-83 | 0.00e+00 | 0.00e+00 | 3.81e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-84 | 0.00e+00 | 0.00e+00 | 4.00e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-85 | 0.00e+00 | 0.00e+00 | 2.04e+01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

Ri factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Inhalation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Rb-86 | 0.00e+00 | 1.90e+05 | 8.82e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.04e+03 |
| Rb-87 | 0.00e+00 | 9.95e+04 | 3.70e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.19e+02 |
| Rb-88 | 0.00e+00 | 5.57e+02 | 2.87e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.39e+02 |
| Rb-89 | 0.00e+00 | 3.21e+02 | 2.06e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.82e+01 |
| Sr-89 | 3.98e+05 | 0.00e+00 | 1.14e+04 | 0.00e+00 | 0.00e+00 | 2.03e+06 | 6.40e+04 |
| Sr-90 | 1.55e+07 | 0.00e+00 | 3.12e+05 | 0.00e+00 | 0.00e+00 | 1.12e+07 | 1.31e+05 |
| Sr-91 | 9.56e+01 | 0.00e+00 | 3.46e+00 | 0.00e+00 | 0.00e+00 | 5.26e+04 | 7.34e+04 |
| Sr-92 | 1.05e+01 | 0.00e+00 | 3.91e-01 | 0.00e+00 | 0.00e+00 | 2.38e+04 | 1.40e+05 |
| Y-90 | 3.29e+03 | 0.00e+00 | 8.82e+01 | 0.00e+00 | 0.00e+00 | 2.69e+05 | 1.04e+05 |
| Y-91 | 5.88e+05 | 0.00e+00 | 1.57e+04 | 0.00e+00 | 0.00e+00 | 2.45e+06 | 7.03e+04 |
| Y-91m | 4.07e-01 | 0.00e+00 | 1.39e-02 | 0.00e+00 | 0.00e+00 | 2.79e+03 | 2.35e+03 |
| Y-92 | 1.64e+01 | 0.00e+00 | 4.61e-01 | 0.00e+00 | 0.00e+00 | 2.45e+04 | 1.27e+05 |
| Y-93 | 1.50e+02 | 0.00e+00 | 4.07e+00 | 0.00e+00 | 0.00e+00 | 7.64e+04 | 1.67e+05 |
| Zr-93 | 3.14e+05 | 1.33e+04 | 8.65e+03 | 0.00e+00 | 4.47e+04 | 1.92e+05 | 2.07e+03 |
| Zr-95 | 1.15e+05 | 2.79e+04 | 2.03e+04 | 0.00e+00 | 3.11e+04 | 1.75e+06 | 2.17e+04 |
| Zr-97 | 1.50e+02 | 2.56e+01 | 1.17e+01 | 0.00e+00 | 2.59e+01 | 1.10e+05 | 1.40e+05 |
| Nb-93m | 1.93e+05 | 5.03e+04 | 1.61e+04 | 0.00e+00 | 5.15e+04 | 2.93e+05 | 3.46e+03 |
| Nb-95 | 1.57e+04 | 6.43e+03 | 3.78e+03 | 0.00e+00 | 4.72e+03 | 4.79e+05 | 1.27e+04 |
| Nb-97 | 3.42e-01 | 7.29e-02 | 2.63e-02 | 0.00e+00 | 5.70e-02 | 3.32e+03 | 2.69e+04 |
| Mo-93 | 0.00e+00 | 9.04e+03 | 3.11e+02 | 0.00e+00 | 2.16e+03 | 4.76e+05 | 5.26e+03 |
| Mo-99 | 0.00e+00 | 1.65e+02 | 3.23e+01 | 0.00e+00 | 2.65e+02 | 1.35e+05 | 4.87e+04 |
| Tc-101 | 6.51e-05 | 8.23e-05 | 8.12e-04 | 0.00e+00 | 9.79e-04 | 5.84e+02 | 8.44e+02 |
| Tc-99 | 2.93e+02 | 3.75e+02 | 1.24e+02 | 0.00e+00 | 3.49e+03 | 9.48e+05 | 1.09e+04 |
| Tc-99m | 1.40e-03 | 2.88e-03 | 3.72e-02 | 0.00e+00 | 3.11e-02 | 8.11e+02 | 2.03e+03 |
| Ru-103 | 2.02e+03 | 0.00e+00 | 6.79e+02 | 0.00e+00 | 4.24e+03 | 5.52e+05 | 1.61e+04 |
| Ru-105 | 1.22e+00 | 0.00e+00 | 4.10e-01 | 0.00e+00 | 8.99e-01 | 1.57e+04 | 4.84e+04 |
| Ru-106 | 8.68e+04 | 0.00e+00 | 1.09e+04 | 0.00e+00 | 1.07e+05 | 1.16e+07 | 1.64e+05 |
| Rh-105 | 1.16e+01 | 7.57e+00 | 5.08e+00 | 0.00e+00 | 2.10e+01 | 2.91e+04 | 1.92e+04 |
| Pd-107 | 0.00e+00 | 6.89e+02 | 5.75e+01 | 0.00e+00 | 3.85e+03 | 8.88e+04 | 1.03e+03 |
| Pd-109 | 0.00e+00 | 5.49e+00 | 1.47e+00 | 0.00e+00 | 1.79e+01 | 2.35e+04 | 3.99e+04 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

Ri factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Inhalation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ag-110m | 9.98e+03 | 7.22e+03 | 5.00e+03 | 0.00e+00 | 1.09e+04 | 3.67e+06 | 3.30e+04 |
| Ag-111 | 5.25e+02 | 2.03e+02 | 1.08e+02 | 0.00e+00 | 4.27e+02 | 2.88e+05 | 4.23e+04 |
| Cd-113m | 0.00e+00 | 9.34e+05 | 3.70e+04 | 0.00e+00 | 8.12e+05 | 1.96e+06 | 2.31e+04 |
| Cd-115m | 0.00e+00 | 2.42e+05 | 8.67e+03 | 0.00e+00 | 1.32e+05 | 2.06e+06 | 7.03e+04 |
| Sn-123 | 2.93e+05 | 5.89e+03 | 1.02e+04 | 5.98e+03 | 0.00e+00 | 3.11e+06 | 5.71e+04 |
| Sn-125 | 1.41e+04 | 3.51e+02 | 8.40e+02 | 3.46e+02 | 0.00e+00 | 9.00e+05 | 1.02e+05 |
| Sn-126 | 1.16e+06 | 2.02e+04 | 4.93e+04 | 5.38e+03 | 0.00e+00 | 6.90e+06 | 2.31e+04 |
| Sb-124 | 3.79e+04 | 5.56e+02 | 1.20e+04 | 1.01e+02 | 0.00e+00 | 2.65e+06 | 5.91e+04 |
| Sb-125 | 5.17e+04 | 4.77e+02 | 1.09e+04 | 6.23e+01 | 0.00e+00 | 1.64e+06 | 1.47e+04 |
| Sb-126 | 4.31e+03 | 8.41e+01 | 1.55e+03 | 3.29e+01 | 0.00e+00 | 9.63e+05 | 7.46e+04 |
| Sb-127 | 3.95e+02 | 7.06e+00 | 1.23e+02 | 5.04e+00 | 0.00e+00 | 2.16e+05 | 5.29e+04 |
| Te-125m | 4.76e+03 | 1.99e+03 | 6.58e+02 | 1.62e+03 | 0.00e+00 | 4.47e+05 | 1.29e+04 |
| Te-127 | 2.23e+00 | 9.53e-01 | 4.89e-01 | 1.85e+00 | 4.86e+00 | 1.03e+04 | 2.44e+04 |
| Te-127m | 1.67e+04 | 6.90e+03 | 2.07e+03 | 4.87e+03 | 3.75e+04 | 1.31e+06 | 2.73e+04 |
| Te-129 | 7.88e-02 | 3.47e-02 | 1.88e-02 | 6.75e-02 | 1.75e-01 | 3.00e+03 | 2.63e+04 |
| Te-129m | 1.41e+04 | 6.09e+03 | 2.23e+03 | 5.47e+03 | 3.18e+04 | 1.68e+06 | 6.90e+04 |
| Te-131 | 1.74e-02 | 8.22e-03 | 5.00e-03 | 1.58e-02 | 3.99e-02 | 2.06e+03 | 8.22e+03 |
| Te-131m | 1.07e+02 | 5.50e+01 | 3.63e+01 | 8.93e+01 | 2.65e+02 | 1.99e+05 | 1.19e+05 |
| Te-132 | 3.72e+02 | 2.37e+02 | 1.76e+02 | 2.79e+02 | 1.03e+03 | 3.40e+05 | 4.41e+04 |
| Te-133m | 8.58e-02 | 5.03e-02 | 3.84e-02 | 7.73e-02 | 2.41e-01 | 5.49e+03 | 2.23e+04 |
| Te-134 | 4.45e-02 | 2.86e-02 | 2.35e-02 | 4.07e-02 | 1.34e-01 | 4.10e+03 | 3.54e+03 |
| I-129 | 3.02e+04 | 2.23e+04 | 1.62e+04 | 1.46e+07 | 2.63e+04 | 0.00e+00 | 2.97e+02 |
| I-130 | 6.36e+03 | 1.39e+04 | 5.57e+03 | 1.60e+06 | 1.53e+04 | 0.00e+00 | 1.99e+03 |
| I-131 | 3.79e+04 | 4.44e+04 | 1.96e+04 | 1.48e+07 | 5.18e+04 | 0.00e+00 | 1.06e+03 |
| I-132 | 1.69e+03 | 3.54e+03 | 1.26e+03 | 1.69e+05 | 3.95e+03 | 0.00e+00 | 1.90e+03 |
| I-133 | 1.32e+04 | 1.92e+04 | 5.60e+03 | 3.56e+06 | 2.24e+04 | 0.00e+00 | 2.16e+03 |
| I-134 | 9.21e+02 | 1.88e+03 | 6.65e+02 | 4.45e+04 | 2.09e+03 | 0.00e+00 | 1.29e+03 |
| I-135 | 3.86e+03 | 7.60e+03 | 2.77e+03 | 6.96e+05 | 8.47e+03 | 0.00e+00 | 1.83e+03 |
| Cs-134 | 3.96e+05 | 7.03e+05 | 7.45e+04 | 0.00e+00 | 1.90e+05 | 7.97e+04 | 1.33e+03 |
| Cs-134m | 1.85e+02 | 2.94e+02 | 1.55e+02 | 0.00e+00 | 1.19e+02 | 2.80e+01 | 1.62e+02 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

Ri factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Inhalation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Cs-135 | 1.40e+05 | 1.21e+05 | 6.62e+03 | 0.00e+00 | 3.61e+04 | 1.41e+04 | 3.05e+02 |
| Cs-136 | 4.83e+04 | 1.35e+05 | 5.29e+04 | 0.00e+00 | 5.64e+04 | 1.18e+04 | 1.43e+03 |
| Cs-137 | 5.49e+05 | 6.12e+05 | 4.55e+04 | 0.00e+00 | 1.72e+05 | 7.13e+04 | 1.33e+03 |
| Cs-138 | 5.05e+02 | 7.81e+02 | 3.98e+02 | 0.00e+00 | 4.10e+02 | 6.54e+01 | 8.76e+02 |
| Cs-139 | 3.25e+02 | 4.24e+02 | 1.71e+02 | 0.00e+00 | 2.31e+02 | 3.54e+01 | 1.86e+01 |
| Ba-139 | 1.48e+00 | 9.84e-04 | 4.30e-02 | 0.00e+00 | 5.92e-04 | 5.95e+03 | 5.10e+04 |
| Ba-140 | 5.60e+04 | 5.60e+01 | 2.90e+03 | 0.00e+00 | 1.34e+01 | 1.60e+06 | 3.84e+04 |
| Ba-141 | 1.57e-01 | 1.08e-04 | 4.97e-03 | 0.00e+00 | 6.50e-05 | 2.97e+03 | 4.75e+03 |
| Ba-142 | 3.98e-02 | 3.30e-05 | 1.96e-03 | 0.00e+00 | 1.90e-05 | 1.55e+03 | 6.93e+02 |
| La-140 | 5.05e+02 | 2.00e+02 | 5.15e+01 | 0.00e+00 | 0.00e+00 | 1.68e+05 | 8.48e+04 |
| La-141 | 6.79e+00 | 1.96e+00 | 3.43e-01 | 0.00e+00 | 0.00e+00 | 1.71e+04 | 8.34e+04 |
| La-142 | 1.03e+00 | 3.77e-01 | 9.04e-02 | 0.00e+00 | 0.00e+00 | 8.22e+03 | 5.95e+04 |
| Ce-141 | 2.77e+04 | 1.67e+04 | 1.99e+03 | 0.00e+00 | 5.25e+03 | 5.17e+05 | 2.16e+04 |
| Ce-143 | 2.93e+02 | 1.93e+02 | 2.21e+01 | 0.00e+00 | 5.64e+01 | 1.16e+05 | 4.97e+04 |
| Ce-144 | 3.19e+06 | 1.21e+06 | 1.76e+05 | 0.00e+00 | 5.38e+05 | 9.84e+06 | 1.48e+05 |
| Pr-143 | 1.40e+04 | 5.24e+03 | 6.99e+02 | 0.00e+00 | 1.97e+03 | 4.33e+05 | 3.72e+04 |
| Pr-144 | 4.79e-02 | 1.85e-02 | 2.41e-03 | 0.00e+00 | 6.72e-03 | 1.61e+03 | 4.28e+03 |
| Nd-147 | 7.94e+03 | 8.13e+03 | 5.00e+02 | 0.00e+00 | 3.15e+03 | 3.22e+05 | 3.12e+04 |
| Pm-147 | 5.47e+05 | 4.30e+04 | 2.18e+04 | 0.00e+00 | 6.90e+04 | 6.37e+05 | 8.05e+03 |
| Pm-148 | 4.68e+03 | 6.75e+02 | 3.42e+02 | 0.00e+00 | 8.06e+02 | 4.48e+05 | 8.46e+04 |
| Pm-148m | 7.00e+04 | 1.74e+04 | 1.39e+04 | 0.00e+00 | 2.03e+04 | 1.71e+06 | 4.72e+04 |
| Pm-149 | 4.34e+02 | 5.71e+01 | 2.49e+01 | 0.00e+00 | 6.94e+01 | 9.10e+04 | 4.21e+04 |
| Pm-151 | 1.05e+02 | 1.54e+01 | 7.77e+00 | 0.00e+00 | 1.82e+01 | 4.55e+04 | 3.61e+04 |
| Sm-151 | 4.73e+05 | 9.03e+04 | 2.28e+04 | 0.00e+00 | 7.34e+04 | 4.17e+05 | 4.84e+03 |
| Sm-153 | 2.14e+02 | 1.65e+02 | 1.27e+01 | 0.00e+00 | 3.46e+01 | 5.18e+04 | 2.70e+04 |
| Eu-152 | 1.10e+06 | 2.48e+05 | 2.41e+05 | 0.00e+00 | 8.32e+05 | 2.07e+06 | 1.38e+04 |
| Eu-154 | 4.14e+06 | 4.84e+05 | 3.43e+05 | 0.00e+00 | 1.60e+06 | 4.27e+06 | 3.98e+04 |
| Eu-155 | 8.36e+05 | 8.01e+04 | 4.84e+04 | 0.00e+00 | 2.21e+05 | 7.28e+05 | 7.27e+04 |
| Eu-156 | 2.18e+04 | 1.34e+04 | 2.16e+03 | 0.00e+00 | 6.27e+03 | 8.57e+05 | 5.80e+04 |
| Tb-160 | 1.57e+05 | 0.00e+00 | 1.96e+04 | 0.00e+00 | 4.48e+04 | 1.55e+06 | 3.00e+04 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

Ri factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Inhalation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ho-166m | 2.03e+06 | 4.30e+05 | 3.51e+05 | 0.00e+00 | 5.91e+05 | 2.87e+06 | 2.31e+04 |
| W-181 | 6.80e+01 | 2.04e+01 | 2.34e+00 | 0.00e+00 | 0.00e+00 | 1.86e+04 | 3.68e+02 |
| W-185 | 2.20e+03 | 6.76e+02 | 7.81e+01 | 0.00e+00 | 0.00e+00 | 6.27e+05 | 1.57e+04 |
| W-187 | 1.30e+01 | 9.02e+00 | 3.12e+00 | 0.00e+00 | 0.00e+00 | 3.96e+04 | 3.56e+04 |
| Pb-210 | 1.21e+08 | 2.83e+07 | 4.80e+06 | 0.00e+00 | 9.59e+07 | 2.46e+08 | 2.20e+03 |
| Bi-210 | 2.88e+03 | 1.86e+04 | 1.65e+03 | 0.00e+00 | 1.44e+05 | 1.39e+07 | 4.58e+04 |
| Po-210 | 4.17e+06 | 7.88e+06 | 9.97e+05 | 0.00e+00 | 1.82e+07 | 3.36e+08 | 6.10e+04 |
| Ra-223 | 2.18e+06 | 3.16e+03 | 4.37e+05 | 0.00e+00 | 5.82e+04 | 3.15e+08 | 4.26e+05 |
| Ra-224 | 2.48e+05 | 5.60e+02 | 4.96e+04 | 0.00e+00 | 1.02e+04 | 1.11e+08 | 4.79e+05 |
| Ra-225 | 3.60e+06 | 4.03e+03 | 7.18e+05 | 0.00e+00 | 7.43e+04 | 3.60e+08 | 4.02e+05 |
| Ra-226 | 3.47e+08 | 2.04e+04 | 2.87e+08 | 0.00e+00 | 4.12e+05 | 1.10e+09 | 4.27e+05 |
| Ra-228 | 2.24e+08 | 1.07e+04 | 2.52e+08 | 0.00e+00 | 2.14e+05 | 1.53e+09 | 7.27e+04 |
| Ac-225 | 5.17e+06 | 6.61e+06 | 3.47e+05 | 0.00e+00 | 4.89e+05 | 2.74e+08 | 3.79e+05 |
| Ac-227 | 7.41e+09 | 1.23e+09 | 4.59e+08 | 0.00e+00 | 2.60e+08 | 2.27e+09 | 7.38e+04 |
| Th-227 | 2.55e+06 | 4.24e+04 | 7.34e+04 | 0.00e+00 | 1.58e+05 | 4.58e+08 | 4.94e+05 |
| Th-228 | 1.18e+09 | 1.54e+07 | 4.00e+07 | 0.00e+00 | 7.85e+07 | 6.51e+09 | 5.07e+05 |
| Th-229 | 3.19e+10 | 8.32e+08 | 5.33e+08 | 0.00e+00 | 1.30e+09 | 1.78e+10 | 7.03e+04 |
| Th-230 | 4.84e+09 | 2.51e+08 | 1.35e+08 | 0.00e+00 | 1.23e+09 | 3.05e+09 | 5.42e+04 |
| Th-232 | 5.40e+09 | 2.14e+08 | 3.21e+06 | 0.00e+00 | 1.06e+09 | 2.93e+09 | 4.61e+04 |
| Th-234 | 1.86e+04 | 1.00e+03 | 5.38e+02 | 0.00e+00 | 3.78e+03 | 2.27e+06 | 1.04e+05 |
| Pa-231 | 1.27e+10 | 4.20e+08 | 5.07e+08 | 0.00e+00 | 2.27e+09 | 5.39e+08 | 6.45e+04 |
| Pa-233 | 9.58e+03 | 1.85e+03 | 1.67e+03 | 0.00e+00 | 5.15e+03 | 3.07e+05 | 1.27e+04 |
| U-232 | 3.60e+08 | 0.00e+00 | 2.98e+07 | 0.00e+00 | 3.36e+07 | 2.09e+09 | 6.10e+04 |
| U-233 | 7.62e+07 | 0.00e+00 | 5.36e+06 | 0.00e+00 | 1.53e+07 | 4.98e+08 | 5.64e+04 |
| U-234 | 7.31e+07 | 0.00e+00 | 5.25e+06 | 0.00e+00 | 1.50e+07 | 4.89e+08 | 5.53e+04 |
| U-235 | 7.01e+07 | 0.00e+00 | 4.93e+06 | 0.00e+00 | 1.41e+07 | 4.59e+08 | 7.03e+04 |
| U-236 | 7.01e+07 | 0.00e+00 | 5.04e+06 | 0.00e+00 | 1.44e+07 | 4.69e+08 | 5.19e+04 |
| U-237 | 4.55e+02 | 0.00e+00 | 1.21e+02 | 0.00e+00 | 1.13e+03 | 1.28e+05 | 1.83e+04 |
| U-238 | 6.71e+07 | 0.00e+00 | 4.61e+06 | 0.00e+00 | 1.32e+07 | 4.28e+08 | 4.96e+04 |
| Np-237 | 4.03e+09 | 2.39e+09 | 1.76e+08 | 0.00e+00 | 1.08e+09 | 4.89e+08 | 7.14e+04 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

Ri factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Inhalation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Np-238 | 3.74e+03 | 8.47e+02 | 5.82e+01 | 0.00e+00 | 2.06e+02 | 1.29e+05 | 3.61e+04 |
| Np-239 | 3.71e+02 | 2.98e+02 | 1.88e+01 | 0.00e+00 | 6.62e+01 | 5.95e+04 | 2.49e+04 |
| Pu-238 | 3.77e+09 | 2.35e+09 | 1.78e+08 | 0.00e+00 | 6.50e+08 | 1.26e+09 | 6.57e+04 |
| Pu-239 | 4.10e+09 | 2.46e+09 | 1.88e+08 | 0.00e+00 | 6.93e+08 | 1.19e+09 | 5.99e+04 |
| Pu-240 | 4.10e+09 | 2.45e+09 | 1.88e+08 | 0.00e+00 | 6.92e+08 | 1.19e+09 | 6.10e+04 |
| Pu-241 | 1.18e+08 | 2.59e+07 | 4.35e+06 | 0.00e+00 | 1.61e+07 | 1.07e+06 | 1.26e+03 |
| Pu-242 | 3.81e+09 | 2.37e+09 | 1.81e+08 | 0.00e+00 | 6.68e+08 | 1.14e+09 | 5.88e+04 |
| Pu-244 | 4.44e+09 | 2.72e+09 | 2.07e+08 | 0.00e+00 | 7.64e+08 | 1.31e+09 | 8.76e+04 |
| Am-241 | 4.41e+09 | 2.73e+09 | 1.83e+08 | 0.00e+00 | 1.11e+09 | 5.68e+08 | 6.69e+04 |
| Am-242m | 4.55e+09 | 2.60e+09 | 1.89e+08 | 0.00e+00 | 1.12e+09 | 2.30e+08 | 8.41e+04 |
| Am-243 | 4.34e+09 | 2.63e+09 | 1.78e+08 | 0.00e+00 | 1.08e+09 | 5.39e+08 | 7.84e+04 |
| Cm-242 | 1.79e+08 | 1.21e+08 | 7.98e+06 | 0.00e+00 | 2.37e+07 | 4.16e+08 | 7.14e+04 |
| Cm-243 | 3.46e+09 | 2.13e+09 | 1.48e+08 | 0.00e+00 | 5.47e+08 | 5.94e+08 | 7.03e+04 |
| Cm-244 | 2.90e+09 | 1.78e+09 | 1.24e+08 | 0.00e+00 | 4.49e+08 | 5.71e+08 | 6.80e+04 |
| Cm-245 | 4.51e+09 | 2.74e+09 | 1.90e+08 | 0.00e+00 | 7.32e+08 | 5.49e+08 | 6.34e+04 |
| Cm-246 | 4.48e+09 | 2.74e+09 | 1.90e+08 | 0.00e+00 | 7.32e+08 | 5.59e+08 | 6.23e+04 |
| Cm-247 | 4.35e+09 | 2.70e+09 | 1.86e+08 | 0.00e+00 | 7.21e+08 | 5.49e+08 | 8.19e+04 |
| Cm-248 | 3.61e+10 | 2.23e+10 | 1.54e+09 | 0.00e+00 | 5.94e+09 | 4.52e+09 | 1.32e+06 |
| Cf-252 | 3.32e+09 | 0.00e+00 | 1.41e+08 | 0.00e+00 | 0.00e+00 | 1.92e+09 | 2.59e+05 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

Ri factors for all age groups by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Ground Plane Exposure Pathway Ri

| Nuclide | Organ Dose Conversion Factors | |
|---|---|---|
| | T. Body | Skin |
| H-3 | 0.00e+00 | 0.00e+00 |
| Be-10 | 0.00e+00 | 0.00e+00 |
| C-14 | 0.00e+00 | 0.00e+00 |
| N-13 | 4.02e+04 | 4.66e+04 |
| F-18 | 3.96e+05 | 4.66e+05 |
| Na-22 | 1.14e+10 | 1.28e+10 |
| Na-24 | 1.19e+07 | 1.39e+07 |
| P-32 | 0.00e+00 | 0.00e+00 |
| Ca-41 | 9.89e+09 | 1.16e+10 |
| Sc-46 | 8.33e+08 | 9.61e+08 |
| Cr-51 | 4.66e+06 | 5.51e+06 |
| Mn-54 | 1.39e+09 | 1.63e+09 |
| Mn-56 | 9.02e+05 | 1.07e+06 |
| Fe-55 | 0.00e+00 | 0.00e+00 |
| Fe-59 | 2.73e+08 | 3.21e+08 |
| Co-57 | 1.88e+08 | 2.06e+08 |
| Co-58 | 3.79e+08 | 4.44e+08 |
| Co-60 | 2.15e+10 | 2.53e+10 |
| Ni-59 | 0.00e+00 | 0.00e+00 |
| Ni-63 | 0.00e+00 | 0.00e+00 |
| Ni-65 | 2.97e+05 | 3.45e+05 |
| Cu-64 | 6.07e+05 | 6.88e+05 |
| Zn-65 | 7.47e+08 | 8.59e+08 |
| Zn-69 | 0.00e+00 | 0.00e+00 |
| Zn-69m | 1.27e+06 | 1.49e+06 |
| Se-79 | 0.00e+00 | 0.00e+00 |
| Br-82 | 2.13e+07 | 2.47e+07 |
| Br-83 | 4.87e+03 | 7.08e+03 |
| Br-84 | 2.03e+05 | 2.36e+05 |
| Br-85 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec.

Ri factors for all age groups by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Ground Plane Exposure Pathway Ri

| Nuclide | Organ Dose Conversion Factors | |
|---|---|---|
| | T. Body | Skin |
| Rb-86 | 8.99e+06 | 1.03e+07 |
| Rb-87 | 0.00e+00 | 0.00e+00 |
| Rb-88 | 3.31e+04 | 3.78e+04 |
| Rb-89 | 1.23e+05 | 1.48e+05 |
| Sr-89 | 2.16e+04 | 2.51e+04 |
| Sr-90 | 0.00e+00 | 0.00e+00 |
| Sr-91 | 2.15e+06 | 2.51e+06 |
| Sr-92 | 7.77e+05 | 8.63e+05 |
| Y-90 | 4.49e+03 | 5.31e+03 |
| Y-91 | 1.07e+06 | 1.21e+06 |
| Y-91m | 1.00e+05 | 1.16e+05 |
| Y-92 | 1.80e+05 | 2.14e+05 |
| Y-93 | 1.83e+05 | 2.51e+05 |
| Zr-93 | 0.00e+00 | 0.00e+00 |
| Zr-95 | 2.45e+08 | 2.84e+08 |
| Zr-97 | 2.96e+06 | 3.44e+06 |
| Nb-93m | 1.66e+06 | 2.03e+08 |
| Nb-95 | 1.37e+08 | 1.61e+08 |
| Nb-97 | 1.80e+05 | 2.12e+05 |
| Mo-93 | 6.63e+07 | 2.70e+09 |
| Mo-99 | 3.99e+06 | 4.63e+06 |
| Tc-101 | 2.04e+04 | 2.26e+04 |
| Tc-99 | 0.00e+00 | 0.00e+00 |
| Tc-99m | 1.84e+05 | 2.11e+05 |
| Ru-103 | 1.08e+08 | 1.26e+08 |
| Ru-105 | 6.36e+05 | 7.21e+05 |
| Ru-106 | 4.22e+08 | 5.07e+08 |
| Rh-105 | 7.42e+05 | 8.65e+05 |
| Pd-107 | 0.00e+00 | 0.00e+00 |
| Pd-109 | 1.50e+04 | 1.72e+04 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec.

Ri factors for all age groups by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Ground Plane Exposure Pathway Ri

| Nuclide | Organ Dose Conversion Factors | |
|---|---|---|
| | T. Body | Skin |
| Ag-110m | 3.44e+09 | 4.01e+09 |
| Ag-111 | 1.02e+06 | 1.20e+06 |
| Cd-113m | 4.77e+06 | 5.39e+06 |
| Cd-115m | 0.00e+00 | 0.00e+00 |
| Sn-123 | 0.00e+00 | 6.37e+09 |
| Sn-125 | 4.19e+06 | 4.85e+06 |
| Sn-126 | 2.61e+10 | 2.90e+10 |
| Sb-124 | 5.98e+08 | 6.90e+08 |
| Sb-125 | 2.34e+09 | 2.64e+09 |
| Sb-126 | 8.50e+07 | 9.55e+07 |
| Sb-127 | 1.69e+07 | 1.95e+07 |
| Te-125m | 1.55e+06 | 2.13e+06 |
| Te-127 | 2.98e+03 | 3.28e+03 |
| Te-127m | 9.16e+04 | 1.08e+05 |
| Te-129 | 2.62e+04 | 3.10e+04 |
| Te-129m | 1.98e+07 | 2.31e+07 |
| Te-131 | 2.92e+04 | 3.45e+07 |
| Te-131m | 8.03e+06 | 9.46e+06 |
| Te-132 | 4.23e+06 | 4.98e+06 |
| Te-133m | 4.41e+05 | 5.00e+05 |
| Te-134 | 2.22e+04 | 2.66e+04 |
| I-129 | 1.31e+09 | 2.18e+09 |
| I-130 | 5.51e+06 | 6.69e+06 |
| I-131 | 1.72e+07 | 2.09e+07 |
| I-132 | 1.25e+06 | 1.46e+06 |
| I-133 | 2.45e+06 | 2.98e+06 |
| I-134 | 4.47e+05 | 5.30e+05 |
| I-135 | 2.53e+06 | 2.95e+06 |
| Cs-134 | 6.86e+09 | 8.00e+09 |
| Cs-134m | 5.73e+04 | 6.74e+04 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec.

Ri factors for all age groups by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Ground Plane Exposure Pathway Ri

| Nuclide | Organ Dose Conversion Factors | |
|---|---|---|
| | T. Body | Skin |
| Cs-135 | 0.00e+00 | 0.00e+00 |
| Cs-136 | 1.51e+08 | 1.71e+08 |
| Cs-137 | 1.03e+10 | 1.20e+10 |
| Cs-138 | 3.59e+05 | 4.10e+05 |
| Cs-139 | 3.14e+04 | 3.59e+04 |
| Ba-139 | 1.06e+05 | 1.19e+05 |
| Ba-140 | 2.05e+07 | 2.35e+07 |
| Ba-141 | 4.17e+04 | 4.75e+04 |
| Ba-142 | 4.49e+04 | 5.11e+04 |
| La-140 | 1.92e+07 | 2.18e+07 |
| La-141 | 3.13e+04 | 3.50e+04 |
| La-142 | 7.60e+05 | 9.11e+05 |
| Ce-141 | 1.37e+07 | 1.54e+07 |
| Ce-143 | 2.31e+06 | 2.63e+06 |
| Ce-144 | 6.95e+07 | 8.04e+07 |
| Pr-143 | 0.00e+00 | 0.00e+00 |
| Pr-144 | 1.83e+03 | 2.11e+03 |
| Nd-147 | 8.39e+06 | 1.01e+07 |
| Pm-147 | 0.00e+00 | 0.00e+00 |
| Pm-148 | 1.89e+07 | 2.18e+07 |
| Pm-148m | 4.45e+08 | 2.58e+09 |
| Pm-149 | 4.22e+04 | 4.90e+04 |
| Pm-151 | 1.98e+06 | 2.07e+06 |
| Sm-151 | 1.32e+08 | 5.76e+08 |
| Sm-153 | 4.02e+05 | 4.47e+05 |
| Eu-152 | 1.46e+10 | 1.69e+10 |
| Eu-154 | 2.19e+10 | 2.53e+10 |
| Eu-155 | 1.91e+08 | 2.17e+08 |
| Eu-156 | 8.83e+07 | 1.01e+08 |
| Tb-160 | 4.74e+08 | 5.51e+08 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec.

Ri factors for all age groups by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Ground Plane Exposure Pathway Ri

| Nuclide | Organ Dose Conversion Factors | |
|---|---|---|
| | T. Body | Skin |
| Ho-166m | 2.57e+10 | 2.89e+10 |
| W-181 | 1.94e+05 | 2.59e+05 |
| W-185 | 0.00e+00 | 0.00e+00 |
| W-187 | 2.35e+06 | 2.73e+06 |
| Pb-210 | 2.95e+07 | 3.86e+07 |
| Bi-210 | 0.00e+00 | 0.00e+00 |
| Po-210 | 5.70e+03 | 6.54e+03 |
| Ra-223 | 1.31e+07 | 1.57e+07 |
| Ra-224 | 2.49e+07 | 2.80e+07 |
| Ra-225 | 9.50e+05 | 1.36e+06 |
| Ra-226 | 1.85e+10 | 2.14e+10 |
| Ra-228 | 1.61e+10 | 1.88e+10 |
| Ac-225 | 1.22e+07 | 1.38e+07 |
| Ac-227 | 4.61e+09 | 5.54e+09 |
| Th-227 | 7.21e+06 | 8.91e+06 |
| Th-228 | 4.72e+09 | 5.31e+09 |
| Th-229 | 6.38e+09 | 7.83e+09 |
| Th-230 | 1.89e+10 | 2.18e+10 |
| Th-232 | 8.70e+09 | 1.16e+10 |
| Th-234 | 2.03e+06 | 2.39e+06 |
| Pa-231 | 6.38e+09 | 7.83e+09 |
| Pa-233 | 2.72e+07 | 3.14e+07 |
| U-232 | 7.00e+06 | 7.27e+07 |
| U-233 | 6.67e+09 | 8.12e+09 |
| U-234 | 1.83e+06 | 4.61e+08 |
| U-235 | 9.28e+09 | 1.16e+10 |
| U-236 | 6.09e+04 | 5.22e+07 |
| U-237 | 5.16e+06 | 6.71e+06 |
| U-238 | 3.19e+08 | 4.35e+08 |
| Np-237 | 4.06e+09 | 4.64e+09 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec.

Ri factors for all age groups by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Ground Plane Exposure Pathway Ri

| Nuclide | Organ Dose Conversion Factors | |
|---|---|---|
| | T. Body | Skin |
| Np-238 | 4.54e+06 | 5.19e+06 |
| Np-239 | 1.71e+06 | 1.98e+06 |
| Pu-238 | 3.56e+06 | 4.92e+07 |
| Pu-239 | 2.29e+06 | 2.23e+07 |
| Pu-240 | 3.77e+06 | 5.22e+07 |
| Pu-241 | 9.66e+06 | 1.43e+07 |
| Pu-242 | 3.19e+06 | 4.64e+07 |
| Pu-244 | 2.60e+09 | 2.79e+09 |
| Am-241 | 1.98e+08 | 2.86e+08 |
| Am-242m | 7.29e+07 | 5.05e+08 |
| Am-243 | 3.77e+09 | 4.35e+09 |
| Cm-242 | 6.85e+05 | 2.87e+06 |
| Cm-243 | 5.59e+09 | 7.05e+09 |
| Cm-244 | 6.40e+06 | 3.97e+07 |
| Cm-245 | 2.75e+09 | 3.48e+09 |
| Cm-246 | 2.90e+06 | 4.35e+07 |
| Cm-247 | 6.38e+09 | 7.54e+09 |
| Cm-248 | 1.98e+10 | 1.52e+10 |
| Cf-252 | 4.46e+10 | 4.87e+10 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec.

# COW'S MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Cow's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| H-3 | 0.00e+00 | 4.35e+02 | 4.35e+02 | 4.35e+02 | 4.35e+02 | 4.35e+02 | 4.35e+02 |
| Be-10 | 2.46e+06 | 3.79e+05 | 6.14e+04 | 0.00e+00 | 2.87e+05 | 0.00e+00 | 2.07e+07 |
| C-14 | 2.63e+08 | 5.27e+07 | 5.27e+07 | 5.27e+07 | 5.27e+07 | 5.27e+07 | 5.27e+07 |
| N-13 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| F-18 | 4.65e-03 | 0.00e+00 | 5.15e-04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.38e-04 |
| Na-22 | 5.29e+09 | 5.29e+09 | 5.29e+09 | 5.29e+09 | 5.29e+09 | 5.29e+09 | 5.29e+09 |
| Na-24 | 2.44e+06 | 2.44e+06 | 2.44e+06 | 2.44e+06 | 2.44e+06 | 2.44e+06 | 2.44e+06 |
| P-32 | 1.71e+10 | 1.06e+09 | 6.61e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.92e+09 |
| Ca-41 | 1.14e+10 | 0.00e+00 | 1.24e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.14e+07 |
| Sc-46 | 1.79e+02 | 3.48e+02 | 1.01e+02 | 0.00e+00 | 3.25e+02 | 0.00e+00 | 1.70e+06 |
| Cr-51 | 0.00e+00 | 0.00e+00 | 2.86e+04 | 1.71e+04 | 6.30e+03 | 3.79e+04 | 7.19e+06 |
| Mn-54 | 0.00e+00 | 8.41e+06 | 1.61e+06 | 0.00e+00 | 2.50e+06 | 0.00e+00 | 2.58e+07 |
| Mn-56 | 0.00e+00 | 4.15e-03 | 7.37e-04 | 0.00e+00 | 5.27e-03 | 0.00e+00 | 1.33e-01 |
| Fe-55 | 2.51e+07 | 1.73e+07 | 4.05e+06 | 0.00e+00 | 0.00e+00 | 9.68e+06 | 9.95e+06 |
| Fe-59 | 2.97e+07 | 6.98e+07 | 2.68e+07 | 0.00e+00 | 0.00e+00 | 1.95e+07 | 2.33e+08 |
| Co-57 | 0.00e+00 | 1.28e+06 | 2.13e+06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.25e+07 |
| Co-58 | 0.00e+00 | 4.71e+06 | 1.06e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 9.55e+07 |
| Co-60 | 0.00e+00 | 1.64e+07 | 3.62e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.08e+08 |
| Ni-59 | 5.05e+08 | 1.73e+08 | 8.44e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.57e+07 |
| Ni-63 | 6.73e+09 | 4.66e+08 | 2.26e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 9.73e+07 |
| Ni-65 | 3.76e-01 | 4.88e-02 | 2.23e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.24e+00 |
| Cu-64 | 0.00e+00 | 2.39e+04 | 1.12e+04 | 0.00e+00 | 6.03e+04 | 0.00e+00 | 2.04e+06 |
| Zn-65 | 1.37e+09 | 4.37e+09 | 1.97e+09 | 0.00e+00 | 2.92e+09 | 0.00e+00 | 2.75e+09 |
| Zn-69 | 2.18e-12 | 4.17e-12 | 2.90e-13 | 0.00e+00 | 2.71e-12 | 0.00e+00 | 6.26e-13 |
| Zn-69m | 1.81e+05 | 4.35e+05 | 3.98e+04 | 0.00e+00 | 2.64e+05 | 0.00e+00 | 2.66e+07 |
| Se-79 | 0.00e+00 | 9.15e+08 | 1.53e+08 | 0.00e+00 | 1.58e+09 | 0.00e+00 | 1.87e+08 |
| Br-82 | 0.00e+00 | 0.00e+00 | 3.23e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.70e+07 |
| Br-83 | 0.00e+00 | 0.00e+00 | 9.87e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.42e-01 |
| Br-84 | 0.00e+00 | 0.00e+00 | 1.73e-23 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.36e-28 |
| Br-85 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

Ri factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Cow's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Rb-86 | 0.00e+00 | 2.59e+09 | 1.21e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.12e+08 |
| Rb-87 | 0.00e+00 | 2.85e+09 | 9.92e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.34e+08 |
| Rb-88 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Rb-89 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sr-89 | 1.45e+09 | 0.00e+00 | 4.16e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.33e+08 |
| Sr-90 | 5.38e+10 | 0.00e+00 | 1.08e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.35e+09 |
| Sr-91 | 2.90e+04 | 0.00e+00 | 1.17e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.38e+05 |
| Sr-92 | 4.95e-01 | 0.00e+00 | 2.14e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 9.81e+00 |
| Y-90 | 7.09e+01 | 0.00e+00 | 1.90e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.52e+05 |
| Y-91 | 8.59e+03 | 0.00e+00 | 2.30e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.73e+06 |
| Y-91m | 6.27e-20 | 0.00e+00 | 2.43e-21 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.84e-19 |
| Y-92 | 5.64e-05 | 0.00e+00 | 1.65e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 9.88e-01 |
| Y-93 | 2.24e-01 | 0.00e+00 | 6.19e-03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.11e+03 |
| Zr-93 | 1.62e+03 | 9.04e+01 | 4.21e+01 | 0.00e+00 | 3.43e+02 | 0.00e+00 | 9.39e+04 |
| Zr-95 | 9.43e+02 | 3.03e+02 | 2.05e+02 | 0.00e+00 | 4.75e+02 | 0.00e+00 | 9.59e+05 |
| Zr-97 | 4.34e-01 | 8.76e-02 | 4.01e-02 | 0.00e+00 | 1.32e-01 | 0.00e+00 | 2.71e+04 |
| Nb-93m | 4.91e+05 | 1.60e+05 | 3.95e+04 | 0.00e+00 | 1.84e+05 | 0.00e+00 | 7.40e+07 |
| Nb-95 | 8.26e+04 | 4.59e+04 | 2.47e+04 | 0.00e+00 | 4.54e+04 | 0.00e+00 | 2.79e+08 |
| Nb-97 | 6.58e-12 | 1.66e-12 | 6.07e-13 | 0.00e+00 | 1.94e-12 | 0.00e+00 | 6.14e-09 |
| Mo-93 | 0.00e+00 | 4.35e+08 | 1.18e+07 | 0.00e+00 | 1.23e+08 | 0.00e+00 | 7.07e+07 |
| Mo-99 | 0.00e+00 | 2.48e+07 | 4.72e+06 | 0.00e+00 | 5.61e+07 | 0.00e+00 | 5.74e+07 |
| Tc-101 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Tc-99 | 2.42e+07 | 3.59e+07 | 9.70e+06 | 0.00e+00 | 4.52e+08 | 3.05e+06 | 1.17e+09 |
| Tc-99m | 3.34e+00 | 9.44e+00 | 1.20e+02 | 0.00e+00 | 1.43e+02 | 4.63e+00 | 5.59e+03 |
| Ru-103 | 1.02e+03 | 0.00e+00 | 4.39e+02 | 0.00e+00 | 3.89e+03 | 0.00e+00 | 1.19e+05 |
| Ru-105 | 8.64e-04 | 0.00e+00 | 3.41e-04 | 0.00e+00 | 1.12e-02 | 0.00e+00 | 5.29e-01 |
| Ru-106 | 2.04e+04 | 0.00e+00 | 2.58e+03 | 0.00e+00 | 3.94e+04 | 0.00e+00 | 1.32e+06 |
| Rh-105 | 3.46e+05 | 2.53e+05 | 1.67e+05 | 0.00e+00 | 1.08e+06 | 0.00e+00 | 4.03e+07 |
| Pd-107 | 0.00e+00 | 1.14e+07 | 7.26e+05 | 0.00e+00 | 1.02e+08 | 0.00e+00 | 7.04e+07 |
| Pd-109 | 0.00e+00 | 4.49e+04 | 1.01e+04 | 0.00e+00 | 2.56e+05 | 0.00e+00 | 4.98e+06 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# COW'S MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Cow's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ag-110m | 5.82e+07 | 5.39e+07 | 3.20e+07 | 0.00e+00 | 1.06e+08 | 0.00e+00 | 2.20e+10 |
| Ag-111 | 6.47e+06 | 2.71e+06 | 1.35e+06 | 0.00e+00 | 8.74e+06 | 0.00e+00 | 4.97e+09 |
| Cd-113m | 0.00e+00 | 2.94e+06 | 9.43e+04 | 0.00e+00 | 3.24e+06 | 0.00e+00 | 2.37e+07 |
| Cd-115m | 0.00e+00 | 1.26e+06 | 4.02e+04 | 0.00e+00 | 9.99e+05 | 0.00e+00 | 5.30e+07 |
| Sn-123 | 5.36e+08 | 8.88e+06 | 1.31e+07 | 7.55e+06 | 0.00e+00 | 0.00e+00 | 1.09e+09 |
| Sn-125 | 5.68e+07 | 1.14e+06 | 2.58e+06 | 9.47e+05 | 0.00e+00 | 0.00e+00 | 7.09e+08 |
| Sn-126 | 1.63e+09 | 3.23e+07 | 4.64e+07 | 9.51e+06 | 0.00e+00 | 0.00e+00 | 4.69e+08 |
| Sb-124 | 2.57e+07 | 4.86e+05 | 1.02e+07 | 6.24e+04 | 0.00e+00 | 2.00e+07 | 7.31e+08 |
| Sb-125 | 2.04e+07 | 2.28e+05 | 4.86e+06 | 2.08e+04 | 0.00e+00 | 1.58e+07 | 2.25e+08 |
| Sb-126 | 5.63e+06 | 1.15e+05 | 2.03e+06 | 3.45e+04 | 0.00e+00 | 3.45e+06 | 4.60e+08 |
| Sb-127 | 4.53e+05 | 9.93e+03 | 1.74e+05 | 5.45e+03 | 0.00e+00 | 2.69e+05 | 1.04e+08 |
| Te-125m | 1.63e+07 | 5.90e+06 | 2.18e+06 | 4.90e+06 | 6.63e+07 | 0.00e+00 | 6.50e+07 |
| Te-127 | 6.56e+02 | 2.35e+02 | 1.42e+02 | 4.86e+02 | 2.67e+03 | 0.00e+00 | 5.17e+04 |
| Te-127m | 4.58e+07 | 1.64e+07 | 5.58e+06 | 1.17e+07 | 1.86e+08 | 0.00e+00 | 1.53e+08 |
| Te-129 | 2.92e-10 | 1.10e-10 | 7.11e-11 | 2.24e-10 | 1.23e-09 | 0.00e+00 | 2.20e-10 |
| Te-129m | 6.02e+07 | 2.25e+07 | 9.53e+06 | 2.07e+07 | 2.51e+08 | 0.00e+00 | 3.03e+08 |
| Te-131 | 3.95e-33 | 1.65e-33 | 1.25e-33 | 3.25e-33 | 1.73e-32 | 0.00e+00 | 5.60e-34 |
| Te-131m | 3.62e+05 | 1.77e+05 | 1.47e+05 | 2.80e+05 | 1.79e+06 | 0.00e+00 | 1.76e+07 |
| Te-132 | 2.40e+06 | 1.55e+06 | 1.46e+06 | 1.72e+06 | 1.50e+07 | 0.00e+00 | 7.35e+07 |
| Te-133m | 2.19e-13 | 1.28e-13 | 1.24e-13 | 1.86e-13 | 1.27e-12 | 0.00e+00 | 4.40e-14 |
| Te-134 | 9.41e-19 | 6.16e-19 | 3.78e-19 | 8.22e-19 | 5.95e-18 | 0.00e+00 | 1.04e-21 |
| I-129 | 7.58e+08 | 6.51e+08 | 2.14e+09 | 1.68e+12 | 1.40e+09 | 0.00e+00 | 1.03e+08 |
| I-130 | 4.21e+05 | 1.24e+06 | 4.90e+05 | 1.05e+08 | 1.94e+06 | 0.00e+00 | 1.07e+06 |
| I-131 | 2.96e+08 | 4.24e+08 | 2.43e+08 | 1.39e+11 | 7.26e+08 | 0.00e+00 | 1.12e+08 |
| I-132 | 1.67e-01 | 4.47e-01 | 1.56e-01 | 1.56e+01 | 7.12e-01 | 0.00e+00 | 8.39e-02 |
| I-133 | 3.88e+06 | 6.74e+06 | 2.06e+06 | 9.91e+08 | 1.18e+07 | 0.00e+00 | 6.06e+06 |
| I-134 | 2.11e-12 | 5.72e-12 | 2.05e-12 | 9.92e-11 | 9.10e-12 | 0.00e+00 | 4.99e-15 |
| I-135 | 1.29e+04 | 3.38e+04 | 1.25e+04 | 2.23e+06 | 5.42e+04 | 0.00e+00 | 3.82e+04 |
| Cs-134 | 5.65e+09 | 1.34e+10 | 1.10e+10 | 0.00e+00 | 4.35e+09 | 1.44e+09 | 2.35e+08 |
| Cs-134m | 1.76e-01 | 3.70e-01 | 1.89e-01 | 0.00e+00 | 2.01e-01 | 3.16e-02 | 1.31e-01 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

Ri factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Cow's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Cs-135 | 1.81e+09 | 1.67e+09 | 7.41e+08 | 0.00e+00 | 6.32e+08 | 1.89e+08 | 3.90e+07 |
| Cs-136 | 2.63e+08 | 1.04e+09 | 7.48e+08 | 0.00e+00 | 5.78e+08 | 7.93e+07 | 1.18e+08 |
| Cs-137 | 7.38e+09 | 1.01e+10 | 6.61e+09 | 0.00e+00 | 3.43e+09 | 1.14e+09 | 1.95e+08 |
| Cs-138 | 9.72e-24 | 1.92e-23 | 9.50e-24 | 0.00e+00 | 1.41e-23 | 1.39e-24 | 8.18e-29 |
| Cs-139 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-139 | 4.54e-08 | 3.24e-11 | 1.33e-09 | 0.00e+00 | 3.03e-11 | 1.84e-11 | 8.06e-08 |
| Ba-140 | 2.69e+07 | 3.38e+04 | 1.76e+06 | 0.00e+00 | 1.15e+04 | 1.93e+04 | 5.54e+07 |
| Ba-141 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-142 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| La-140 | 4.52e+00 | 2.28e+00 | 6.01e-01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.67e+05 |
| La-141 | 3.00e-05 | 9.31e-06 | 1.52e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.11e+00 |
| La-142 | 1.90e-11 | 8.66e-12 | 2.16e-12 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.32e-08 |
| Ce-141 | 4.84e+03 | 3.28e+03 | 3.72e+02 | 0.00e+00 | 1.52e+03 | 0.00e+00 | 1.25e+07 |
| Ce-143 | 4.16e+01 | 3.08e+04 | 3.40e+00 | 0.00e+00 | 1.35e+01 | 0.00e+00 | 1.15e+06 |
| Ce-144 | 3.58e+05 | 1.50e+05 | 1.92e+04 | 0.00e+00 | 8.87e+04 | 0.00e+00 | 1.21e+08 |
| Pr-143 | 1.58e+02 | 6.33e+01 | 7.83e+00 | 0.00e+00 | 3.66e+01 | 0.00e+00 | 6.92e+05 |
| Pr-144 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Nd-147 | 9.42e+01 | 1.09e+02 | 6.51e+00 | 0.00e+00 | 6.36e+01 | 0.00e+00 | 5.22e+05 |
| Pm-147 | 2.87e+03 | 2.70e+02 | 1.09e+02 | 0.00e+00 | 5.10e+02 | 0.00e+00 | 3.40e+05 |
| Pm-148 | 5.93e+01 | 9.85e+00 | 4.96e+00 | 0.00e+00 | 1.86e+01 | 0.00e+00 | 7.74e+05 |
| Pm-148m | 8.57e+02 | 2.22e+02 | 1.70e+02 | 0.00e+00 | 3.35e+02 | 0.00e+00 | 1.88e+06 |
| Pm-149 | 4.28e+00 | 6.05e-01 | 2.47e-01 | 0.00e+00 | 1.14e+00 | 0.00e+00 | 1.13e+05 |
| Pm-151 | 6.47e-01 | 1.09e-01 | 5.48e-02 | 0.00e+00 | 1.94e-01 | 0.00e+00 | 2.99e+04 |
| Sm-151 | 2.67e+03 | 4.60e+02 | 1.10e+02 | 0.00e+00 | 5.14e+02 | 0.00e+00 | 2.03e+05 |
| Sm-153 | 1.99e+00 | 1.66e+00 | 1.21e-01 | 0.00e+00 | 5.36e-01 | 0.00e+00 | 5.92e+04 |
| Eu-152 | 7.51e+03 | 1.71e+03 | 1.50e+03 | 0.00e+00 | 1.06e+04 | 0.00e+00 | 9.86e+05 |
| Eu-154 | 2.38e+04 | 2.92e+03 | 2.08e+03 | 0.00e+00 | 1.40e+04 | 0.00e+00 | 2.12e+06 |
| Eu-155 | 3.25e+03 | 4.61e+02 | 2.97e+02 | 0.00e+00 | 2.13e+03 | 0.00e+00 | 3.62e+05 |
| Eu-156 | 2.52e+02 | 1.95e+02 | 3.14e+01 | 0.00e+00 | 1.30e+02 | 0.00e+00 | 1.33e+06 |
| Tb-160 | 1.49e+03 | 0.00e+00 | 1.86e+02 | 0.00e+00 | 6.16e+02 | 0.00e+00 | 1.37e+06 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

Ri factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Cow's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ho-166m | 1.04e+04 | 3.26e+03 | 2.47e+03 | 0.00e+00 | 4.87e+03 | 0.00e+00 | 9.89e+05 |
| W-181 | 3.39e+04 | 1.11e+04 | 1.18e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.26e+06 |
| W-185 | 1.29e+06 | 4.32e+05 | 4.54e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.99e+07 |
| W-187 | 6.52e+03 | 5.45e+03 | 1.91e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.79e+06 |
| Pb-210 | 7.32e+10 | 2.09e+10 | 2.60e+09 | 0.00e+00 | 5.88e+10 | 0.00e+00 | 1.07e+07 |
| Bi-210 | 3.56e+05 | 2.46e+06 | 2.04e+05 | 0.00e+00 | 2.96e+07 | 0.00e+00 | 3.67e+07 |
| Po-210 | 7.42e+08 | 1.58e+09 | 1.79e+08 | 0.00e+00 | 5.25e+09 | 0.00e+00 | 1.33e+08 |
| Ra-223 | 1.22e+11 | 1.88e+08 | 2.44e+10 | 0.00e+00 | 5.33e+09 | 0.00e+00 | 7.89e+09 |
| Ra-224 | 1.41e+10 | 3.42e+07 | 2.83e+09 | 0.00e+00 | 9.65e+08 | 0.00e+00 | 2.98e+09 |
| Ra-225 | 1.90e+11 | 2.25e+08 | 3.79e+10 | 0.00e+00 | 6.39e+09 | 0.00e+00 | 8.85e+09 |
| Ra-226 | 1.87e+13 | 3.55e+08 | 1.36e+13 | 0.00e+00 | 1.01e+10 | 0.00e+00 | 2.05e+10 |
| Ra-228 | 6.87e+12 | 1.91e+08 | 7.43e+12 | 0.00e+00 | 5.42e+09 | 0.00e+00 | 3.46e+09 |
| Ac-225 | 6.17e+04 | 8.49e+04 | 4.15e+03 | 0.00e+00 | 9.67e+03 | 0.00e+00 | 5.70e+06 |
| Ac-227 | 7.21e+07 | 9.56e+06 | 4.28e+06 | 0.00e+00 | 3.09e+06 | 0.00e+00 | 3.16e+06 |
| Th-227 | 2.80e+05 | 5.06e+03 | 8.06e+03 | 0.00e+00 | 2.88e+04 | 0.00e+00 | 1.10e+07 |
| Th-228 | 1.88e+07 | 3.18e+05 | 6.35e+05 | 0.00e+00 | 1.77e+06 | 0.00e+00 | 2.13e+07 |
| Th-229 | 5.26e+08 | 1.50e+07 | 8.69e+06 | 0.00e+00 | 7.26e+07 | 0.00e+00 | 3.02e+06 |
| Th-230 | 7.96e+07 | 4.52e+06 | 2.20e+06 | 0.00e+00 | 2.18e+07 | 0.00e+00 | 2.33e+06 |
| Th-232 | 8.89e+07 | 3.86e+06 | 5.80e+04 | 0.00e+00 | 1.86e+07 | 0.00e+00 | 1.98e+06 |
| Th-234 | 1.85e+03 | 1.09e+02 | 5.33e+01 | 0.00e+00 | 6.16e+02 | 0.00e+00 | 2.61e+06 |
| Pa-231 | 1.58e+08 | 5.95e+06 | 6.14e+06 | 0.00e+00 | 3.34e+07 | 0.00e+00 | 2.77e+06 |
| Pa-233 | 1.28e+02 | 2.58e+01 | 2.22e+01 | 0.00e+00 | 9.70e+01 | 0.00e+00 | 3.99e+05 |
| U-232 | 1.59e+10 | 0.00e+00 | 1.14e+09 | 0.00e+00 | 1.73e+09 | 0.00e+00 | 2.62e+08 |
| U-233 | 3.37e+09 | 0.00e+00 | 2.04e+08 | 0.00e+00 | 7.84e+08 | 0.00e+00 | 2.42e+08 |
| U-234 | 3.23e+09 | 0.00e+00 | 2.00e+08 | 0.00e+00 | 7.69e+08 | 0.00e+00 | 2.37e+08 |
| U-235 | 3.10e+09 | 0.00e+00 | 1.88e+08 | 0.00e+00 | 7.23e+08 | 0.00e+00 | 3.02e+08 |
| U-236 | 3.10e+09 | 0.00e+00 | 1.92e+08 | 0.00e+00 | 7.38e+08 | 0.00e+00 | 2.23e+08 |
| U-237 | 5.65e+04 | 0.00e+00 | 1.50e+04 | 0.00e+00 | 2.32e+05 | 0.00e+00 | 1.99e+07 |
| U-238 | 2.96e+09 | 0.00e+00 | 1.75e+08 | 0.00e+00 | 6.76e+08 | 0.00e+00 | 2.13e+08 |
| Np-237 | 4.87e+07 | 3.46e+06 | 2.14e+06 | 0.00e+00 | 1.59e+07 | 0.00e+00 | 3.07e+06 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# COW'S MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Cow's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Np-238 | 3.62e+01 | 9.75e-01 | 5.63e-01 | 0.00e+00 | 3.30e+00 | 0.00e+00 | 9.06e+04 |
| Np-239 | 3.68e+00 | 3.61e-01 | 1.99e-01 | 0.00e+00 | 1.13e+00 | 0.00e+00 | 7.41e+04 |
| Pu-238 | 9.73e+06 | 1.23e+06 | 2.64e+05 | 0.00e+00 | 1.13e+06 | 0.00e+00 | 1.13e+06 |
| Pu-239 | 1.12e+07 | 1.35e+06 | 2.95e+05 | 0.00e+00 | 1.25e+06 | 0.00e+00 | 1.03e+06 |
| Pu-240 | 1.12e+07 | 1.34e+06 | 2.95e+05 | 0.00e+00 | 1.25e+06 | 0.00e+00 | 1.05e+06 |
| Pu-241 | 2.42e+05 | 1.15e+04 | 5.12e+03 | 0.00e+00 | 2.36e+04 | 0.00e+00 | 2.16e+04 |
| Pu-242 | 1.04e+07 | 1.30e+06 | 2.84e+05 | 0.00e+00 | 1.21e+06 | 0.00e+00 | 1.01e+06 |
| Pu-244 | 1.21e+07 | 1.49e+06 | 3.26e+05 | 0.00e+00 | 1.38e+06 | 0.00e+00 | 1.50e+06 |
| Am-241 | 2.89e+07 | 2.70e+07 | 2.07e+06 | 0.00e+00 | 1.56e+07 | 0.00e+00 | 2.84e+06 |
| Am-242m | 2.94e+07 | 2.56e+07 | 2.10e+06 | 0.00e+00 | 1.56e+07 | 0.00e+00 | 3.61e+06 |
| Am-243 | 2.91e+07 | 2.67e+07 | 2.05e+06 | 0.00e+00 | 1.54e+07 | 0.00e+00 | 3.36e+06 |
| Cm-242 | 7.27e+05 | 7.73e+05 | 4.83e+04 | 0.00e+00 | 2.19e+05 | 0.00e+00 | 2.79e+06 |
| Cm-243 | 2.31e+07 | 2.12e+07 | 1.45e+06 | 0.00e+00 | 6.75e+06 | 0.00e+00 | 3.01e+06 |
| Cm-244 | 1.76e+07 | 1.65e+07 | 1.11e+06 | 0.00e+00 | 5.17e+06 | 0.00e+00 | 2.91e+06 |
| Cm-245 | 3.62e+07 | 3.16e+07 | 2.23e+06 | 0.00e+00 | 1.04e+07 | 0.00e+00 | 2.72e+06 |
| Cm-246 | 3.59e+07 | 3.15e+07 | 2.22e+06 | 0.00e+00 | 1.04e+07 | 0.00e+00 | 2.67e+06 |
| Cm-247 | 3.50e+07 | 3.11e+07 | 2.19e+06 | 0.00e+00 | 1.02e+07 | 0.00e+00 | 3.51e+06 |
| Cm-248 | 2.91e+08 | 2.56e+08 | 1.80e+07 | 0.00e+00 | 8.42e+07 | 0.00e+00 | 5.68e+07 |
| Cf-252 | 9.92e+06 | 0.00e+00 | 2.39e+05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.09e+07 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# COW'S MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Cow's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| H-3 | 0.00e+00 | 5.66e+02 | 5.66e+02 | 5.66e+02 | 5.66e+02 | 5.66e+02 | 5.66e+02 |
| Be-10 | 4.47e+06 | 6.92e+05 | 1.13e+05 | 0.00e+00 | 5.29e+05 | 0.00e+00 | 2.83e+07 |
| C-14 | 4.86e+08 | 9.72e+07 | 9.72e+07 | 9.72e+07 | 9.72e+07 | 9.72e+07 | 9.72e+07 |
| N-13 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| F-18 | 8.30e-03 | 0.00e+00 | 9.10e-04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.48e-04 |
| Na-22 | 9.18e+09 | 9.18e+09 | 9.18e+09 | 9.18e+09 | 9.18e+09 | 9.18e+09 | 9.18e+09 |
| Na-24 | 4.27e+06 | 4.27e+06 | 4.27e+06 | 4.27e+06 | 4.27e+06 | 4.27e+06 | 4.27e+06 |
| P-32 | 3.15e+10 | 1.95e+09 | 1.22e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.65e+09 |
| Ca-41 | 1.57e+10 | 0.00e+00 | 1.70e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.56e+07 |
| Sc-46 | 3.04e+02 | 5.92e+02 | 1.76e+02 | 0.00e+00 | 5.67e+02 | 0.00e+00 | 2.02e+06 |
| Cr-51 | 0.00e+00 | 0.00e+00 | 4.99e+04 | 2.77e+04 | 1.09e+04 | 7.13e+04 | 8.39e+06 |
| Mn-54 | 0.00e+00 | 1.40e+07 | 2.78e+06 | 0.00e+00 | 4.18e+06 | 0.00e+00 | 2.87e+07 |
| Mn-56 | 0.00e+00 | 7.36e-03 | 1.31e-03 | 0.00e+00 | 9.32e-03 | 0.00e+00 | 4.85e-01 |
| Fe-55 | 4.45e+07 | 3.16e+07 | 7.36e+06 | 0.00e+00 | 0.00e+00 | 2.00e+07 | 1.37e+07 |
| Fe-59 | 5.18e+07 | 1.21e+08 | 4.67e+07 | 0.00e+00 | 0.00e+00 | 3.81e+07 | 2.86e+08 |
| Co-57 | 0.00e+00 | 2.24e+06 | 3.76e+06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.19e+07 |
| Co-58 | 0.00e+00 | 7.94e+06 | 1.83e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.09e+08 |
| Co-60 | 0.00e+00 | 2.78e+07 | 6.26e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.62e+08 |
| Ni-59 | 8.82e+08 | 3.11e+08 | 1.50e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.88e+07 |
| Ni-63 | 1.18e+10 | 8.35e+08 | 4.01e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.33e+08 |
| Ni-65 | 6.87e-01 | 8.78e-02 | 4.00e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.76e+00 |
| Cu-64 | 0.00e+00 | 4.26e+04 | 2.00e+04 | 0.00e+00 | 1.08e+05 | 0.00e+00 | 3.30e+06 |
| Zn-65 | 2.11e+09 | 7.32e+09 | 3.41e+09 | 0.00e+00 | 4.68e+09 | 0.00e+00 | 3.10e+09 |
| Zn-69 | 4.01e-12 | 7.65e-12 | 5.35e-13 | 0.00e+00 | 5.00e-12 | 0.00e+00 | 1.41e-11 |
| Zn-69m | 3.30e+05 | 7.79e+05 | 7.15e+04 | 0.00e+00 | 4.74e+05 | 0.00e+00 | 4.28e+07 |
| Se-79 | 0.00e+00 | 1.67e+09 | 2.81e+08 | 0.00e+00 | 2.92e+09 | 0.00e+00 | 2.56e+08 |
| Br-82 | 0.00e+00 | 0.00e+00 | 5.61e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-83 | 0.00e+00 | 0.00e+00 | 1.82e-01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-84 | 0.00e+00 | 0.00e+00 | 3.09e-23 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-85 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

Ri factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Cow's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Rb-86 | 0.00e+00 | 4.73e+09 | 2.22e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.00e+08 |
| Rb-87 | 0.00e+00 | 5.24e+09 | 1.83e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.83e+08 |
| Rb-88 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Rb-89 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sr-89 | 2.67e+09 | 0.00e+00 | 7.66e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.19e+08 |
| Sr-90 | 8.13e+10 | 0.00e+00 | 1.63e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.86e+09 |
| Sr-91 | 5.33e+04 | 0.00e+00 | 2.12e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.42e+05 |
| Sr-92 | 9.07e-01 | 0.00e+00 | 3.86e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.31e+01 |
| Y-90 | 1.30e+02 | 0.00e+00 | 3.51e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.07e+06 |
| Y-91 | 1.58e+04 | 0.00e+00 | 4.24e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.48e+06 |
| Y-91m | 1.15e-19 | 0.00e+00 | 4.39e-21 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.42e-18 |
| Y-92 | 1.04e-04 | 0.00e+00 | 3.01e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.86e+00 |
| Y-93 | 4.13e-01 | 0.00e+00 | 1.13e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.26e+04 |
| Zr-93 | 2.76e+03 | 1.36e+02 | 7.43e+01 | 0.00e+00 | 4.81e+02 | 0.00e+00 | 1.29e+05 |
| Zr-95 | 1.65e+03 | 5.20e+02 | 3.58e+02 | 0.00e+00 | 7.65e+02 | 0.00e+00 | 1.20e+06 |
| Zr-97 | 7.90e-01 | 1.56e-01 | 7.20e-02 | 0.00e+00 | 2.37e-01 | 0.00e+00 | 4.23e+04 |
| Nb-93m | 8.55e+05 | 2.81e+05 | 7.03e+04 | 0.00e+00 | 3.28e+05 | 0.00e+00 | 1.01e+08 |
| Nb-95 | 1.41e+05 | 7.81e+04 | 4.30e+04 | 0.00e+00 | 7.57e+04 | 0.00e+00 | 3.34e+08 |
| Nb-97 | 1.20e-11 | 2.98e-12 | 1.09e-12 | 0.00e+00 | 3.48e-12 | 0.00e+00 | 7.11e-08 |
| Mo-93 | 0.00e+00 | 7.93e+08 | 2.17e+07 | 0.00e+00 | 2.27e+08 | 0.00e+00 | 9.65e+07 |
| Mo-99 | 0.00e+00 | 4.47e+07 | 8.53e+06 | 0.00e+00 | 1.02e+08 | 0.00e+00 | 8.01e+07 |
| Tc-101 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Tc-99 | 4.46e+07 | 6.56e+07 | 1.79e+07 | 0.00e+00 | 8.33e+08 | 6.78e+06 | 1.61e+09 |
| Tc-99m | 5.80e+00 | 1.62e+01 | 2.10e+02 | 0.00e+00 | 2.41e+02 | 8.97e+00 | 1.06e+04 |
| Ru-103 | 1.81e+03 | 0.00e+00 | 7.74e+02 | 0.00e+00 | 6.38e+03 | 0.00e+00 | 1.51e+05 |
| Ru-105 | 1.58e-03 | 0.00e+00 | 6.13e-04 | 0.00e+00 | 1.99e-02 | 0.00e+00 | 1.27e+00 |
| Ru-106 | 3.75e+04 | 0.00e+00 | 4.73e+03 | 0.00e+00 | 7.24e+04 | 0.00e+00 | 1.80e+06 |
| Rh-105 | 6.38e+05 | 4.61e+05 | 3.03e+05 | 0.00e+00 | 1.96e+06 | 0.00e+00 | 5.87e+07 |
| Pd-107 | 0.00e+00 | 2.07e+07 | 1.34e+06 | 0.00e+00 | 1.87e+08 | 0.00e+00 | 9.63e+07 |
| Pd-109 | 0.00e+00 | 8.22e+04 | 1.87e+04 | 0.00e+00 | 4.75e+05 | 0.00e+00 | 8.29e+06 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

Ri factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Cow's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ag-110m | 9.63e+07 | 9.11e+07 | 5.54e+07 | 0.00e+00 | 1.74e+08 | 0.00e+00 | 2.56e+10 |
| Ag-111 | 1.19e+07 | 4.95e+06 | 2.49e+06 | 0.00e+00 | 1.61e+07 | 0.00e+00 | 6.90e+09 |
| Cd-113m | 0.00e+00 | 5.38e+06 | 1.73e+05 | 0.00e+00 | 5.95e+06 | 0.00e+00 | 3.23e+07 |
| Cd-115m | 0.00e+00 | 2.30e+06 | 7.41e+04 | 0.00e+00 | 1.84e+06 | 0.00e+00 | 7.27e+07 |
| Sn-123 | 9.88e+08 | 1.62e+07 | 2.40e+07 | 1.30e+07 | 0.00e+00 | 0.00e+00 | 1.49e+09 |
| Sn-125 | 1.05e+08 | 2.08e+06 | 4.72e+06 | 1.64e+06 | 0.00e+00 | 0.00e+00 | 9.85e+08 |
| Sn-126 | 2.89e+09 | 5.38e+07 | 8.23e+07 | 1.42e+07 | 0.00e+00 | 0.00e+00 | 6.43e+08 |
| Sb-124 | 4.59e+07 | 8.46e+05 | 1.79e+07 | 1.04e+05 | 0.00e+00 | 4.01e+07 | 9.25e+08 |
| Sb-125 | 3.65e+07 | 3.99e+05 | 8.55e+06 | 3.49e+04 | 0.00e+00 | 3.21e+07 | 2.84e+08 |
| Sb-126 | 1.00e+07 | 2.05e+05 | 3.61e+06 | 5.68e+04 | 0.00e+00 | 7.20e+06 | 5.94e+08 |
| Sb-127 | 8.23e+05 | 1.76e+04 | 3.11e+05 | 9.25e+03 | 0.00e+00 | 5.60e+05 | 1.40e+08 |
| Te-125m | 3.00e+07 | 1.08e+07 | 4.02e+06 | 8.39e+06 | 0.00e+00 | 0.00e+00 | 8.86e+07 |
| Te-127 | 1.22e+03 | 4.31e+02 | 2.61e+02 | 8.38e+02 | 4.92e+03 | 0.00e+00 | 9.38e+04 |
| Te-127m | 8.44e+07 | 2.99e+07 | 1.00e+07 | 2.01e+07 | 3.42e+08 | 0.00e+00 | 2.10e+08 |
| Te-129 | 5.37e-10 | 2.00e-10 | 1.31e-10 | 3.84e-10 | 2.25e-09 | 0.00e+00 | 2.94e-09 |
| Te-129m | 1.10e+08 | 4.09e+07 | 1.74e+07 | 3.55e+07 | 4.61e+08 | 0.00e+00 | 4.13e+08 |
| Te-131 | 7.22e-33 | 2.98e-33 | 2.26e-33 | 5.57e-33 | 3.16e-32 | 0.00e+00 | 5.93e-34 |
| Te-131m | 6.58e+05 | 3.15e+05 | 2.63e+05 | 4.75e+05 | 3.29e+06 | 0.00e+00 | 2.53e+07 |
| Te-132 | 4.29e+06 | 2.72e+06 | 2.56e+06 | 2.87e+06 | 2.61e+07 | 0.00e+00 | 8.61e+07 |
| Te-133m | 3.95e-13 | 2.24e-13 | 2.18e-13 | 3.13e-13 | 2.22e-12 | 0.00e+00 | 9.07e-13 |
| Te-134 | 1.68e-18 | 1.08e-18 | 1.12e-18 | 1.38e-18 | 1.03e-17 | 0.00e+00 | 6.22e-20 |
| I-129 | 1.39e+09 | 1.17e+09 | 1.96e+09 | 1.43e+12 | 2.10e+09 | 0.00e+00 | 1.37e+08 |
| I-130 | 7.41e+05 | 2.14e+06 | 8.56e+05 | 1.75e+08 | 3.30e+06 | 0.00e+00 | 1.65e+06 |
| I-131 | 5.37e+08 | 7.52e+08 | 4.04e+08 | 2.20e+11 | 1.30e+09 | 0.00e+00 | 1.49e+08 |
| I-132 | 2.96e-01 | 7.75e-01 | 2.78e-01 | 2.61e+01 | 1.22e+00 | 0.00e+00 | 3.38e-01 |
| I-133 | 7.08e+06 | 1.20e+07 | 3.66e+06 | 1.68e+09 | 2.11e+07 | 0.00e+00 | 9.09e+06 |
| I-134 | 3.74e-12 | 9.92e-12 | 3.56e-12 | 1.65e-10 | 1.56e-11 | 0.00e+00 | 1.31e-13 |
| I-135 | 2.29e+04 | 5.90e+04 | 2.19e+04 | 3.80e+06 | 9.33e+04 | 0.00e+00 | 6.54e+04 |
| Cs-134 | 9.81e+09 | 2.31e+10 | 1.07e+10 | 0.00e+00 | 7.34e+09 | 2.80e+09 | 2.87e+08 |
| Cs-134m | 3.13e-01 | 6.49e-01 | 3.34e-01 | 0.00e+00 | 3.61e-01 | 6.34e-02 | 4.32e-01 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

Ri factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Cow's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Cs-135 | 3.33e+09 | 3.05e+09 | 7.13e+08 | 0.00e+00 | 1.16e+09 | 4.21e+08 | 5.34e+07 |
| Cs-136 | 4.48e+08 | 1.76e+09 | 1.18e+09 | 0.00e+00 | 9.60e+08 | 1.51e+08 | 1.42e+08 |
| Cs-137 | 1.34e+10 | 1.78e+10 | 6.20e+09 | 0.00e+00 | 6.06e+09 | 2.35e+09 | 2.53e+08 |
| Cs-138 | 1.76e-23 | 3.38e-23 | 1.69e-23 | 0.00e+00 | 2.50e-23 | 2.91e-24 | 1.54e-26 |
| Cs-139 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-139 | 8.40e-08 | 5.91e-11 | 2.45e-09 | 0.00e+00 | 5.57e-11 | 4.07e-11 | 7.50e-07 |
| Ba-140 | 4.85e+07 | 5.95e+04 | 3.13e+06 | 0.00e+00 | 2.02e+04 | 4.00e+04 | 7.48e+07 |
| Ba-141 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-142 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| La-140 | 8.11e+00 | 3.99e+00 | 1.06e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.29e+05 |
| La-141 | 5.52e-05 | 1.70e-05 | 2.80e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.01e+00 |
| La-142 | 3.43e-11 | 1.53e-11 | 3.80e-12 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.64e-07 |
| Ce-141 | 8.88e+03 | 5.93e+03 | 6.81e+02 | 0.00e+00 | 2.79e+03 | 0.00e+00 | 1.70e+07 |
| Ce-143 | 7.65e+01 | 5.56e+04 | 6.21e+00 | 0.00e+00 | 2.50e+01 | 0.00e+00 | 1.67e+06 |
| Ce-144 | 6.58e+05 | 2.72e+05 | 3.54e+04 | 0.00e+00 | 1.63e+05 | 0.00e+00 | 1.66e+08 |
| Pr-143 | 2.90e+02 | 1.16e+02 | 1.44e+01 | 0.00e+00 | 6.73e+01 | 0.00e+00 | 9.55e+05 |
| Pr-144 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Nd-147 | 1.81e+02 | 1.97e+02 | 1.18e+01 | 0.00e+00 | 1.16e+02 | 0.00e+00 | 7.11e+05 |
| Pm-147 | 5.15e+03 | 4.89e+02 | 1.99e+02 | 0.00e+00 | 9.32e+02 | 0.00e+00 | 4.65e+05 |
| Pm-148 | 1.09e+02 | 1.77e+01 | 8.93e+00 | 0.00e+00 | 3.20e+01 | 0.00e+00 | 1.06e+06 |
| Pm-148m | 1.49e+03 | 3.78e+02 | 2.96e+02 | 0.00e+00 | 5.73e+02 | 0.00e+00 | 2.38e+06 |
| Pm-149 | 7.88e+00 | 1.11e+00 | 4.54e-01 | 0.00e+00 | 2.11e+00 | 0.00e+00 | 1.63e+05 |
| Pm-151 | 1.18e+00 | 1.95e-01 | 9.88e-02 | 0.00e+00 | 3.51e-01 | 0.00e+00 | 4.38e+04 |
| Sm-151 | 4.35e+03 | 8.37e+02 | 1.96e+02 | 0.00e+00 | 9.17e+02 | 0.00e+00 | 2.84e+05 |
| Sm-153 | 3.65e+00 | 3.02e+00 | 2.22e-01 | 0.00e+00 | 9.88e-01 | 0.00e+00 | 8.53e+04 |
| Eu-152 | 1.22e+04 | 2.93e+03 | 2.58e+03 | 0.00e+00 | 1.36e+04 | 0.00e+00 | 1.08e+06 |
| Eu-154 | 3.94e+04 | 5.08e+03 | 3.58e+03 | 0.00e+00 | 2.27e+04 | 0.00e+00 | 2.69e+06 |
| Eu-155 | 8.48e+03 | 8.18e+02 | 5.07e+02 | 0.00e+00 | 3.20e+03 | 0.00e+00 | 4.69e+06 |
| Eu-156 | 4.55e+02 | 3.41e+02 | 5.57e+01 | 0.00e+00 | 2.30e+02 | 0.00e+00 | 1.74e+06 |
| Tb-160 | 2.65e+03 | 0.00e+00 | 3.31e+02 | 0.00e+00 | 1.05e+03 | 0.00e+00 | 1.72e+06 |

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Ri factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Cow's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ho-166m | 1.78e+04 | 5.48e+03 | 3.97e+03 | 0.00e+00 | 8.03e+03 | 0.00e+00 | 1.35e+06 |
| W-181 | 6.27e+04 | 2.02e+04 | 2.12e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.72e+06 |
| W-185 | 2.39e+06 | 7.88e+05 | 8.33e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.81e+07 |
| W-187 | 1.19e+04 | 9.73e+03 | 3.41e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.63e+06 |
| Pb-210 | 1.12e+11 | 3.36e+10 | 4.33e+09 | 0.00e+00 | 1.06e+11 | 0.00e+00 | 1.46e+07 |
| Bi-210 | 6.57e+05 | 4.49e+06 | 3.76e+05 | 0.00e+00 | 5.46e+07 | 0.00e+00 | 5.13e+07 |
| Po-210 | 1.37e+09 | 2.88e+09 | 3.31e+08 | 0.00e+00 | 9.68e+09 | 0.00e+00 | 1.81e+08 |
| Ra-223 | 2.25e+11 | 3.42e+08 | 4.50e+10 | 0.00e+00 | 9.83e+09 | 0.00e+00 | 1.09e+10 |
| Ra-224 | 2.62e+10 | 6.25e+07 | 5.22e+09 | 0.00e+00 | 1.79e+09 | 0.00e+00 | 4.20e+09 |
| Ra-225 | 3.50e+11 | 4.11e+08 | 6.98e+10 | 0.00e+00 | 1.18e+10 | 0.00e+00 | 1.22e+10 |
| Ra-226 | 2.57e+13 | 6.49e+08 | 1.91e+13 | 0.00e+00 | 1.85e+10 | 0.00e+00 | 2.80e+10 |
| Ra-228 | 1.08e+13 | 3.49e+08 | 1.20e+13 | 0.00e+00 | 9.98e+09 | 0.00e+00 | 4.74e+09 |
| Ac-225 | 1.14e+05 | 1.55e+05 | 7.63e+03 | 0.00e+00 | 1.78e+04 | 0.00e+00 | 7.89e+06 |
| Ac-227 | 1.02e+08 | 1.51e+07 | 6.07e+06 | 0.00e+00 | 4.38e+06 | 0.00e+00 | 4.32e+06 |
| Th-227 | 5.16e+05 | 9.27e+03 | 1.49e+04 | 0.00e+00 | 5.29e+04 | 0.00e+00 | 1.51e+07 |
| Th-228 | 3.32e+07 | 5.56e+05 | 1.12e+06 | 0.00e+00 | 3.13e+06 | 0.00e+00 | 2.91e+07 |
| Th-229 | 7.13e+08 | 2.05e+07 | 1.18e+07 | 0.00e+00 | 9.92e+07 | 0.00e+00 | 4.13e+06 |
| Th-230 | 1.08e+08 | 6.13e+06 | 2.99e+06 | 0.00e+00 | 2.99e+07 | 0.00e+00 | 3.18e+06 |
| Th-232 | 1.21e+08 | 5.24e+06 | 8.13e+04 | 0.00e+00 | 2.55e+07 | 0.00e+00 | 2.71e+06 |
| Th-234 | 3.39e+03 | 1.99e+02 | 9.86e+01 | 0.00e+00 | 1.13e+03 | 0.00e+00 | 3.60e+06 |
| Pa-231 | 2.15e+08 | 8.08e+06 | 8.38e+06 | 0.00e+00 | 4.54e+07 | 0.00e+00 | 3.79e+06 |
| Pa-233 | 2.30e+02 | 4.42e+01 | 3.95e+01 | 0.00e+00 | 1.67e+02 | 0.00e+00 | 5.05e+05 |
| U-232 | 2.94e+10 | 0.00e+00 | 2.10e+09 | 0.00e+00 | 3.18e+09 | 0.00e+00 | 3.58e+08 |
| U-233 | 6.18e+09 | 0.00e+00 | 3.76e+08 | 0.00e+00 | 1.45e+09 | 0.00e+00 | 3.32e+08 |
| U-234 | 5.93e+09 | 0.00e+00 | 3.68e+08 | 0.00e+00 | 1.42e+09 | 0.00e+00 | 3.25e+08 |
| U-235 | 5.68e+09 | 0.00e+00 | 3.46e+08 | 0.00e+00 | 1.33e+09 | 0.00e+00 | 4.13e+08 |
| U-236 | 5.68e+09 | 0.00e+00 | 3.54e+08 | 0.00e+00 | 1.36e+09 | 0.00e+00 | 3.05e+08 |
| U-237 | 1.04e+05 | 0.00e+00 | 2.77e+04 | 0.00e+00 | 4.28e+05 | 0.00e+00 | 2.76e+07 |
| U-238 | 5.43e+09 | 0.00e+00 | 3.24e+08 | 0.00e+00 | 1.25e+09 | 0.00e+00 | 2.91e+08 |
| Np-237 | 6.63e+07 | 4.76e+06 | 2.92e+06 | 0.00e+00 | 2.16e+07 | 0.00e+00 | 4.19e+06 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

Ri factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Cow's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Np-238 | 6.65e+01 | 1.78e+00 | 1.04e+00 | 0.00e+00 | 6.10e+00 | 0.00e+00 | 1.31e+05 |
| Np-239 | 7.01e+00 | 6.62e-01 | 3.67e-01 | 0.00e+00 | 2.08e+00 | 0.00e+00 | 1.06e+05 |
| Pu-238 | 1.34e+07 | 1.71e+06 | 3.63e+05 | 0.00e+00 | 1.55e+06 | 0.00e+00 | 1.54e+06 |
| Pu-239 | 1.53e+07 | 1.85e+06 | 4.01e+05 | 0.00e+00 | 1.71e+06 | 0.00e+00 | 1.41e+06 |
| Pu-240 | 1.52e+07 | 1.85e+06 | 4.01e+05 | 0.00e+00 | 1.71e+06 | 0.00e+00 | 1.43e+06 |
| Pu-241 | 3.48e+05 | 1.67e+04 | 7.34e+03 | 0.00e+00 | 3.40e+04 | 0.00e+00 | 2.94e+04 |
| Pu-242 | 1.41e+07 | 1.78e+06 | 3.87e+05 | 0.00e+00 | 1.65e+06 | 0.00e+00 | 1.38e+06 |
| Pu-244 | 1.65e+07 | 2.03e+06 | 4.43e+05 | 0.00e+00 | 1.88e+06 | 0.00e+00 | 2.05e+06 |
| Am-241 | 3.94e+07 | 3.72e+07 | 2.84e+06 | 0.00e+00 | 2.13e+07 | 0.00e+00 | 3.89e+06 |
| Am-242m | 4.02e+07 | 3.54e+07 | 2.89e+06 | 0.00e+00 | 2.14e+07 | 0.00e+00 | 4.93e+06 |
| Am-243 | 3.97e+07 | 3.66e+07 | 2.80e+06 | 0.00e+00 | 2.10e+07 | 0.00e+00 | 4.60e+06 |
| Cm-242 | 1.34e+06 | 1.41e+06 | 8.88e+04 | 0.00e+00 | 4.05e+05 | 0.00e+00 | 3.82e+06 |
| Cm-243 | 3.24e+07 | 3.00e+07 | 2.04e+06 | 0.00e+00 | 9.51e+06 | 0.00e+00 | 4.12e+06 |
| Cm-244 | 2.51e+07 | 2.37e+07 | 1.59e+06 | 0.00e+00 | 7.41e+06 | 0.00e+00 | 3.98e+06 |
| Cm-245 | 4.94e+07 | 4.34e+07 | 3.04e+06 | 0.00e+00 | 1.42e+07 | 0.00e+00 | 3.72e+06 |
| Cm-246 | 4.90e+07 | 4.34e+07 | 3.04e+06 | 0.00e+00 | 1.42e+07 | 0.00e+00 | 3.65e+06 |
| Cm-247 | 4.77e+07 | 4.27e+07 | 2.99e+06 | 0.00e+00 | 1.40e+07 | 0.00e+00 | 4.80e+06 |
| Cm-248 | 3.96e+08 | 3.52e+08 | 2.47e+07 | 0.00e+00 | 1.15e+08 | 0.00e+00 | 7.73e+07 |
| Cf-252 | 1.70e+07 | 0.00e+00 | 4.10e+05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.50e+07 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# COW'S MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Cow's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| H-3 | 0.00e+00 | 8.97e+02 | 8.97e+02 | 8.97e+02 | 8.97e+02 | 8.97e+02 | 8.97e+02 |
| Be-10 | 1.11e+07 | 1.29e+06 | 2.79e+05 | 0.00e+00 | 9.13e+05 | 0.00e+00 | 2.26e+07 |
| C-14 | 1.19e+09 | 2.39e+08 | 2.39e+08 | 2.39e+08 | 2.39e+08 | 2.39e+08 | 2.39e+08 |
| N-13 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| F-18 | 1.97e-02 | 0.00e+00 | 1.96e-03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.34e-03 |
| Na-22 | 1.90e+10 | 1.90e+10 | 1.90e+10 | 1.90e+10 | 1.90e+10 | 1.90e+10 | 1.90e+10 |
| Na-24 | 8.88e+06 | 8.88e+06 | 8.88e+06 | 8.88e+06 | 8.88e+06 | 8.88e+06 | 8.88e+06 |
| P-32 | 7.78e+10 | 3.64e+09 | 3.00e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.15e+09 |
| Ca-41 | 2.28e+10 | 0.00e+00 | 2.49e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.25e+07 |
| Sc-46 | 6.83e+02 | 9.36e+02 | 3.61e+02 | 0.00e+00 | 8.29e+02 | 0.00e+00 | 1.37e+06 |
| Cr-51 | 0.00e+00 | 0.00e+00 | 1.02e+05 | 5.65e+04 | 1.54e+04 | 1.03e+05 | 5.40e+06 |
| Mn-54 | 0.00e+00 | 2.10e+07 | 5.59e+06 | 0.00e+00 | 5.88e+06 | 0.00e+00 | 1.76e+07 |
| Mn-56 | 0.00e+00 | 1.28e-02 | 2.90e-03 | 0.00e+00 | 1.55e-02 | 0.00e+00 | 1.86e+00 |
| Fe-55 | 1.12e+08 | 5.93e+07 | 1.84e+07 | 0.00e+00 | 0.00e+00 | 3.35e+07 | 1.10e+07 |
| Fe-59 | 1.20e+08 | 1.95e+08 | 9.69e+07 | 0.00e+00 | 0.00e+00 | 5.64e+07 | 2.03e+08 |
| Co-57 | 0.00e+00 | 3.84e+06 | 7.77e+06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.14e+07 |
| Co-58 | 0.00e+00 | 1.21e+07 | 3.71e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.07e+07 |
| Co-60 | 0.00e+00 | 4.32e+07 | 1.27e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.39e+08 |
| Ni-59 | 2.22e+09 | 5.90e+08 | 3.76e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.91e+07 |
| Ni-63 | 2.96e+10 | 1.59e+09 | 1.01e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.07e+08 |
| Ni-65 | 1.68e+00 | 1.58e-01 | 9.24e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.94e+01 |
| Cu-64 | 0.00e+00 | 7.49e+04 | 4.52e+04 | 0.00e+00 | 1.81e+05 | 0.00e+00 | 3.51e+06 |
| Zn-65 | 4.13e+09 | 1.10e+10 | 6.85e+09 | 0.00e+00 | 6.94e+09 | 0.00e+00 | 1.93e+09 |
| Zn-69 | 9.87e-12 | 1.43e-11 | 1.32e-12 | 0.00e+00 | 8.65e-12 | 0.00e+00 | 8.99e-10 |
| Zn-69m | 8.06e+05 | 1.37e+06 | 1.62e+05 | 0.00e+00 | 7.98e+05 | 0.00e+00 | 4.47e+07 |
| Se-79 | 0.00e+00 | 3.12e+09 | 6.92e+08 | 0.00e+00 | 5.07e+09 | 0.00e+00 | 2.05e+08 |
| Br-82 | 0.00e+00 | 0.00e+00 | 1.15e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-83 | 0.00e+00 | 0.00e+00 | 4.47e-01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-84 | 0.00e+00 | 0.00e+00 | 7.00e-23 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-85 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

Ri factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Cow's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Rb-86 | 0.00e+00 | 8.77e+09 | 5.39e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.64e+08 |
| Rb-87 | 0.00e+00 | 9.75e+09 | 4.52e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.46e+08 |
| Rb-88 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Rb-89 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sr-89 | 6.62e+09 | 0.00e+00 | 1.89e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.56e+08 |
| Sr-90 | 1.68e+11 | 0.00e+00 | 3.38e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.50e+09 |
| Sr-91 | 1.31e+05 | 0.00e+00 | 4.94e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.89e+05 |
| Sr-92 | 2.21e+00 | 0.00e+00 | 8.88e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.19e+01 |
| Y-90 | 3.22e+02 | 0.00e+00 | 8.63e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 9.18e+05 |
| Y-91 | 3.90e+04 | 0.00e+00 | 1.04e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.20e+06 |
| Y-91m | 2.80e-19 | 0.00e+00 | 1.02e-20 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.49e-16 |
| Y-92 | 2.56e-04 | 0.00e+00 | 7.32e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.39e+00 |
| Y-93 | 1.02e+00 | 0.00e+00 | 2.79e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.51e+04 |
| Zr-93 | 6.87e+03 | 2.57e+02 | 1.83e+02 | 0.00e+00 | 9.95e+02 | 0.00e+00 | 9.75e+04 |
| Zr-95 | 3.83e+03 | 8.42e+02 | 7.50e+02 | 0.00e+00 | 1.21e+03 | 0.00e+00 | 8.79e+05 |
| Zr-97 | 1.92e+00 | 2.78e-01 | 1.64e-01 | 0.00e+00 | 3.99e-01 | 0.00e+00 | 4.21e+04 |
| Nb-93m | 2.15e+06 | 5.37e+05 | 1.77e+05 | 0.00e+00 | 5.80e+05 | 0.00e+00 | 8.10e+07 |
| Nb-95 | 3.18e+05 | 1.24e+05 | 8.84e+04 | 0.00e+00 | 1.16e+05 | 0.00e+00 | 2.29e+08 |
| Nb-97 | 2.91e-11 | 5.26e-12 | 2.46e-12 | 0.00e+00 | 5.84e-12 | 0.00e+00 | 1.62e-06 |
| Mo-93 | 0.00e+00 | 1.49e+09 | 5.34e+07 | 0.00e+00 | 3.92e+08 | 0.00e+00 | 7.53e+07 |
| Mo-99 | 0.00e+00 | 8.14e+07 | 2.01e+07 | 0.00e+00 | 1.74e+08 | 0.00e+00 | 6.73e+07 |
| Tc-101 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Tc-99 | 1.10e+08 | 1.23e+08 | 4.40e+07 | 0.00e+00 | 1.44e+09 | 1.08e+07 | 1.29e+09 |
| Tc-99m | 1.33e+01 | 2.61e+01 | 4.32e+02 | 0.00e+00 | 3.79e+02 | 1.32e+01 | 1.48e+04 |
| Ru-103 | 4.28e+03 | 0.00e+00 | 1.65e+03 | 0.00e+00 | 1.08e+04 | 0.00e+00 | 1.11e+05 |
| Ru-105 | 3.85e-03 | 0.00e+00 | 1.40e-03 | 0.00e+00 | 3.39e-02 | 0.00e+00 | 2.51e+00 |
| Ru-106 | 9.24e+04 | 0.00e+00 | 1.15e+04 | 0.00e+00 | 1.25e+05 | 0.00e+00 | 1.44e+06 |
| Rh-105 | 1.56e+06 | 8.40e+05 | 7.18e+05 | 0.00e+00 | 3.35e+06 | 0.00e+00 | 5.21e+07 |
| Pd-107 | 0.00e+00 | 3.88e+07 | 3.30e+06 | 0.00e+00 | 3.25e+08 | 0.00e+00 | 7.71e+07 |
| Pd-109 | 0.00e+00 | 1.53e+05 | 4.59e+04 | 0.00e+00 | 8.22e+05 | 0.00e+00 | 9.05e+06 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

Ri factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Cow's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ag-110m | 2.09e+08 | 1.41e+08 | 1.13e+08 | 0.00e+00 | 2.63e+08 | 0.00e+00 | 1.68e+10 |
| Ag-111 | 2.94e+07 | 9.20e+06 | 6.07e+06 | 0.00e+00 | 2.78e+07 | 0.00e+00 | 5.63e+09 |
| Cd-113m | 0.00e+00 | 1.00e+07 | 4.27e+05 | 0.00e+00 | 1.03e+07 | 0.00e+00 | 2.59e+07 |
| Cd-115m | 0.00e+00 | 4.29e+06 | 1.83e+05 | 0.00e+00 | 3.19e+06 | 0.00e+00 | 5.83e+07 |
| Sn-123 | 2.44e+09 | 3.03e+07 | 5.95e+07 | 3.21e+07 | 0.00e+00 | 0.00e+00 | 1.20e+09 |
| Sn-125 | 2.57e+08 | 3.88e+06 | 1.15e+07 | 4.03e+06 | 0.00e+00 | 0.00e+00 | 7.98e+08 |
| Sn-126 | 6.85e+09 | 8.54e+07 | 1.95e+08 | 2.34e+07 | 0.00e+00 | 0.00e+00 | 5.14e+08 |
| Sb-124 | 1.09e+08 | 1.41e+06 | 3.81e+07 | 2.40e+05 | 0.00e+00 | 6.03e+07 | 6.79e+08 |
| Sb-125 | 8.70e+07 | 6.71e+05 | 1.82e+07 | 8.06e+04 | 0.00e+00 | 4.85e+07 | 2.08e+08 |
| Sb-126 | 2.29e+07 | 3.51e+05 | 8.23e+06 | 1.34e+05 | 0.00e+00 | 1.09e+07 | 4.62e+08 |
| Sb-127 | 1.98e+06 | 3.07e+04 | 6.88e+05 | 2.21e+04 | 0.00e+00 | 8.60e+05 | 1.12e+08 |
| Te-125m | 7.38e+07 | 2.00e+07 | 9.84e+06 | 2.07e+07 | 0.00e+00 | 0.00e+00 | 7.12e+07 |
| Te-127 | 2.99e+03 | 8.06e+02 | 6.41e+02 | 2.07e+03 | 8.50e+03 | 0.00e+00 | 1.17e+05 |
| Te-127m | 2.08e+08 | 5.60e+07 | 2.47e+07 | 4.97e+07 | 5.93e+08 | 0.00e+00 | 1.68e+08 |
| Te-129 | 1.33e-09 | 3.70e-10 | 3.15e-10 | 9.46e-10 | 3.88e-09 | 0.00e+00 | 8.25e-08 |
| Te-129m | 2.71e+08 | 7.58e+07 | 4.21e+07 | 8.75e+07 | 7.97e+08 | 0.00e+00 | 3.31e+08 |
| Te-131 | 1.77e-32 | 5.40e-33 | 5.27e-33 | 1.36e-32 | 5.36e-32 | 0.00e+00 | 9.31e-32 |
| Te-131m | 1.60e+06 | 5.54e+05 | 5.89e+05 | 1.14e+06 | 5.36e+06 | 0.00e+00 | 2.25e+07 |
| Te-132 | 1.03e+07 | 4.54e+06 | 5.48e+06 | 6.61e+06 | 4.21e+07 | 0.00e+00 | 4.57e+07 |
| Te-133m | 9.46e-13 | 3.82e-13 | 4.74e-13 | 7.33e-13 | 3.63e-12 | 0.00e+00 | 2.92e-11 |
| Te-134 | 3.99e-18 | 1.79e-18 | 2.39e-18 | 3.15e-18 | 1.66e-17 | 0.00e+00 | 1.82e-17 |
| I-129 | 3.43e+09 | 2.11e+09 | 1.88e+09 | 1.38e+12 | 3.55e+09 | 0.00e+00 | 1.06e+08 |
| I-130 | 1.73e+06 | 3.50e+06 | 1.80e+06 | 3.86e+08 | 5.23e+06 | 0.00e+00 | 1.64e+06 |
| I-131 | 1.30e+09 | 1.31e+09 | 7.45e+08 | 4.33e+11 | 2.15e+09 | 0.00e+00 | 1.17e+08 |
| I-132 | 7.01e-01 | 1.29e+00 | 5.92e-01 | 5.97e+01 | 1.97e+00 | 0.00e+00 | 1.52e+00 |
| I-133 | 1.72e+07 | 2.13e+07 | 8.05e+06 | 3.95e+09 | 3.55e+07 | 0.00e+00 | 8.57e+06 |
| I-134 | 8.87e-12 | 1.65e-11 | 7.57e-12 | 3.79e-10 | 2.52e-11 | 0.00e+00 | 1.09e-11 |
| I-135 | 5.43e+04 | 9.77e+04 | 4.62e+04 | 8.66e+06 | 1.50e+05 | 0.00e+00 | 7.45e+04 |
| Cs-134 | 2.26e+10 | 3.71e+10 | 7.84e+09 | 0.00e+00 | 1.15e+10 | 4.13e+09 | 2.00e+08 |
| Cs-134m | 7.42e-01 | 1.10e+00 | 7.18e-01 | 0.00e+00 | 5.80e-01 | 9.59e-02 | 1.39e+00 |

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Ri factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Cow's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Cs-135 | 8.19e+09 | 5.71e+09 | 5.85e+08 | 0.00e+00 | 2.01e+09 | 6.72e+08 | 4.27e+07 |
| Cs-136 | 1.01e+09 | 2.78e+09 | 1.80e+09 | 0.00e+00 | 1.48e+09 | 2.21e+08 | 9.77e+07 |
| Cs-137 | 3.22e+10 | 3.09e+10 | 4.55e+09 | 0.00e+00 | 1.01e+10 | 3.62e+09 | 1.93e+08 |
| Cs-138 | 4.27e-23 | 5.94e-23 | 3.77e-23 | 0.00e+00 | 4.18e-23 | 4.50e-24 | 2.74e-23 |
| Cs-139 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-139 | 2.06e-07 | 1.10e-10 | 5.98e-09 | 0.00e+00 | 9.62e-11 | 6.48e-11 | 1.19e-05 |
| Ba-140 | 1.17e+08 | 1.03e+05 | 6.84e+06 | 0.00e+00 | 3.34e+04 | 6.12e+04 | 5.93e+07 |
| Ba-141 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-142 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| La-140 | 1.94e+01 | 6.79e+00 | 2.29e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.89e+05 |
| La-141 | 1.36e-04 | 3.17e-05 | 6.89e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.06e+00 |
| La-142 | 8.30e-11 | 2.64e-11 | 8.28e-12 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.24e-06 |
| Ce-141 | 2.19e+04 | 1.09e+04 | 1.62e+03 | 0.00e+00 | 4.78e+03 | 0.00e+00 | 1.36e+07 |
| Ce-143 | 1.88e+02 | 1.02e+05 | 1.47e+01 | 0.00e+00 | 4.27e+01 | 0.00e+00 | 1.49e+06 |
| Ce-144 | 1.62e+06 | 5.09e+05 | 8.66e+04 | 0.00e+00 | 2.82e+05 | 0.00e+00 | 1.33e+08 |
| Pr-143 | 7.18e+02 | 2.16e+02 | 3.56e+01 | 0.00e+00 | 1.17e+02 | 0.00e+00 | 7.75e+05 |
| Pr-144 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Nd-147 | 4.45e+02 | 3.60e+02 | 2.79e+01 | 0.00e+00 | 1.98e+02 | 0.00e+00 | 5.71e+05 |
| Pm-147 | 1.29e+04 | 9.19e+02 | 4.94e+02 | 0.00e+00 | 1.62e+03 | 0.00e+00 | 3.72e+05 |
| Pm-148 | 2.66e+02 | 3.20e+01 | 2.07e+01 | 0.00e+00 | 5.44e+01 | 0.00e+00 | 8.54e+05 |
| Pm-148m | 3.06e+03 | 6.09e+02 | 6.09e+02 | 0.00e+00 | 9.03e+02 | 0.00e+00 | 1.72e+06 |
| Pm-149 | 1.94e+01 | 2.07e+00 | 1.12e+00 | 0.00e+00 | 3.65e+00 | 0.00e+00 | 1.41e+05 |
| Pm-151 | 2.88e+00 | 3.51e-01 | 2.28e-01 | 0.00e+00 | 5.95e-01 | 0.00e+00 | 3.98e+04 |
| Sm-151 | 1.05e+04 | 1.57e+03 | 4.93e+02 | 0.00e+00 | 1.62e+03 | 0.00e+00 | 2.27e+05 |
| Sm-153 | 9.02e+00 | 5.61e+00 | 5.41e-01 | 0.00e+00 | 1.71e+00 | 0.00e+00 | 7.46e+04 |
| Eu-152 | 2.52e+04 | 4.59e+03 | 5.45e+03 | 0.00e+00 | 1.94e+04 | 0.00e+00 | 7.54e+05 |
| Eu-154 | 9.46e+04 | 8.51e+03 | 7.77e+03 | 0.00e+00 | 3.74e+04 | 0.00e+00 | 1.98e+06 |
| Eu-155 | 1.94e+04 | 1.39e+03 | 1.09e+03 | 0.00e+00 | 5.22e+03 | 0.00e+00 | 3.49e+06 |
| Eu-156 | 1.10e+03 | 5.88e+02 | 1.22e+02 | 0.00e+00 | 3.79e+02 | 0.00e+00 | 1.33e+06 |
| Tb-160 | 5.61e+03 | 0.00e+00 | 6.96e+02 | 0.00e+00 | 1.67e+03 | 0.00e+00 | 1.24e+06 |

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Ri factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Cow's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ho-166m | 4.44e+04 | 9.30e+03 | 7.86e+03 | 0.00e+00 | 1.32e+04 | 0.00e+00 | 1.08e+06 |
| W-181 | 1.54e+05 | 3.79e+04 | 5.21e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.38e+06 |
| W-185 | 5.89e+06 | 1.47e+06 | 2.06e+05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.48e+07 |
| W-187 | 2.89e+04 | 1.71e+04 | 7.69e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.41e+06 |
| Pb-210 | 2.42e+11 | 6.21e+10 | 1.06e+10 | 0.00e+00 | 1.87e+11 | 0.00e+00 | 1.17e+07 |
| Bi-210 | 1.62e+06 | 8.38e+06 | 9.29e+05 | 0.00e+00 | 9.45e+07 | 0.00e+00 | 4.25e+07 |
| Po-210 | 3.37e+09 | 5.39e+09 | 8.14e+08 | 0.00e+00 | 1.68e+10 | 0.00e+00 | 1.45e+08 |
| Ra-223 | 5.55e+11 | 6.41e+08 | 1.11e+11 | 0.00e+00 | 1.70e+10 | 0.00e+00 | 8.84e+09 |
| Ra-224 | 6.43e+10 | 1.17e+08 | 1.29e+10 | 0.00e+00 | 3.09e+09 | 0.00e+00 | 3.53e+09 |
| Ra-225 | 8.62e+11 | 7.70e+08 | 1.72e+11 | 0.00e+00 | 2.04e+10 | 0.00e+00 | 9.89e+09 |
| Ra-226 | 3.78e+13 | 1.21e+09 | 3.11e+13 | 0.00e+00 | 3.21e+10 | 0.00e+00 | 2.24e+10 |
| Ra-228 | 2.52e+13 | 6.53e+08 | 2.82e+13 | 0.00e+00 | 1.73e+10 | 0.00e+00 | 3.80e+09 |
| Ac-225 | 2.81e+05 | 2.89e+05 | 1.88e+04 | 0.00e+00 | 3.09e+04 | 0.00e+00 | 6.43e+06 |
| Ac-227 | 1.69e+08 | 2.72e+07 | 1.05e+07 | 0.00e+00 | 5.99e+06 | 0.00e+00 | 3.46e+06 |
| Th-227 | 1.27e+06 | 1.73e+04 | 3.67e+04 | 0.00e+00 | 9.17e+04 | 0.00e+00 | 1.22e+07 |
| Th-228 | 8.33e+07 | 1.07e+06 | 2.82e+06 | 0.00e+00 | 5.55e+06 | 0.00e+00 | 2.33e+07 |
| Th-229 | 9.67e+08 | 2.43e+07 | 1.61e+07 | 0.00e+00 | 1.19e+08 | 0.00e+00 | 3.31e+06 |
| Th-230 | 1.46e+08 | 7.32e+06 | 4.08e+06 | 0.00e+00 | 3.57e+07 | 0.00e+00 | 2.55e+06 |
| Th-232 | 1.63e+08 | 6.25e+06 | 1.24e+05 | 0.00e+00 | 3.05e+07 | 0.00e+00 | 2.17e+06 |
| Th-234 | 8.40e+03 | 3.71e+02 | 2.43e+02 | 0.00e+00 | 1.97e+03 | 0.00e+00 | 2.90e+06 |
| Pa-231 | 2.91e+08 | 9.63e+06 | 1.16e+07 | 0.00e+00 | 5.27e+07 | 0.00e+00 | 3.03e+06 |
| Pa-233 | 4.68e+02 | 7.30e+01 | 8.18e+01 | 0.00e+00 | 2.69e+02 | 0.00e+00 | 3.73e+05 |
| U-232 | 7.24e+10 | 0.00e+00 | 5.18e+09 | 0.00e+00 | 5.51e+09 | 0.00e+00 | 2.87e+08 |
| U-233 | 1.53e+10 | 0.00e+00 | 9.26e+08 | 0.00e+00 | 2.51e+09 | 0.00e+00 | 2.65e+08 |
| U-234 | 1.47e+10 | 0.00e+00 | 9.09e+08 | 0.00e+00 | 2.46e+09 | 0.00e+00 | 2.60e+08 |
| U-235 | 1.41e+10 | 0.00e+00 | 8.51e+08 | 0.00e+00 | 2.31e+09 | 0.00e+00 | 3.30e+08 |
| U-236 | 1.41e+10 | 0.00e+00 | 8.72e+08 | 0.00e+00 | 2.36e+09 | 0.00e+00 | 2.44e+08 |
| U-237 | 2.57e+05 | 0.00e+00 | 6.83e+04 | 0.00e+00 | 7.42e+05 | 0.00e+00 | 2.27e+07 |
| U-238 | 1.35e+10 | 0.00e+00 | 7.98e+08 | 0.00e+00 | 2.16e+09 | 0.00e+00 | 2.33e+08 |
| Np-237 | 9.17e+07 | 6.05e+06 | 4.03e+06 | 0.00e+00 | 2.49e+07 | 0.00e+00 | 3.36e+06 |

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Ri factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Cow's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Np-238 | 1.64e+02 | 3.32e+00 | 2.55e+00 | 0.00e+00 | 1.06e+01 | 0.00e+00 | 1.14e+05 |
| Np-239 | 1.73e+01 | 1.24e+00 | 8.71e-01 | 0.00e+00 | 3.58e+00 | 0.00e+00 | 9.17e+04 |
| Pu-238 | 1.96e+07 | 2.27e+06 | 5.20e+05 | 0.00e+00 | 1.89e+06 | 0.00e+00 | 1.23e+06 |
| Pu-239 | 2.12e+07 | 2.27e+06 | 5.45e+05 | 0.00e+00 | 2.01e+06 | 0.00e+00 | 1.13e+06 |
| Pu-240 | 2.11e+07 | 2.35e+06 | 5.45e+05 | 0.00e+00 | 2.01e+06 | 0.00e+00 | 1.15e+06 |
| Pu-241 | 6.35e+05 | 2.59e+04 | 1.32e+04 | 0.00e+00 | 4.86e+04 | 0.00e+00 | 2.36e+04 |
| Pu-242 | 1.96e+07 | 2.27e+06 | 5.25e+05 | 0.00e+00 | 1.93e+06 | 0.00e+00 | 1.10e+06 |
| Pu-244 | 2.29e+07 | 2.60e+07 | 6.01e+05 | 0.00e+00 | 2.22e+06 | 0.00e+00 | 1.65e+06 |
| Am-241 | 5.54e+07 | 4.77e+07 | 4.16e+06 | 0.00e+00 | 2.54e+07 | 0.00e+00 | 3.11e+06 |
| Am-242m | 5.76e+07 | 4.61e+07 | 4.28e+06 | 0.00e+00 | 2.59e+07 | 0.00e+00 | 3.95e+06 |
| Am-243 | 5.51e+07 | 4.65e+07 | 4.04e+06 | 0.00e+00 | 2.49e+07 | 0.00e+00 | 3.68e+06 |
| Cm-242 | 3.30e+06 | 2.63e+06 | 2.19e+05 | 0.00e+00 | 7.02e+05 | 0.00e+00 | 3.06e+06 |
| Cm-243 | 5.26e+07 | 4.27e+07 | 3.38e+06 | 0.00e+00 | 1.27e+07 | 0.00e+00 | 3.30e+06 |
| Cm-244 | 4.43e+07 | 3.59e+07 | 2.84e+06 | 0.00e+00 | 1.04e+07 | 0.00e+00 | 3.19e+06 |
| Cm-245 | 6.87e+07 | 5.51e+07 | 4.32e+06 | 0.00e+00 | 1.69e+07 | 0.00e+00 | 2.98e+06 |
| Cm-246 | 6.79e+07 | 5.51e+07 | 4.32e+06 | 0.00e+00 | 1.69e+07 | 0.00e+00 | 2.92e+06 |
| Cm-247 | 6.62e+07 | 5.43e+07 | 4.24e+06 | 0.00e+00 | 1.66e+07 | 0.00e+00 | 3.85e+06 |
| Cm-248 | 5.51e+08 | 4.48e+08 | 3.50e+07 | 0.00e+00 | 1.37e+08 | 0.00e+00 | 6.21e+07 |
| Cf-252 | 4.25e+07 | 0.00e+00 | 1.03e+06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.20e+07 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

Ri factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Cow's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| H-3 | 0.00e+00 | 1.36e+03 | 1.36e+03 | 1.36e+03 | 1.36e+03 | 1.36e+03 | 1.36e+03 |
| Be-10 | 1.41e+07 | 2.05e+06 | 4.25e+05 | 0.00e+00 | 1.35e+06 | 0.00e+00 | 2.29e+07 |
| C-14 | 2.34e+09 | 5.00e+08 | 5.00e+08 | 5.00e+08 | 5.00e+08 | 5.00e+08 | 5.00e+08 |
| N-13 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| F-18 | 4.12e-02 | 0.00e+00 | 3.51e-03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 9.67e-03 |
| Na-22 | 3.18e+10 | 3.18e+10 | 3.18e+10 | 3.18e+10 | 3.18e+10 | 3.18e+10 | 3.18e+10 |
| Na-24 | 1.55e+07 | 1.55e+07 | 1.55e+07 | 1.55e+07 | 1.55e+07 | 1.55e+07 | 1.55e+07 |
| P-32 | 1.60e+11 | 9.43e+09 | 6.21e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.17e+09 |
| Ca-41 | 2.46e+10 | 0.00e+00 | 2.69e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.26e+07 |
| Sc-46 | 1.30e+03 | 1.88e+03 | 5.86e+02 | 0.00e+00 | 1.23e+03 | 0.00e+00 | 1.22e+06 |
| Cr-51 | 0.00e+00 | 0.00e+00 | 1.61e+05 | 1.05e+05 | 2.30e+04 | 2.05e+05 | 4.70e+06 |
| Mn-54 | 0.00e+00 | 3.90e+07 | 8.84e+06 | 0.00e+00 | 8.64e+06 | 0.00e+00 | 1.43e+07 |
| Mn-56 | 0.00e+00 | 3.14e-02 | 5.42e-03 | 0.00e+00 | 2.70e-02 | 0.00e+00 | 2.86e+00 |
| Fe-55 | 1.35e+08 | 8.73e+07 | 2.33e+07 | 0.00e+00 | 0.00e+00 | 4.27e+07 | 1.11e+07 |
| Fe-59 | 2.24e+08 | 3.92e+08 | 1.54e+08 | 0.00e+00 | 0.00e+00 | 1.16e+08 | 1.87e+08 |
| Co-57 | 0.00e+00 | 8.95e+06 | 1.46e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.05e+07 |
| Co-58 | 0.00e+00 | 2.42e+07 | 6.05e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.04e+07 |
| Co-60 | 0.00e+00 | 8.81e+07 | 2.08e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.10e+08 |
| Ni-59 | 2.61e+09 | 7.99e+08 | 4.50e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.95e+07 |
| Ni-63 | 3.49e+10 | 2.16e+09 | 1.21e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.07e+08 |
| Ni-65 | 3.56e+00 | 4.03e-01 | 1.83e-01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.07e+01 |
| Cu-64 | 0.00e+00 | 1.86e+05 | 8.62e+04 | 0.00e+00 | 3.15e+05 | 0.00e+00 | 3.82e+06 |
| Zn-65 | 5.55e+09 | 1.90e+10 | 8.78e+09 | 0.00e+00 | 9.23e+09 | 0.00e+00 | 1.61e+10 |
| Zn-69 | 2.10e-11 | 3.79e-11 | 2.82e-12 | 0.00e+00 | 1.57e-11 | 0.00e+00 | 3.09e-09 |
| Zn-69m | 1.70e+06 | 3.48e+06 | 3.17e+05 | 0.00e+00 | 1.41e+06 | 0.00e+00 | 4.82e+07 |
| Se-79 | 0.00e+00 | 7.77e+09 | 1.44e+09 | 0.00e+00 | 9.00e+09 | 0.00e+00 | 2.07e+08 |
| Br-82 | 0.00e+00 | 0.00e+00 | 1.93e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-83 | 0.00e+00 | 0.00e+00 | 9.49e-01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-84 | 0.00e+00 | 0.00e+00 | 1.35e-22 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-85 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

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Ri factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Cow's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Rb-86 | 0.00e+00 | 2.23e+10 | 1.10e+10 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.69e+08 |
| Rb-87 | 0.00e+00 | 2.19e+10 | 8.69e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.48e+08 |
| Rb-88 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Rb-89 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sr-89 | 1.26e+10 | 0.00e+00 | 3.61e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.59e+08 |
| Sr-90 | 1.86e+11 | 0.00e+00 | 3.77e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.52e+09 |
| Sr-91 | 2.73e+05 | 0.00e+00 | 9.87e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.23e+05 |
| Sr-92 | 4.71e+00 | 0.00e+00 | 1.75e-01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.08e+01 |
| Y-90 | 6.82e+02 | 0.00e+00 | 1.83e+01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 9.41e+05 |
| Y-91 | 7.33e+04 | 0.00e+00 | 1.95e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.25e+06 |
| Y-91m | 5.94e-19 | 0.00e+00 | 2.03e-20 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.98e-15 |
| Y-92 | 5.44e-04 | 0.00e+00 | 1.53e-05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.04e+01 |
| Y-93 | 2.16e+00 | 0.00e+00 | 5.90e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.71e+04 |
| Zr-93 | 7.94e+03 | 3.78e+02 | 2.28e+02 | 0.00e+00 | 1.11e+03 | 0.00e+00 | 9.83e+04 |
| Zr-95 | 6.80e+03 | 1.66e+03 | 1.18e+03 | 0.00e+00 | 1.79e+03 | 0.00e+00 | 8.26e+05 |
| Zr-97 | 4.07e+00 | 6.99e-01 | 3.19e-01 | 0.00e+00 | 7.04e-01 | 0.00e+00 | 4.46e+04 |
| Nb-93m | 2.52e+06 | 6.83e+05 | 2.13e+05 | 0.00e+00 | 6.66e+05 | 0.00e+00 | 8.16e+07 |
| Nb-95 | 5.93e+05 | 2.44e+05 | 1.41e+05 | 0.00e+00 | 1.75e+05 | 0.00e+00 | 2.06e+08 |
| Nb-97 | 6.16e-11 | 1.31e-11 | 4.74e-12 | 0.00e+00 | 1.03e-11 | 0.00e+00 | 4.15e-06 |
| Mo-93 | 0.00e+00 | 3.49e+09 | 1.12e+08 | 0.00e+00 | 6.97e+08 | 0.00e+00 | 7.47e+07 |
| Mo-99 | 0.00e+00 | 2.08e+08 | 4.06e+07 | 0.00e+00 | 3.11e+08 | 0.00e+00 | 6.86e+07 |
| Tc-101 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Tc-99 | 2.22e+08 | 3.00e+08 | 9.36e+07 | 0.00e+00 | 2.53e+09 | 2.92e+07 | 1.30e+09 |
| Tc-99m | 2.77e+01 | 5.70e+01 | 7.35e+02 | 0.00e+00 | 6.14e+02 | 2.98e+01 | 1.66e+04 |
| Ru-103 | 8.67e+03 | 0.00e+00 | 2.90e+03 | 0.00e+00 | 1.80e+04 | 0.00e+00 | 1.05e+05 |
| Ru-105 | 8.12e-03 | 0.00e+00 | 2.74e-03 | 0.00e+00 | 5.97e-02 | 0.00e+00 | 3.23e+00 |
| Ru-106 | 1.90e+05 | 0.00e+00 | 2.38e+04 | 0.00e+00 | 2.25e+05 | 0.00e+00 | 1.44e+06 |
| Rh-105 | 3.32e+06 | 2.17e+06 | 1.46e+06 | 0.00e+00 | 6.03e+06 | 0.00e+00 | 5.39e+07 |
| Pd-107 | 0.00e+00 | 9.79e+07 | 6.95e+06 | 0.00e+00 | 5.59e+08 | 0.00e+00 | 7.78e+07 |
| Pd-109 | 0.00e+00 | 4.05e+05 | 9.78e+04 | 0.00e+00 | 1.49e+06 | 0.00e+00 | 9.95e+06 |

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Ri factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Cow's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ag-110m | 3.86e+08 | 2.82e+08 | 1.86e+08 | 0.00e+00 | 4.03e+08 | 0.00e+00 | 1.46e+10 |
| Ag-111 | 6.17e+07 | 2.40e+07 | 1.27e+07 | 0.00e+00 | 5.01e+07 | 0.00e+00 | 5.72e+09 |
| Cd-113m | 0.00e+00 | 1.74e+07 | 6.42e+05 | 0.00e+00 | 1.32e+07 | 0.00e+00 | 2.62e+07 |
| Cd-115m | 0.00e+00 | 1.03e+07 | 3.59e+05 | 0.00e+00 | 5.40e+06 | 0.00e+00 | 5.89e+07 |
| Sn-123 | 4.57e+09 | 7.14e+07 | 1.19e+08 | 7.18e+07 | 0.00e+00 | 0.00e+00 | 1.21e+09 |
| Sn-125 | 5.37e+08 | 1.00e+07 | 2.39e+07 | 9.86e+06 | 0.00e+00 | 0.00e+00 | 8.05e+08 |
| Sn-126 | 1.14e+10 | 1.49e+08 | 3.70e+08 | 3.93e+07 | 0.00e+00 | 0.00e+00 | 5.18e+08 |
| Sb-124 | 2.09e+08 | 3.08e+06 | 6.49e+07 | 5.56e+05 | 0.00e+00 | 1.31e+08 | 6.46e+08 |
| Sb-125 | 1.50e+08 | 1.45e+06 | 3.08e+07 | 1.87e+05 | 0.00e+00 | 8.65e+07 | 1.99e+08 |
| Sb-126 | 4.20e+07 | 8.23e+05 | 1.52e+07 | 3.22e+05 | 0.00e+00 | 2.64e+07 | 4.35e+08 |
| Sb-127 | 4.17e+06 | 7.44e+04 | 1.29e+06 | 5.31e+04 | 0.00e+00 | 2.15e+06 | 1.11e+08 |
| Te-125m | 1.51e+08 | 5.04e+07 | 2.04e+07 | 5.07e+07 | 0.00e+00 | 0.00e+00 | 7.18e+07 |
| Te-127 | 6.34e+03 | 2.13e+03 | 1.36e+03 | 5.16e+03 | 1.55e+04 | 0.00e+00 | 1.33e+05 |
| Te-127m | 4.21e+08 | 1.40e+08 | 5.10e+07 | 1.22e+08 | 1.04e+09 | 0.00e+00 | 1.70e+08 |
| Te-129 | 2.81e-09 | 9.69e-10 | 6.56e-10 | 2.36e-09 | 7.00e-09 | 0.00e+00 | 2.25e-07 |
| Te-129m | 5.57e+08 | 1.91e+08 | 8.58e+07 | 2.14e+08 | 1.39e+09 | 0.00e+00 | 3.33e+08 |
| Te-131 | 3.76e-32 | 1.39e-32 | 1.05e-32 | 3.35e-32 | 9.61e-32 | 0.00e+00 | 1.52e-30 |
| Te-131m | 3.38e+06 | 1.36e+06 | 1.12e+06 | 2.76e+06 | 9.36e+06 | 0.00e+00 | 2.29e+07 |
| Te-132 | 2.11e+07 | 1.05e+07 | 9.75e+06 | 1.54e+07 | 6.54e+07 | 0.00e+00 | 3.87e+07 |
| Te-133m | 1.98e-12 | 9.05e-13 | 8.65e-13 | 1.74e-12 | 6.17e-12 | 0.00e+00 | 9.76e-11 |
| Te-134 | 8.25e-18 | 4.14e-18 | 4.27e-18 | 7.39e-18 | 2.79e-17 | 0.00e+00 | 9.46e-17 |
| I-129 | 7.06e+09 | 5.23e+09 | 3.83e+09 | 3.36e+12 | 6.19e+09 | 0.00e+00 | 1.05e+08 |
| I-130 | 3.56e+06 | 7.83e+06 | 3.14e+06 | 8.78e+08 | 8.60e+06 | 0.00e+00 | 1.68e+06 |
| I-131 | 2.72e+09 | 3.21e+09 | 1.41e+09 | 1.05e+12 | 3.74e+09 | 0.00e+00 | 1.14e+08 |
| I-132 | 1.45e+00 | 2.95e+00 | 1.05e+00 | 1.38e+02 | 3.29e+00 | 0.00e+00 | 2.39e+00 |
| I-133 | 3.63e+07 | 5.29e+07 | 1.55e+07 | 9.62e+09 | 6.22e+07 | 0.00e+00 | 8.95e+06 |
| I-134 | 1.84e-11 | 3.77e-11 | 1.34e-11 | 8.78e-10 | 4.21e-11 | 0.00e+00 | 3.89e-11 |
| I-135 | 1.13e+05 | 2.25e+05 | 8.19e+04 | 2.01e+07 | 2.50e+05 | 0.00e+00 | 8.13e+04 |
| Cs-134 | 3.65e+10 | 6.80e+10 | 6.87e+09 | 0.00e+00 | 1.75e+10 | 7.18e+09 | 1.85e+08 |
| Cs-134m | 1.55e+00 | 2.58e+00 | 1.30e+00 | 0.00e+00 | 9.94e-01 | 2.29e-01 | 2.04e+00 |

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Ri factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Cow's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Cs-135 | 1.31e+10 | 1.19e+10 | 6.22e+08 | 0.00e+00 | 3.40e+09 | 1.29e+09 | 4.31e+07 |
| Cs-136 | 1.98e+09 | 5.81e+09 | 2.17e+09 | 0.00e+00 | 2.32e+09 | 4.74e+08 | 8.83e+07 |
| Cs-137 | 5.15e+10 | 6.02e+10 | 4.27e+09 | 0.00e+00 | 1.62e+10 | 6.55e+09 | 1.88e+08 |
| Cs-138 | 9.01e-23 | 1.47e-22 | 7.10e-23 | 0.00e+00 | 7.31e-23 | 1.14e-23 | 2.34e-22 |
| Cs-139 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-139 | 4.39e-07 | 2.91e-10 | 1.27e-08 | 0.00e+00 | 1.75e-10 | 1.77e-10 | 2.78e-05 |
| Ba-140 | 2.41e+08 | 2.41e+05 | 1.24e+07 | 0.00e+00 | 5.72e+04 | 1.48e+05 | 5.92e+07 |
| Ba-141 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-142 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| La-140 | 4.06e+01 | 1.60e+01 | 4.11e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.88e+05 |
| La-141 | 2.89e-04 | 8.39e-05 | 1.46e-05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 9.62e+00 |
| La-142 | 1.74e-10 | 6.40e-11 | 1.53e-11 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.09e-05 |
| Ce-141 | 4.34e+04 | 2.64e+04 | 3.11e+03 | 0.00e+00 | 8.15e+03 | 0.00e+00 | 1.37e+07 |
| Ce-143 | 3.97e+02 | 2.64e+05 | 3.01e+01 | 0.00e+00 | 7.68e+01 | 0.00e+00 | 1.54e+06 |
| Ce-144 | 2.33e+06 | 9.52e+05 | 1.30e+05 | 0.00e+00 | 3.85e+05 | 0.00e+00 | 1.33e+08 |
| Pr-143 | 1.49e+03 | 5.55e+02 | 7.36e+01 | 0.00e+00 | 2.06e+02 | 0.00e+00 | 7.84e+05 |
| Pr-144 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Nd-147 | 8.81e+02 | 9.05e+02 | 5.55e+01 | 0.00e+00 | 3.49e+02 | 0.00e+00 | 5.74e+05 |
| Pm-147 | 1.57e+04 | 1.32e+03 | 6.44e+02 | 0.00e+00 | 1.98e+03 | 0.00e+00 | 3.75e+05 |
| Pm-148 | 5.57e+02 | 8.04e+01 | 4.05e+01 | 0.00e+00 | 9.60e+01 | 0.00e+00 | 8.58e+05 |
| Pm-148m | 4.90e+03 | 1.24e+03 | 9.74e+02 | 0.00e+00 | 1.43e+03 | 0.00e+00 | 1.62e+06 |
| Pm-149 | 4.13e+01 | 5.42e+00 | 2.37e+00 | 0.00e+00 | 6.59e+00 | 0.00e+00 | 1.46e+05 |
| Pm-151 | 6.10e+00 | 8.90e-01 | 4.50e-01 | 0.00e+00 | 1.06e+00 | 0.00e+00 | 4.12e+04 |
| Sm-151 | 1.19e+04 | 2.74e+03 | 5.92e+02 | 0.00e+00 | 1.86e+03 | 0.00e+00 | 2.29e+05 |
| Sm-153 | 1.91e+01 | 1.47e+01 | 1.13e+00 | 0.00e+00 | 3.09e+00 | 0.00e+00 | 7.71e+04 |
| Eu-152 | 2.76e+04 | 7.34e+03 | 6.19e+03 | 0.00e+00 | 2.06e+04 | 0.00e+00 | 6.52e+05 |
| Eu-154 | 1.09e+05 | 1.51e+04 | 9.05e+03 | 0.00e+00 | 4.09e+04 | 0.00e+00 | 1.88e+06 |
| Eu-155 | 2.18e+04 | 2.51e+03 | 1.30e+03 | 0.00e+00 | 5.63e+03 | 0.00e+00 | 3.36e+06 |
| Eu-156 | 2.23e+03 | 1.38e+03 | 2.19e+02 | 0.00e+00 | 6.37e+02 | 0.00e+00 | 1.30e+06 |
| Tb-160 | 8.75e+03 | 0.00e+00 | 1.09e+03 | 0.00e+00 | 2.49e+03 | 0.00e+00 | 1.17e+06 |

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Ri factors for Infant age group by nuclide.
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| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ho-166m | 5.14e+04 | 1.11e+04 | 8.76e+03 | 0.00e+00 | 1.47e+04 | 0.00e+00 | 1.09e+06 |
| W-181 | 3.23e+05 | 9.91e+04 | 1.11e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.39e+06 |
| W-185 | 1.23e+07 | 3.85e+06 | 4.39e+05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.51e+07 |
| W-187 | 6.09e+04 | 4.23e+04 | 1.46e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.49e+06 |
| Pb-210 | 2.69e+11 | 7.23e+10 | 1.21e+10 | 0.00e+00 | 2.20e+11 | 0.00e+00 | 1.18e+07 |
| Bi-210 | 3.42e+06 | 2.20e+07 | 1.96e+06 | 0.00e+00 | 1.71e+08 | 0.00e+00 | 4.33e+07 |
| Po-210 | 6.88e+09 | 1.32e+10 | 1.64e+09 | 0.00e+00 | 2.80e+10 | 0.00e+00 | 1.47e+08 |
| Ra-223 | 1.15e+12 | 1.68e+09 | 2.31e+11 | 0.00e+00 | 3.06e+10 | 0.00e+00 | 8.97e+09 |
| Ra-224 | 1.36e+11 | 3.07e+08 | 2.72e+10 | 0.00e+00 | 5.60e+09 | 0.00e+00 | 3.60e+09 |
| Ra-225 | 1.78e+12 | 2.01e+09 | 3.54e+11 | 0.00e+00 | 3.66e+10 | 0.00e+00 | 9.98e+09 |
| Ra-226 | 4.08e+13 | 3.13e+09 | 3.38e+13 | 0.00e+00 | 5.73e+10 | 0.00e+00 | 2.26e+10 |
| Ra-228 | 2.82e+13 | 1.69e+09 | 3.18e+13 | 0.00e+00 | 3.09e+10 | 0.00e+00 | 3.83e+09 |
| Ac-225 | 5.85e+05 | 7.51e+05 | 3.92e+04 | 0.00e+00 | 5.51e+04 | 0.00e+00 | 6.51e+06 |
| Ac-227 | 1.84e+08 | 3.15e+07 | 1.15e+07 | 0.00e+00 | 6.40e+06 | 0.00e+00 | 3.49e+06 |
| Th-227 | 2.61e+06 | 4.37e+04 | 7.49e+04 | 0.00e+00 | 1.61e+05 | 0.00e+00 | 1.24e+07 |
| Th-228 | 9.94e+07 | 1.36e+06 | 3.36e+06 | 0.00e+00 | 6.36e+06 | 0.00e+00 | 2.35e+07 |
| Th-229 | 1.04e+09 | 2.60e+07 | 1.73e+07 | 0.00e+00 | 1.25e+08 | 0.00e+00 | 3.33e+06 |
| Th-230 | 1.56e+08 | 7.82e+06 | 4.36e+06 | 0.00e+00 | 3.75e+07 | 0.00e+00 | 2.57e+06 |
| Th-232 | 1.74e+08 | 6.70e+06 | 6.79e+04 | 0.00e+00 | 3.20e+07 | 0.00e+00 | 2.18e+06 |
| Th-234 | 1.70e+04 | 9.26e+02 | 4.91e+02 | 0.00e+00 | 3.41e+03 | 0.00e+00 | 2.92e+06 |
| Pa-231 | 3.11e+08 | 1.03e+07 | 1.24e+07 | 0.00e+00 | 5.51e+07 | 0.00e+00 | 3.06e+06 |
| Pa-233 | 8.05e+02 | 1.58e+02 | 1.41e+02 | 0.00e+00 | 4.32e+02 | 0.00e+00 | 3.78e+05 |
| U-232 | 9.95e+10 | 0.00e+00 | 8.88e+09 | 0.00e+00 | 9.74e+09 | 0.00e+00 | 2.89e+08 |
| U-233 | 2.09e+10 | 0.00e+00 | 1.59e+09 | 0.00e+00 | 4.44e+09 | 0.00e+00 | 2.68e+08 |
| U-234 | 2.01e+10 | 0.00e+00 | 1.56e+09 | 0.00e+00 | 4.36e+09 | 0.00e+00 | 2.62e+08 |
| U-235 | 1.92e+10 | 0.00e+00 | 1.46e+09 | 0.00e+00 | 4.08e+09 | 0.00e+00 | 3.33e+08 |
| U-236 | 1.92e+10 | 0.00e+00 | 1.50e+09 | 0.00e+00 | 4.15e+09 | 0.00e+00 | 2.46e+08 |
| U-237 | 5.39e+05 | 0.00e+00 | 1.44e+05 | 0.00e+00 | 1.34e+06 | 0.00e+00 | 2.30e+07 |
| U-238 | 1.84e+10 | 0.00e+00 | 1.37e+09 | 0.00e+00 | 3.82e+09 | 0.00e+00 | 2.35e+08 |
| Np-237 | 9.87e+07 | 6.54e+06 | 4.32e+06 | 0.00e+00 | 2.61e+07 | 0.00e+00 | 3.39e+06 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

Ri factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Cow's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Np-238 | 3.49e+02 | 8.78e+00 | 5.40e+00 | 0.00e+00 | 1.92e+01 | 0.00e+00 | 1.17e+05 |
| Np-239 | 3.65e+01 | 3.26e+00 | 1.84e+00 | 0.00e+00 | 6.51e+00 | 0.00e+00 | 9.44e+04 |
| Pu-238 | 2.11e+07 | 2.47e+06 | 5.59e+05 | 0.00e+00 | 1.99e+06 | 0.00e+00 | 1.24e+06 |
| Pu-239 | 2.27e+07 | 2.55e+06 | 5.82e+05 | 0.00e+00 | 2.11e+06 | 0.00e+00 | 1.14e+06 |
| Pu-240 | 2.27e+07 | 2.55e+06 | 5.82e+05 | 0.00e+00 | 2.11e+06 | 0.00e+00 | 1.16e+06 |
| Pu-241 | 6.97e+05 | 2.89e+04 | 1.45e+04 | 0.00e+00 | 5.20e+04 | 0.00e+00 | 2.38e+04 |
| Pu-242 | 2.11e+07 | 2.45e+06 | 5.61e+05 | 0.00e+00 | 2.02e+06 | 0.00e+00 | 1.11e+06 |
| Pu-244 | 2.45e+07 | 2.81e+06 | 6.43e+05 | 0.00e+00 | 2.32e+06 | 0.00e+00 | 1.66e+06 |
| Am-241 | 5.95e+07 | 5.17e+07 | 4.44e+06 | 0.00e+00 | 2.67e+07 | 0.00e+00 | 3.14e+06 |
| Am-242m | 6.21e+07 | 5.02e+07 | 4.65e+06 | 0.00e+00 | 2.73e+07 | 0.00e+00 | 3.98e+06 |
| Am-243 | 5.92e+07 | 5.06e+07 | 4.36e+06 | 0.00e+00 | 2.62e+07 | 0.00e+00 | 3.71e+06 |
| Cm-242 | 5.15e+06 | 4.77e+06 | 3.42e+05 | 0.00e+00 | 9.84e+05 | 0.00e+00 | 3.09e+06 |
| Cm-243 | 5.75e+07 | 4.72e+07 | 3.69e+06 | 0.00e+00 | 1.34e+07 | 0.00e+00 | 3.33e+06 |
| Cm-244 | 4.84e+07 | 3.98e+07 | 3.11e+06 | 0.00e+00 | 1.11e+07 | 0.00e+00 | 3.22e+06 |
| Cm-245 | 7.36e+07 | 5.96e+07 | 4.65e+06 | 0.00e+00 | 1.78e+07 | 0.00e+00 | 3.00e+06 |
| Cm-246 | 7.28e+07 | 5.96e+07 | 4.65e+06 | 0.00e+00 | 1.77e+07 | 0.00e+00 | 2.95e+06 |
| Cm-247 | 7.12e+07 | 5.88e+07 | 4.57e+06 | 0.00e+00 | 1.74e+07 | 0.00e+00 | 3.88e+06 |
| Cm-248 | 5.88e+08 | 4.85e+08 | 3.77e+07 | 0.00e+00 | 1.44e+08 | 0.00e+00 | 6.25e+07 |
| Cf-252 | 4.93e+07 | 0.00e+00 | 1.19e+06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.21e+07 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# MEAT PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Meat & Poultry Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| H-3 | 0.00e+00 | 1.85e+02 | 1.85e+02 | 1.85e+02 | 1.85e+02 | 1.85e+02 | 1.85e+02 |
| Be-10 | 8.72e+06 | 1.35e+06 | 2.18e+05 | 0.00e+00 | 1.02e+06 | 0.00e+00 | 7.35e+07 |
| C-14 | 2.41e+08 | 4.83e+07 | 4.83e+07 | 4.83e+07 | 4.83e+07 | 4.83e+07 | 4.83e+07 |
| N-13 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| F-18 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Na-22 | 1.39e+09 | 1.39e+09 | 1.39e+09 | 1.39e+09 | 1.39e+09 | 1.39e+09 | 1.39e+09 |
| Na-24 | 1.39e-03 | 1.39e-03 | 1.39e-03 | 1.39e-03 | 1.39e-03 | 1.39e-03 | 1.39e-03 |
| P-32 | 4.66e+09 | 2.90e+08 | 1.80e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.24e+08 |
| Ca-41 | 2.03e+09 | 0.00e+00 | 2.19e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.02e+06 |
| Sc-46 | 1.76e+05 | 3.41e+05 | 9.91e+04 | 0.00e+00 | 3.18e+05 | 0.00e+00 | 1.66e+09 |
| Cr-51 | 0.00e+00 | 0.00e+00 | 7.05e+03 | 4.21e+03 | 1.55e+03 | 9.36e+03 | 1.77e+06 |
| Mn-54 | 0.00e+00 | 9.18e+06 | 1.75e+06 | 0.00e+00 | 2.73e+06 | 0.00e+00 | 2.81e+07 |
| Mn-56 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Fe-55 | 2.93e+08 | 2.03e+08 | 4.72e+07 | 0.00e+00 | 0.00e+00 | 1.13e+08 | 1.16e+08 |
| Fe-59 | 2.66e+08 | 6.24e+08 | 2.39e+08 | 0.00e+00 | 0.00e+00 | 1.74e+08 | 2.08e+09 |
| Co-57 | 0.00e+00 | 5.63e+06 | 9.37e+06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.43e+08 |
| Co-58 | 0.00e+00 | 1.82e+07 | 4.09e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.70e+08 |
| Co-60 | 0.00e+00 | 7.52e+07 | 1.66e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.41e+09 |
| Ni-59 | 1.42e+08 | 4.87e+07 | 2.37e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.00e+07 |
| Ni-63 | 1.89e+09 | 1.31e+08 | 6.33e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.73e+07 |
| Ni-65 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cu-64 | 0.00e+00 | 2.80e-07 | 1.31e-07 | 0.00e+00 | 7.05e-07 | 0.00e+00 | 2.38e-05 |
| Zn-65 | 3.56e+08 | 1.13e+09 | 5.12e+08 | 0.00e+00 | 7.57e+08 | 0.00e+00 | 7.13e+08 |
| Zn-69 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Zn-69m | 1.87e-05 | 4.48e-05 | 4.10e-06 | 0.00e+00 | 2.71e-05 | 0.00e+00 | 2.73e-03 |
| Se-79 | 0.00e+00 | 1.08e+08 | 1.81e+07 | 0.00e+00 | 1.87e+08 | 0.00e+00 | 2.21e+07 |
| Br-82 | 0.00e+00 | 0.00e+00 | 1.23e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.41e+03 |
| Br-83 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-84 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-85 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# MEAT PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Meat & Poultry Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Rb-86 | 0.00e+00 | 4.88e+08 | 2.27e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 9.61e+07 |
| Rb-87 | 0.00e+00 | 1.05e+09 | 3.64e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.90e+07 |
| Rb-88 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Rb-89 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sr-89 | 3.02e+08 | 0.00e+00 | 8.66e+06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.84e+07 |
| Sr-90 | 1.43e+10 | 0.00e+00 | 2.87e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.59e+08 |
| Sr-91 | 1.58e-10 | 0.00e+00 | 6.39e-12 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.53e-10 |
| Sr-92 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Y-90 | 1.08e+02 | 0.00e+00 | 2.90e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.15e+06 |
| Y-91 | 1.13e+06 | 0.00e+00 | 3.03e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.23e+08 |
| Y-91m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Y-92 | 1.69e-39 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.96e-35 |
| Y-93 | 4.87e-12 | 0.00e+00 | 1.35e-13 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.55e-07 |
| Zr-93 | 3.90e+06 | 2.18e+05 | 1.02e+05 | 0.00e+00 | 8.27e+05 | 0.00e+00 | 2.27e+08 |
| Zr-95 | 1.87e+06 | 6.01e+05 | 4.07e+05 | 0.00e+00 | 9.43e+05 | 0.00e+00 | 1.90e+09 |
| Zr-97 | 2.11e-05 | 4.27e-06 | 1.95e-06 | 0.00e+00 | 6.44e-06 | 0.00e+00 | 1.32e+00 |
| Nb-93m | 1.95e+07 | 6.35e+06 | 1.57e+06 | 0.00e+00 | 7.31e+06 | 0.00e+00 | 2.93e+09 |
| Nb-95 | 2.30e+06 | 1.28e+06 | 6.87e+05 | 0.00e+00 | 1.26e+06 | 0.00e+00 | 7.76e+09 |
| Nb-97 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Mo-93 | 0.00e+00 | 1.65e+08 | 4.45e+06 | 0.00e+00 | 4.67e+07 | 0.00e+00 | 2.68e+07 |
| Mo-99 | 0.00e+00 | 1.01e+05 | 1.91e+04 | 0.00e+00 | 2.28e+05 | 0.00e+00 | 2.33e+05 |
| Tc-101 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Tc-99 | 1.37e+08 | 2.04e+08 | 5.51e+07 | 0.00e+00 | 2.57e+09 | 1.73e+07 | 6.67e+09 |
| Tc-99m | 4.74e-21 | 1.34e-20 | 1.71e-19 | 0.00e+00 | 2.04e-19 | 6.57e-21 | 7.93e-18 |
| Ru-103 | 1.05e+08 | 0.00e+00 | 4.53e+07 | 0.00e+00 | 4.02e+08 | 0.00e+00 | 1.23e+10 |
| Ru-105 | 6.30e-28 | 0.00e+00 | 2.49e-28 | 0.00e+00 | 8.14e-27 | 0.00e+00 | 3.85e-25 |
| Ru-106 | 2.80e+09 | 0.00e+00 | 3.54e+08 | 0.00e+00 | 5.40e+09 | 0.00e+00 | 1.81e+11 |
| Rh-105 | 3.79e+00 | 2.78e+00 | 1.83e+00 | 0.00e+00 | 1.18e+01 | 0.00e+00 | 4.42e+02 |
| Pd-107 | 0.00e+00 | 1.61e+06 | 1.03e+05 | 0.00e+00 | 1.45e+07 | 0.00e+00 | 9.99e+06 |
| Pd-109 | 0.00e+00 | 1.49e-06 | 3.35e-07 | 0.00e+00 | 8.47e-06 | 0.00e+00 | 1.64e-04 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# MEAT PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Meat & Poultry Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ag-110m | 6.68e+06 | 6.18e+06 | 3.67e+06 | 0.00e+00 | 1.22e+07 | 0.00e+00 | 2.52e+09 |
| Ag-111 | 1.46e+05 | 6.12e+04 | 3.05e+04 | 0.00e+00 | 1.97e+05 | 0.00e+00 | 1.12e+08 |
| Cd-113m | 0.00e+00 | 4.60e+06 | 1.47e+05 | 0.00e+00 | 5.06e+06 | 0.00e+00 | 3.70e+07 |
| Cd-115m | 0.00e+00 | 1.49e+06 | 4.76e+04 | 0.00e+00 | 1.18e+06 | 0.00e+00 | 6.27e+07 |
| Sn-123 | 5.53e+09 | 9.15e+07 | 1.35e+08 | 7.78e+07 | 0.00e+00 | 0.00e+00 | 1.13e+10 |
| Sn-125 | 1.76e+08 | 3.55e+06 | 7.99e+06 | 2.94e+06 | 0.00e+00 | 0.00e+00 | 2.20e+09 |
| Sn-126 | 1.85e+10 | 3.66e+08 | 5.27e+08 | 1.08e+08 | 0.00e+00 | 0.00e+00 | 5.33e+09 |
| Sb-124 | 1.98e+07 | 3.74e+05 | 7.85e+06 | 4.80e+04 | 0.00e+00 | 1.54e+07 | 5.62e+08 |
| Sb-125 | 1.91e+07 | 2.13e+05 | 4.55e+06 | 1.94e+04 | 0.00e+00 | 1.47e+07 | 2.10e+08 |
| Sb-126 | 1.96e+06 | 3.99e+04 | 7.08e+05 | 1.20e+04 | 0.00e+00 | 1.20e+06 | 1.60e+08 |
| Sb-127 | 1.71e+04 | 3.75e+02 | 6.58e+03 | 2.06e+02 | 0.00e+00 | 1.02e+04 | 3.92e+06 |
| Te-125m | 3.59e+08 | 1.30e+08 | 4.81e+07 | 1.08e+08 | 1.46e+09 | 0.00e+00 | 1.43e+09 |
| Te-127 | 2.21e-10 | 7.94e-11 | 4.78e-11 | 1.64e-10 | 9.01e-10 | 0.00e+00 | 1.74e-08 |
| Te-127m | 1.12e+09 | 3.99e+08 | 1.36e+08 | 2.85e+08 | 4.53e+09 | 0.00e+00 | 3.74e+09 |
| Te-129 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Te-129m | 1.13e+09 | 4.23e+08 | 1.80e+08 | 3.90e+08 | 4.74e+09 | 0.00e+00 | 5.71e+09 |
| Te-131 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Te-131m | 4.57e+02 | 2.23e+02 | 1.86e+02 | 3.54e+02 | 2.26e+03 | 0.00e+00 | 2.22e+04 |
| Te-132 | 1.43e+06 | 9.23e+05 | 8.66e+05 | 1.02e+06 | 8.89e+06 | 0.00e+00 | 4.36e+07 |
| Te-133m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Te-134 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| I-129 | 1.30e+08 | 1.12e+08 | 3.66e+08 | 2.87e+11 | 2.40e+08 | 0.00e+00 | 1.77e+07 |
| I-130 | 2.18e-06 | 6.42e-06 | 2.53e-06 | 5.44e-04 | 1.00e-05 | 0.00e+00 | 5.52e-06 |
| I-131 | 1.08e+07 | 1.54e+07 | 8.82e+06 | 5.04e+09 | 2.64e+07 | 0.00e+00 | 4.06e+06 |
| I-132 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| I-133 | 3.72e-01 | 6.47e-01 | 1.97e-01 | 9.51e+01 | 1.13e+00 | 0.00e+00 | 5.82e-01 |
| I-134 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| I-135 | 4.69e-17 | 1.23e-16 | 4.53e-17 | 8.10e-15 | 1.97e-16 | 0.00e+00 | 1.39e-16 |
| Cs-134 | 6.58e+08 | 1.56e+09 | 1.28e+09 | 0.00e+00 | 5.06e+08 | 1.68e+08 | 2.74e+07 |
| Cs-134m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# MEAT PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Meat & Poultry Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Cs-135 | 2.14e+08 | 1.97e+08 | 8.76e+07 | 0.00e+00 | 7.47e+07 | 2.24e+07 | 4.62e+06 |
| Cs-136 | 1.21e+07 | 4.76e+07 | 3.43e+07 | 0.00e+00 | 2.65e+07 | 3.63e+06 | 5.41e+06 |
| Cs-137 | 8.72e+08 | 1.19e+09 | 7.81e+08 | 0.00e+00 | 4.05e+08 | 1.35e+08 | 2.31e+07 |
| Cs-138 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cs-139 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-139 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-140 | 2.88e+07 | 3.61e+04 | 1.88e+06 | 0.00e+00 | 1.23e+04 | 2.07e+04 | 5.92e+07 |
| Ba-141 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-142 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| La-140 | 3.75e-02 | 1.89e-02 | 4.99e-03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.39e+03 |
| La-141 | 3.46e-37 | 1.07e-37 | 1.76e-38 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.28e-32 |
| La-142 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ce-141 | 1.41e+04 | 9.50e+03 | 1.08e+03 | 0.00e+00 | 4.41e+03 | 0.00e+00 | 3.63e+07 |
| Ce-143 | 2.03e-02 | 1.50e+01 | 1.66e-03 | 0.00e+00 | 6.61e-03 | 0.00e+00 | 5.61e+02 |
| Ce-144 | 1.46e+06 | 6.09e+05 | 7.83e+04 | 0.00e+00 | 3.61e+05 | 0.00e+00 | 4.93e+08 |
| Pr-143 | 2.10e+04 | 8.42e+03 | 1.04e+03 | 0.00e+00 | 4.86e+03 | 0.00e+00 | 9.19e+07 |
| Pr-144 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Nd-147 | 7.08e+03 | 8.18e+03 | 4.90e+02 | 0.00e+00 | 4.78e+03 | 0.00e+00 | 3.93e+07 |
| Pm-147 | 9.64e+05 | 9.07e+04 | 3.67e+04 | 0.00e+00 | 1.71e+05 | 0.00e+00 | 1.14e+08 |
| Pm-148 | 1.98e+03 | 3.29e+02 | 1.65e+02 | 0.00e+00 | 6.21e+02 | 0.00e+00 | 2.58e+07 |
| Pm-148m | 2.16e+05 | 5.59e+04 | 4.27e+04 | 0.00e+00 | 8.43e+04 | 0.00e+00 | 4.74e+08 |
| Pm-149 | 5.15e+00 | 7.28e-01 | 2.97e-01 | 0.00e+00 | 1.37e+00 | 0.00e+00 | 1.36e+05 |
| Pm-151 | 5.64e-03 | 9.46e-04 | 4.78e-04 | 0.00e+00 | 1.69e-03 | 0.00e+00 | 2.60e+02 |
| Sm-151 | 9.45e+05 | 1.63e+05 | 3.90e+04 | 0.00e+00 | 1.82e+05 | 0.00e+00 | 7.19e+07 |
| Sm-153 | 1.17e+00 | 9.80e-01 | 7.15e-02 | 0.00e+00 | 3.17e-01 | 0.00e+00 | 3.49e+04 |
| Eu-152 | 2.55e+06 | 5.81e+05 | 5.10e+05 | 0.00e+00 | 3.60e+06 | 0.00e+00 | 3.35e+08 |
| Eu-154 | 8.09e+06 | 9.95e+05 | 7.08e+05 | 0.00e+00 | 4.76e+06 | 0.00e+00 | 7.21e+08 |
| Eu-155 | 1.09e+06 | 1.54e+05 | 9.93e+04 | 0.00e+00 | 7.10e+05 | 0.00e+00 | 1.21e+08 |
| Eu-156 | 3.77e+04 | 2.92e+04 | 4.71e+03 | 0.00e+00 | 1.95e+04 | 0.00e+00 | 2.00e+08 |
| Tb-160 | 3.92e+05 | 0.00e+00 | 4.89e+04 | 0.00e+00 | 1.62e+05 | 0.00e+00 | 3.61e+08 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# MEAT PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Meat & Poultry Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ho-166m | 3.26e+06 | 1.02e+06 | 7.72e+05 | 0.00e+00 | 1.52e+06 | 0.00e+00 | 3.09e+08 |
| W-181 | 3.02e+04 | 9.84e+03 | 1.05e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.12e+06 |
| W-185 | 1.08e+06 | 3.61e+05 | 3.79e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.17e+07 |
| W-187 | 2.25e-02 | 1.88e-02 | 6.56e-03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.15e+00 |
| Pb-210 | 1.21e+10 | 3.46e+09 | 4.31e+08 | 0.00e+00 | 9.75e+09 | 0.00e+00 | 1.77e+06 |
| Bi-210 | 2.72e+05 | 1.88e+06 | 1.56e+05 | 0.00e+00 | 2.26e+07 | 0.00e+00 | 2.80e+07 |
| Po-210 | 9.62e+09 | 2.04e+10 | 2.32e+09 | 0.00e+00 | 6.81e+10 | 0.00e+00 | 1.72e+09 |
| Ra-223 | 6.16e+10 | 9.49e+07 | 1.23e+10 | 0.00e+00 | 2.69e+09 | 0.00e+00 | 3.98e+09 |
| Ra-224 | 7.05e+08 | 1.71e+06 | 1.41e+08 | 0.00e+00 | 4.81e+07 | 0.00e+00 | 1.49e+08 |
| Ra-225 | 1.23e+11 | 1.46e+08 | 2.46e+10 | 0.00e+00 | 4.15e+09 | 0.00e+00 | 5.75e+09 |
| Ra-226 | 2.82e+13 | 5.35e+08 | 2.05e+13 | 0.00e+00 | 1.52e+10 | 0.00e+00 | 3.10e+10 |
| Ra-228 | 1.03e+13 | 2.87e+08 | 1.11e+13 | 0.00e+00 | 8.12e+09 | 0.00e+00 | 5.19e+09 |
| Ac-225 | 7.54e+07 | 1.04e+08 | 5.07e+06 | 0.00e+00 | 1.18e+07 | 0.00e+00 | 6.98e+09 |
| Ac-227 | 3.07e+11 | 4.07e+10 | 1.82e+10 | 0.00e+00 | 1.31e+10 | 0.00e+00 | 1.34e+10 |
| Th-227 | 2.02e+06 | 3.66e+04 | 5.83e+04 | 0.00e+00 | 2.08e+05 | 0.00e+00 | 7.97e+07 |
| Th-228 | 2.61e+08 | 4.43e+06 | 8.85e+06 | 0.00e+00 | 2.46e+07 | 0.00e+00 | 2.97e+08 |
| Th-229 | 7.46e+09 | 2.13e+08 | 1.23e+08 | 0.00e+00 | 1.03e+09 | 0.00e+00 | 4.28e+07 |
| Th-230 | 1.13e+09 | 6.42e+07 | 3.13e+07 | 0.00e+00 | 3.10e+08 | 0.00e+00 | 3.30e+07 |
| Th-232 | 1.26e+09 | 5.48e+07 | 8.23e+05 | 0.00e+00 | 2.64e+08 | 0.00e+00 | 2.81e+07 |
| Th-234 | 1.56e+04 | 9.19e+02 | 4.51e+02 | 0.00e+00 | 5.21e+03 | 0.00e+00 | 2.21e+07 |
| Pa-231 | 8.99e+15 | 3.38e+14 | 3.49e+14 | 0.00e+00 | 1.90e+15 | 0.00e+00 | 1.57e+14 |
| Pa-233 | 4.60e+09 | 9.28e+08 | 7.98e+08 | 0.00e+00 | 3.49e+09 | 0.00e+00 | 1.44e+13 |
| U-232 | 3.85e+09 | 0.00e+00 | 2.75e+08 | 0.00e+00 | 4.16e+08 | 0.00e+00 | 6.31e+07 |
| U-233 | 8.12e+08 | 0.00e+00 | 4.92e+07 | 0.00e+00 | 1.89e+08 | 0.00e+00 | 5.85e+07 |
| U-234 | 7.79e+08 | 0.00e+00 | 4.82e+07 | 0.00e+00 | 1.86e+08 | 0.00e+00 | 5.72e+07 |
| U-235 | 7.47e+08 | 0.00e+00 | 4.53e+07 | 0.00e+00 | 1.74e+08 | 0.00e+00 | 7.28e+07 |
| U-236 | 7.47e+08 | 0.00e+00 | 4.62e+07 | 0.00e+00 | 1.78e+08 | 0.00e+00 | 5.37e+07 |
| U-237 | 2.15e+03 | 0.00e+00 | 5.72e+02 | 0.00e+00 | 8.83e+03 | 0.00e+00 | 7.55e+05 |
| U-238 | 7.15e+08 | 0.00e+00 | 4.23e+07 | 0.00e+00 | 1.63e+08 | 0.00e+00 | 5.13e+07 |
| Np-237 | 6.91e+08 | 4.91e+07 | 3.04e+07 | 0.00e+00 | 2.26e+08 | 0.00e+00 | 4.35e+07 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# MEAT PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Meat & Poultry Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Np-238 | 1.43e+00 | 3.85e-02 | 2.22e-02 | 0.00e+00 | 1.30e-01 | 0.00e+00 | 3.58e+03 |
| Np-239 | 2.61e-01 | 2.57e-02 | 1.41e-02 | 0.00e+00 | 8.00e-02 | 0.00e+00 | 5.26e+03 |
| Pu-238 | 2.42e+07 | 3.06e+06 | 6.56e+05 | 0.00e+00 | 2.81e+06 | 0.00e+00 | 2.80e+06 |
| Pu-239 | 2.78e+07 | 3.34e+06 | 7.33e+05 | 0.00e+00 | 3.11e+06 | 0.00e+00 | 2.56e+06 |
| Pu-240 | 2.78e+07 | 3.34e+06 | 7.33e+05 | 0.00e+00 | 3.11e+06 | 0.00e+00 | 2.60e+06 |
| Pu-241 | 6.00e+05 | 2.85e+04 | 1.27e+04 | 0.00e+00 | 5.84e+04 | 0.00e+00 | 5.35e+04 |
| Pu-242 | 2.58e+07 | 3.22e+06 | 7.06e+05 | 0.00e+00 | 3.00e+06 | 0.00e+00 | 2.51e+06 |
| Pu-244 | 3.01e+07 | 3.69e+06 | 8.10e+05 | 0.00e+00 | 3.44e+06 | 0.00e+00 | 3.74e+06 |
| Am-241 | 4.07e+08 | 3.80e+08 | 2.92e+07 | 0.00e+00 | 2.19e+08 | 0.00e+00 | 4.00e+07 |
| Am-242m | 4.17e+08 | 3.63e+08 | 2.98e+07 | 0.00e+00 | 2.22e+08 | 0.00e+00 | 5.12e+07 |
| Am-243 | 4.14e+08 | 3.78e+08 | 2.91e+07 | 0.00e+00 | 2.19e+08 | 0.00e+00 | 4.77e+07 |
| Cm-242 | 9.56e+06 | 1.02e+07 | 6.36e+05 | 0.00e+00 | 2.89e+06 | 0.00e+00 | 3.67e+07 |
| Cm-243 | 3.28e+08 | 3.00e+08 | 2.05e+07 | 0.00e+00 | 9.57e+07 | 0.00e+00 | 4.27e+07 |
| Cm-244 | 2.49e+08 | 2.33e+08 | 1.57e+07 | 0.00e+00 | 7.32e+07 | 0.00e+00 | 4.12e+07 |
| Cm-245 | 5.14e+08 | 4.48e+08 | 3.16e+07 | 0.00e+00 | 1.48e+08 | 0.00e+00 | 3.86e+07 |
| Cm-246 | 5.10e+08 | 4.48e+08 | 3.15e+07 | 0.00e+00 | 1.47e+08 | 0.00e+00 | 3.79e+07 |
| Cm-247 | 4.97e+08 | 4.41e+08 | 3.11e+07 | 0.00e+00 | 1.45e+08 | 0.00e+00 | 4.99e+07 |
| Cm-248 | 4.14e+09 | 3.64e+09 | 2.56e+08 | 0.00e+00 | 1.20e+09 | 0.00e+00 | 8.06e+08 |
| Cf-252 | 1.39e+08 | 0.00e+00 | 3.34e+06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.53e+08 |

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# MEAT PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Meat & Poultry Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| H-3 | 0.00e+00 | 1.10e+02 | 1.10e+02 | 1.10e+02 | 1.10e+02 | 1.10e+02 | 1.10e+02 |
| Be-10 | 7.26e+06 | 1.12e+06 | 1.83e+05 | 0.00e+00 | 8.59e+05 | 0.00e+00 | 4.60e+07 |
| C-14 | 2.04e+08 | 4.08e+07 | 4.08e+07 | 4.08e+07 | 4.08e+07 | 4.08e+07 | 4.08e+07 |
| N-13 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| F-18 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Na-22 | 1.10e+09 | 1.10e+09 | 1.10e+09 | 1.10e+09 | 1.10e+09 | 1.10e+09 | 1.10e+09 |
| Na-24 | 1.11e-03 | 1.11e-03 | 1.11e-03 | 1.11e-03 | 1.11e-03 | 1.11e-03 | 1.11e-03 |
| P-32 | 3.94e+09 | 2.44e+08 | 1.53e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.31e+08 |
| Ca-41 | 1.28e+09 | 0.00e+00 | 1.38e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.26e+06 |
| Sc-46 | 1.36e+05 | 2.65e+05 | 7.87e+04 | 0.00e+00 | 2.54e+05 | 0.00e+00 | 9.04e+08 |
| Cr-51 | 0.00e+00 | 0.00e+00 | 5.64e+03 | 3.13e+03 | 1.24e+03 | 8.05e+03 | 9.48e+05 |
| Mn-54 | 0.00e+00 | 7.00e+06 | 1.39e+06 | 0.00e+00 | 2.09e+06 | 0.00e+00 | 1.44e+07 |
| Mn-56 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Fe-55 | 2.38e+08 | 1.69e+08 | 3.94e+07 | 0.00e+00 | 0.00e+00 | 1.07e+08 | 7.31e+07 |
| Fe-59 | 2.12e+08 | 4.95e+08 | 1.91e+08 | 0.00e+00 | 0.00e+00 | 1.56e+08 | 1.17e+09 |
| Co-57 | 0.00e+00 | 4.53e+06 | 7.59e+06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 8.45e+07 |
| Co-58 | 0.00e+00 | 1.41e+07 | 3.24e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.94e+08 |
| Co-60 | 0.00e+00 | 5.83e+07 | 1.31e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.60e+08 |
| Ni-59 | 1.13e+08 | 4.00e+07 | 1.92e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.28e+06 |
| Ni-63 | 1.52e+09 | 1.07e+08 | 5.15e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.71e+07 |
| Ni-65 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cu-64 | 0.00e+00 | 2.28e-07 | 1.07e-07 | 0.00e+00 | 5.77e-07 | 0.00e+00 | 1.77e-05 |
| Zn-65 | 2.50e+08 | 8.69e+08 | 4.05e+08 | 0.00e+00 | 5.56e+08 | 0.00e+00 | 3.68e+08 |
| Zn-69 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Zn-69m | 1.56e-05 | 3.67e-05 | 3.37e-06 | 0.00e+00 | 2.23e-05 | 0.00e+00 | 2.02e-03 |
| Se-79 | 0.00e+00 | 9.07e+07 | 1.52e+07 | 0.00e+00 | 1.58e+08 | 0.00e+00 | 1.39e+07 |
| Br-82 | 0.00e+00 | 0.00e+00 | 9.76e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-83 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-84 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-85 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

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# MEAT PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Meat & Poultry Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Rb-86 | 0.00e+00 | 4.07e+08 | 1.91e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.02e+07 |
| Rb-87 | 0.00e+00 | 8.79e+08 | 3.07e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.07e+07 |
| Rb-88 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Rb-89 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sr-89 | 2.55e+08 | 0.00e+00 | 7.29e+06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.03e+07 |
| Sr-90 | 9.89e+09 | 0.00e+00 | 1.98e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.26e+08 |
| Sr-91 | 1.33e-10 | 0.00e+00 | 5.29e-12 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.03e-10 |
| Sr-92 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Y-90 | 9.11e+01 | 0.00e+00 | 2.45e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.52e+05 |
| Y-91 | 9.54e+05 | 0.00e+00 | 2.56e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.91e+08 |
| Y-91m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Y-92 | 1.43e-39 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.93e-35 |
| Y-93 | 4.11e-12 | 0.00e+00 | 1.13e-13 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.26e-07 |
| Zr-93 | 3.05e+06 | 1.50e+05 | 8.21e+04 | 0.00e+00 | 5.32e+05 | 0.00e+00 | 1.42e+08 |
| Zr-95 | 1.50e+06 | 4.73e+05 | 3.25e+05 | 0.00e+00 | 6.95e+05 | 0.00e+00 | 1.09e+09 |
| Zr-97 | 1.76e-05 | 3.49e-06 | 1.61e-06 | 0.00e+00 | 5.29e-06 | 0.00e+00 | 9.44e-01 |
| Nb-93m | 1.55e+07 | 5.10e+06 | 1.28e+06 | 0.00e+00 | 5.96e+06 | 0.00e+00 | 1.84e+09 |
| Nb-95 | 1.79e+06 | 9.96e+05 | 5.48e+05 | 0.00e+00 | 9.65e+05 | 0.00e+00 | 4.26e+09 |
| Nb-97 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Mo-93 | 0.00e+00 | 1.37e+08 | 3.76e+06 | 0.00e+00 | 3.94e+07 | 0.00e+00 | 1.67e+07 |
| Mo-99 | 0.00e+00 | 8.31e+04 | 1.59e+04 | 0.00e+00 | 1.90e+05 | 0.00e+00 | 1.49e+05 |
| Tc-101 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Tc-99 | 1.16e+08 | 1.70e+08 | 4.65e+07 | 0.00e+00 | 2.16e+09 | 1.76e+07 | 4.17e+09 |
| Tc-99m | 3.77e-21 | 1.05e-20 | 1.36e-19 | 0.00e+00 | 1.57e-19 | 5.83e-21 | 6.90e-18 |
| Ru-103 | 8.57e+07 | 0.00e+00 | 3.66e+07 | 0.00e+00 | 3.02e+08 | 0.00e+00 | 7.16e+09 |
| Ru-105 | 5.27e-28 | 0.00e+00 | 2.04e-28 | 0.00e+00 | 6.65e-27 | 0.00e+00 | 4.25e-25 |
| Ru-106 | 2.36e+09 | 0.00e+00 | 2.97e+08 | 0.00e+00 | 4.55e+09 | 0.00e+00 | 1.13e+11 |
| Rh-105 | 3.21e+00 | 2.32e+00 | 1.52e+00 | 0.00e+00 | 9.84e+00 | 0.00e+00 | 2.95e+02 |
| Pd-107 | 0.00e+00 | 1.35e+06 | 8.69e+04 | 0.00e+00 | 1.22e+07 | 0.00e+00 | 6.26e+06 |
| Pd-109 | 0.00e+00 | 1.24e-06 | 2.83e-07 | 0.00e+00 | 7.19e-06 | 0.00e+00 | 1.25e-04 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# MEAT PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Meat & Poultry Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ag-110m | 5.06e+06 | 4.79e+06 | 2.91e+06 | 0.00e+00 | 9.13e+06 | 0.00e+00 | 1.34e+09 |
| Ag-111 | 1.23e+05 | 5.12e+04 | 2.57e+04 | 0.00e+00 | 1.67e+05 | 0.00e+00 | 7.14e+07 |
| Cd-113m | 0.00e+00 | 3.85e+06 | 1.24e+05 | 0.00e+00 | 4.26e+06 | 0.00e+00 | 2.32e+07 |
| Cd-115m | 0.00e+00 | 1.25e+06 | 4.02e+04 | 0.00e+00 | 9.96e+05 | 0.00e+00 | 3.94e+07 |
| Sn-123 | 4.66e+09 | 7.66e+07 | 1.13e+08 | 6.13e+07 | 0.00e+00 | 0.00e+00 | 7.05e+09 |
| Sn-125 | 1.49e+08 | 2.96e+06 | 6.71e+06 | 2.32e+06 | 0.00e+00 | 0.00e+00 | 1.40e+09 |
| Sn-126 | 1.50e+10 | 2.80e+08 | 4.28e+08 | 7.38e+07 | 0.00e+00 | 0.00e+00 | 3.34e+09 |
| Sb-124 | 1.62e+07 | 2.98e+05 | 6.31e+06 | 3.67e+04 | 0.00e+00 | 1.41e+07 | 3.26e+08 |
| Sb-125 | 1.56e+07 | 1.71e+05 | 3.66e+06 | 1.49e+04 | 0.00e+00 | 1.37e+07 | 1.22e+08 |
| Sb-126 | 1.60e+06 | 3.28e+04 | 5.76e+05 | 9.07e+03 | 0.00e+00 | 1.15e+06 | 9.49e+07 |
| Sb-127 | 1.43e+04 | 3.05e+02 | 5.38e+03 | 1.60e+02 | 0.00e+00 | 9.70e+03 | 2.42e+06 |
| Te-125m | 3.03e+08 | 1.09e+08 | 4.05e+07 | 8.47e+07 | 0.00e+00 | 0.00e+00 | 8.94e+08 |
| Te-127 | 1.88e-10 | 6.65e-11 | 4.04e-11 | 1.29e-10 | 7.60e-10 | 0.00e+00 | 1.45e-08 |
| Te-127m | 9.42e+08 | 3.34e+08 | 1.12e+08 | 2.24e+08 | 3.82e+09 | 0.00e+00 | 2.35e+09 |
| Te-129 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Te-129m | 9.50e+08 | 3.53e+08 | 1.50e+08 | 3.07e+08 | 3.98e+09 | 0.00e+00 | 3.57e+09 |
| Te-131 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Te-131m | 3.81e+02 | 1.83e+02 | 1.52e+02 | 2.75e+02 | 1.90e+03 | 0.00e+00 | 1.47e+04 |
| Te-132 | 1.17e+06 | 7.39e+05 | 6.96e+05 | 7.79e+05 | 7.09e+06 | 0.00e+00 | 2.34e+07 |
| Te-133m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Te-134 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| I-129 | 1.09e+08 | 9.21e+07 | 1.54e+08 | 1.12e+11 | 1.65e+08 | 0.00e+00 | 1.07e+07 |
| I-130 | 1.75e-06 | 5.07e-06 | 2.02e-06 | 4.13e-04 | 7.80e-06 | 0.00e+00 | 3.89e-06 |
| I-131 | 8.94e+06 | 1.25e+07 | 6.72e+06 | 3.65e+09 | 2.15e+07 | 0.00e+00 | 2.48e+06 |
| I-132 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| I-133 | 3.11e-01 | 5.28e-01 | 1.61e-01 | 7.37e+01 | 9.26e-01 | 0.00e+00 | 3.99e-01 |
| I-134 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| I-135 | 3.82e-17 | 9.82e-17 | 3.64e-17 | 6.32e-15 | 1.55e-16 | 0.00e+00 | 1.09e-16 |
| Cs-134 | 5.23e+08 | 1.23e+09 | 5.71e+08 | 0.00e+00 | 3.91e+08 | 1.49e+08 | 1.53e+07 |
| Cs-134m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# MEAT PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Meat & Poultry Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Cs-135 | 1.80e+08 | 1.65e+08 | 3.86e+07 | 0.00e+00 | 6.31e+07 | 2.28e+07 | 2.89e+06 |
| Cs-136 | 9.41e+06 | 3.70e+07 | 2.49e+07 | 0.00e+00 | 2.02e+07 | 3.18e+06 | 2.98e+06 |
| Cs-137 | 7.24e+08 | 9.63e+08 | 3.36e+08 | 0.00e+00 | 3.28e+08 | 1.27e+08 | 1.37e+07 |
| Cs-138 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cs-139 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-139 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-140 | 2.38e+07 | 2.91e+04 | 1.53e+06 | 0.00e+00 | 9.88e+03 | 1.96e+04 | 3.67e+07 |
| Ba-141 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-142 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| La-140 | 3.08e-02 | 1.51e-02 | 4.03e-03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 8.69e+02 |
| La-141 | 2.92e-37 | 8.97e-38 | 1.48e-38 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.59e-32 |
| La-142 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ce-141 | 1.18e+04 | 7.88e+03 | 9.05e+02 | 0.00e+00 | 3.71e+03 | 0.00e+00 | 2.25e+07 |
| Ce-143 | 1.71e-02 | 1.24e+01 | 1.39e-03 | 0.00e+00 | 5.58e-03 | 0.00e+00 | 3.74e+02 |
| Ce-144 | 1.23e+06 | 5.08e+05 | 6.60e+04 | 0.00e+00 | 3.04e+05 | 0.00e+00 | 3.09e+08 |
| Pr-143 | 1.77e+04 | 7.05e+03 | 8.79e+02 | 0.00e+00 | 4.10e+03 | 0.00e+00 | 5.81e+07 |
| Pr-144 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Nd-147 | 6.24e+03 | 6.78e+03 | 4.06e+02 | 0.00e+00 | 3.98e+03 | 0.00e+00 | 2.45e+07 |
| Pm-147 | 7.93e+05 | 7.53e+04 | 3.07e+04 | 0.00e+00 | 1.44e+05 | 0.00e+00 | 7.16e+07 |
| Pm-148 | 1.66e+03 | 2.71e+02 | 1.36e+02 | 0.00e+00 | 4.89e+02 | 0.00e+00 | 1.62e+07 |
| Pm-148m | 1.72e+05 | 4.36e+04 | 3.41e+04 | 0.00e+00 | 6.60e+04 | 0.00e+00 | 2.74e+08 |
| Pm-149 | 4.34e+00 | 6.10e-01 | 2.50e-01 | 0.00e+00 | 1.16e+00 | 0.00e+00 | 8.98e+04 |
| Pm-151 | 4.72e-03 | 7.79e-04 | 3.94e-04 | 0.00e+00 | 1.40e-03 | 0.00e+00 | 1.75e+02 |
| Sm-151 | 7.07e+05 | 1.36e+05 | 3.19e+04 | 0.00e+00 | 1.49e+05 | 0.00e+00 | 4.61e+07 |
| Sm-153 | 9.88e-01 | 8.18e-01 | 6.02e-02 | 0.00e+00 | 2.67e-01 | 0.00e+00 | 2.31e+04 |
| Eu-152 | 1.89e+06 | 4.56e+05 | 4.02e+05 | 0.00e+00 | 2.12e+06 | 0.00e+00 | 1.68e+08 |
| Eu-154 | 6.15e+06 | 7.93e+05 | 5.59e+05 | 0.00e+00 | 3.55e+06 | 0.00e+00 | 4.19e+08 |
| Eu-155 | 1.30e+06 | 1.25e+05 | 7.76e+04 | 0.00e+00 | 4.90e+05 | 0.00e+00 | 7.18e+08 |
| Eu-156 | 3.12e+04 | 2.34e+04 | 3.82e+03 | 0.00e+00 | 1.58e+04 | 0.00e+00 | 1.20e+08 |
| Tb-160 | 3.19e+05 | 0.00e+00 | 3.98e+04 | 0.00e+00 | 1.26e+05 | 0.00e+00 | 2.06e+08 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# MEAT PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Meat & Poultry Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ho-166m | 2.55e+06 | 7.84e+05 | 5.68e+05 | 0.00e+00 | 1.15e+06 | 0.00e+00 | 1.93e+08 |
| W-181 | 2.56e+04 | 8.25e+03 | 8.62e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.02e+05 |
| W-185 | 9.14e+05 | 3.01e+05 | 3.19e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.60e+07 |
| W-187 | 1.88e-02 | 1.53e-02 | 5.37e-03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.15e+00 |
| Pb-210 | 8.47e+09 | 2.55e+09 | 3.28e+08 | 0.00e+00 | 8.05e+09 | 0.00e+00 | 1.11e+06 |
| Bi-210 | 2.30e+05 | 1.57e+06 | 1.32e+05 | 0.00e+00 | 1.91e+07 | 0.00e+00 | 1.80e+07 |
| Po-210 | 8.13e+09 | 1.71e+10 | 1.96e+09 | 0.00e+00 | 5.75e+10 | 0.00e+00 | 1.08e+09 |
| Ra-223 | 5.21e+10 | 7.92e+07 | 1.04e+10 | 0.00e+00 | 2.27e+09 | 0.00e+00 | 2.51e+09 |
| Ra-224 | 5.97e+08 | 1.43e+06 | 1.19e+08 | 0.00e+00 | 4.09e+07 | 0.00e+00 | 9.59e+07 |
| Ra-225 | 1.04e+11 | 1.22e+08 | 2.08e+10 | 0.00e+00 | 3.50e+09 | 0.00e+00 | 3.63e+09 |
| Ra-226 | 1.77e+13 | 4.48e+08 | 1.32e+13 | 0.00e+00 | 1.28e+10 | 0.00e+00 | 1.93e+10 |
| Ra-228 | 7.45e+12 | 2.40e+08 | 8.21e+12 | 0.00e+00 | 6.85e+09 | 0.00e+00 | 3.25e+09 |
| Ac-225 | 6.37e+07 | 8.70e+07 | 4.27e+06 | 0.00e+00 | 9.98e+06 | 0.00e+00 | 4.42e+09 |
| Ac-227 | 1.99e+11 | 2.94e+10 | 1.18e+10 | 0.00e+00 | 8.54e+09 | 0.00e+00 | 8.41e+09 |
| Th-227 | 1.71e+06 | 3.07e+04 | 4.93e+04 | 0.00e+00 | 1.75e+05 | 0.00e+00 | 5.01e+07 |
| Th-228 | 2.12e+08 | 3.55e+06 | 7.16e+06 | 0.00e+00 | 2.00e+07 | 0.00e+00 | 1.86e+08 |
| Th-229 | 4.63e+09 | 1.33e+08 | 7.68e+07 | 0.00e+00 | 6.45e+08 | 0.00e+00 | 2.68e+07 |
| Th-230 | 7.00e+08 | 3.99e+07 | 1.94e+07 | 0.00e+00 | 1.94e+08 | 0.00e+00 | 2.07e+07 |
| Th-232 | 7.84e+08 | 3.40e+07 | 5.28e+05 | 0.00e+00 | 1.66e+08 | 0.00e+00 | 1.76e+07 |
| Th-234 | 1.31e+04 | 7.70e+02 | 3.82e+02 | 0.00e+00 | 4.39e+03 | 0.00e+00 | 1.40e+07 |
| Pa-231 | 5.59e+15 | 2.10e+14 | 2.18e+14 | 0.00e+00 | 1.18e+15 | 0.00e+00 | 9.85e+13 |
| Pa-233 | 3.79e+09 | 7.29e+08 | 6.52e+08 | 0.00e+00 | 2.75e+09 | 0.00e+00 | 8.33e+12 |
| U-232 | 3.24e+09 | 0.00e+00 | 2.32e+08 | 0.00e+00 | 3.51e+08 | 0.00e+00 | 3.96e+07 |
| U-233 | 6.83e+08 | 0.00e+00 | 4.15e+07 | 0.00e+00 | 1.60e+08 | 0.00e+00 | 3.66e+07 |
| U-234 | 6.56e+08 | 0.00e+00 | 4.07e+07 | 0.00e+00 | 1.57e+08 | 0.00e+00 | 3.59e+07 |
| U-235 | 6.28e+08 | 0.00e+00 | 3.82e+07 | 0.00e+00 | 1.47e+08 | 0.00e+00 | 4.56e+07 |
| U-236 | 6.28e+08 | 0.00e+00 | 3.91e+07 | 0.00e+00 | 1.50e+08 | 0.00e+00 | 3.37e+07 |
| U-237 | 1.81e+03 | 0.00e+00 | 4.83e+02 | 0.00e+00 | 7.45e+03 | 0.00e+00 | 4.80e+05 |
| U-238 | 6.01e+08 | 0.00e+00 | 3.58e+07 | 0.00e+00 | 1.38e+08 | 0.00e+00 | 3.21e+07 |
| Np-237 | 4.31e+08 | 3.10e+07 | 1.90e+07 | 0.00e+00 | 1.40e+08 | 0.00e+00 | 2.73e+07 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# MEAT PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Meat & Poultry Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Np-238 | 1.20e+00 | 3.22e-02 | 1.87e-02 | 0.00e+00 | 1.10e-01 | 0.00e+00 | 2.36e+03 |
| Np-239 | 2.28e-01 | 2.15e-02 | 1.19e-02 | 0.00e+00 | 6.75e-02 | 0.00e+00 | 3.46e+03 |
| Pu-238 | 1.52e+07 | 1.94e+06 | 4.13e+05 | 0.00e+00 | 1.77e+06 | 0.00e+00 | 1.75e+06 |
| Pu-239 | 1.74e+07 | 2.11e+06 | 4.56e+05 | 0.00e+00 | 1.94e+06 | 0.00e+00 | 1.60e+06 |
| Pu-240 | 1.73e+07 | 2.10e+06 | 4.56e+05 | 0.00e+00 | 1.94e+06 | 0.00e+00 | 1.63e+06 |
| Pu-241 | 3.95e+05 | 1.90e+04 | 8.33e+03 | 0.00e+00 | 3.86e+04 | 0.00e+00 | 3.34e+04 |
| Pu-242 | 1.61e+07 | 2.03e+06 | 4.40e+05 | 0.00e+00 | 1.87e+06 | 0.00e+00 | 1.57e+06 |
| Pu-244 | 1.88e+07 | 2.31e+06 | 5.04e+05 | 0.00e+00 | 2.14e+06 | 0.00e+00 | 2.34e+06 |
| Am-241 | 2.54e+08 | 2.40e+08 | 1.83e+07 | 0.00e+00 | 1.37e+08 | 0.00e+00 | 2.51e+07 |
| Am-242m | 2.61e+08 | 2.30e+08 | 1.88e+07 | 0.00e+00 | 1.39e+08 | 0.00e+00 | 3.21e+07 |
| Am-243 | 2.58e+08 | 2.38e+08 | 1.82e+07 | 0.00e+00 | 1.37e+08 | 0.00e+00 | 2.99e+07 |
| Cm-242 | 8.06e+06 | 8.50e+06 | 5.35e+05 | 0.00e+00 | 2.44e+06 | 0.00e+00 | 2.30e+07 |
| Cm-243 | 2.10e+08 | 1.95e+08 | 1.32e+07 | 0.00e+00 | 6.17e+07 | 0.00e+00 | 2.68e+07 |
| Cm-244 | 1.63e+08 | 1.54e+08 | 1.03e+07 | 0.00e+00 | 4.81e+07 | 0.00e+00 | 2.58e+07 |
| Cm-245 | 3.21e+08 | 2.82e+08 | 1.98e+07 | 0.00e+00 | 9.24e+07 | 0.00e+00 | 2.42e+07 |
| Cm-246 | 3.18e+08 | 2.82e+08 | 1.97e+07 | 0.00e+00 | 9.20e+07 | 0.00e+00 | 2.38e+07 |
| Cm-247 | 3.10e+08 | 2.78e+08 | 1.94e+07 | 0.00e+00 | 9.07e+07 | 0.00e+00 | 3.12e+07 |
| Cm-248 | 2.58e+09 | 2.29e+09 | 1.60e+08 | 0.00e+00 | 7.49e+08 | 0.00e+00 | 5.02e+08 |
| Cf-252 | 1.09e+08 | 0.00e+00 | 2.63e+06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 9.58e+07 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# MEAT PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Meat & Poultry Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| H-3 | 0.00e+00 | 1.34e+02 | 1.34e+02 | 1.34e+02 | 1.34e+02 | 1.34e+02 | 1.34e+02 |
| Be-10 | 1.38e+07 | 1.60e+06 | 3.46e+05 | 0.00e+00 | 1.13e+06 | 0.00e+00 | 2.81e+07 |
| C-14 | 3.83e+08 | 7.67e+07 | 7.67e+07 | 7.67e+07 | 7.67e+07 | 7.67e+07 | 7.67e+07 |
| N-13 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| F-18 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Na-22 | 1.75e+09 | 1.75e+09 | 1.75e+09 | 1.75e+09 | 1.75e+09 | 1.75e+09 | 1.75e+09 |
| Na-24 | 1.77e-03 | 1.77e-03 | 1.77e-03 | 1.77e-03 | 1.77e-03 | 1.77e-03 | 1.77e-03 |
| P-32 | 7.43e+09 | 3.47e+08 | 2.86e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.05e+08 |
| Ca-41 | 1.42e+09 | 0.00e+00 | 1.55e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.77e+05 |
| Sc-46 | 2.34e+05 | 3.21e+05 | 1.24e+05 | 0.00e+00 | 2.84e+05 | 0.00e+00 | 4.69e+08 |
| Cr-51 | 0.00e+00 | 0.00e+00 | 8.79e+03 | 4.88e+03 | 1.33e+03 | 8.91e+03 | 4.66e+05 |
| Mn-54 | 0.00e+00 | 8.01e+06 | 2.13e+06 | 0.00e+00 | 2.25e+06 | 0.00e+00 | 6.72e+06 |
| Mn-56 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Fe-55 | 4.57e+08 | 2.42e+08 | 7.51e+07 | 0.00e+00 | 0.00e+00 | 1.37e+08 | 4.49e+07 |
| Fe-59 | 3.76e+08 | 6.09e+08 | 3.03e+08 | 0.00e+00 | 0.00e+00 | 1.77e+08 | 6.34e+08 |
| Co-57 | 0.00e+00 | 5.92e+06 | 1.20e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.85e+07 |
| Co-58 | 0.00e+00 | 1.64e+07 | 5.03e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 9.58e+07 |
| Co-60 | 0.00e+00 | 6.93e+07 | 2.04e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.84e+08 |
| Ni-59 | 2.18e+08 | 5.80e+07 | 3.69e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.85e+06 |
| Ni-63 | 2.91e+09 | 1.56e+08 | 9.91e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.05e+07 |
| Ni-65 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cu-64 | 0.00e+00 | 3.07e-07 | 1.85e-07 | 0.00e+00 | 7.41e-07 | 0.00e+00 | 1.44e-05 |
| Zn-65 | 3.75e+08 | 1.00e+09 | 6.22e+08 | 0.00e+00 | 6.30e+08 | 0.00e+00 | 1.76e+08 |
| Zn-69 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Zn-69m | 2.91e-05 | 4.95e-05 | 5.85e-06 | 0.00e+00 | 2.88e-05 | 0.00e+00 | 1.61e-03 |
| Se-79 | 0.00e+00 | 1.29e+08 | 2.87e+07 | 0.00e+00 | 2.10e+08 | 0.00e+00 | 8.48e+06 |
| Br-82 | 0.00e+00 | 0.00e+00 | 1.53e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-83 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-84 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-85 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

Ri factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Meat & Poultry Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Rb-86 | 0.00e+00 | 5.77e+08 | 3.55e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.71e+07 |
| Rb-87 | 0.00e+00 | 1.25e+09 | 5.80e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.88e+07 |
| Rb-88 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Rb-89 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sr-89 | 4.82e+08 | 0.00e+00 | 1.38e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.87e+07 |
| Sr-90 | 1.57e+10 | 0.00e+00 | 3.15e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.40e+08 |
| Sr-91 | 2.50e-10 | 0.00e+00 | 9.42e-12 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.51e-10 |
| Sr-92 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Y-90 | 1.72e+02 | 0.00e+00 | 4.61e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.91e+05 |
| Y-91 | 1.80e+06 | 0.00e+00 | 4.82e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.40e+08 |
| Y-91m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Y-92 | 2.69e-39 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.76e-35 |
| Y-93 | 7.73e-12 | 0.00e+00 | 2.12e-13 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.15e-07 |
| Zr-93 | 5.80e+06 | 2.17e+05 | 1.55e+05 | 0.00e+00 | 8.41e+05 | 0.00e+00 | 8.24e+07 |
| Zr-95 | 2.66e+06 | 5.86e+05 | 5.21e+05 | 0.00e+00 | 8.38e+05 | 0.00e+00 | 6.11e+08 |
| Zr-97 | 3.28e-05 | 4.74e-06 | 2.80e-06 | 0.00e+00 | 6.80e-06 | 0.00e+00 | 7.18e-01 |
| Nb-93m | 2.99e+07 | 7.46e+06 | 2.45e+06 | 0.00e+00 | 8.05e+06 | 0.00e+00 | 1.12e+09 |
| Nb-95 | 3.10e+06 | 1.21e+06 | 8.62e+05 | 0.00e+00 | 1.13e+06 | 0.00e+00 | 2.23e+09 |
| Nb-97 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Mo-93 | 0.00e+00 | 1.97e+08 | 7.07e+06 | 0.00e+00 | 5.19e+07 | 0.00e+00 | 9.98e+06 |
| Mo-99 | 0.00e+00 | 1.16e+05 | 2.86e+04 | 0.00e+00 | 2.47e+05 | 0.00e+00 | 9.57e+04 |
| Tc-101 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Tc-99 | 2.19e+08 | 2.44e+08 | 8.75e+07 | 0.00e+00 | 2.87e+09 | 2.15e+07 | 2.56e+09 |
| Tc-99m | 6.61e-21 | 1.30e-20 | 2.15e-19 | 0.00e+00 | 1.88e-19 | 6.58e-21 | 7.37e-18 |
| Ru-103 | 1.55e+08 | 0.00e+00 | 5.96e+07 | 0.00e+00 | 3.90e+08 | 0.00e+00 | 4.01e+09 |
| Ru-105 | 9.83e-28 | 0.00e+00 | 3.57e-28 | 0.00e+00 | 8.64e-27 | 0.00e+00 | 6.42e-25 |
| Ru-106 | 4.44e+09 | 0.00e+00 | 5.54e+08 | 0.00e+00 | 5.99e+09 | 0.00e+00 | 6.90e+10 |
| Rh-105 | 6.01e+00 | 3.23e+00 | 2.76e+00 | 0.00e+00 | 1.29e+01 | 0.00e+00 | 2.00e+02 |
| Pd-107 | 0.00e+00 | 1.93e+06 | 1.64e+05 | 0.00e+00 | 1.61e+07 | 0.00e+00 | 3.83e+06 |
| Pd-109 | 0.00e+00 | 1.77e-06 | 5.32e-07 | 0.00e+00 | 9.51e-06 | 0.00e+00 | 1.05e-04 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# MEAT PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Meat & Poultry Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ag-110m | 8.39e+06 | 5.67e+06 | 4.53e+06 | 0.00e+00 | 1.06e+07 | 0.00e+00 | 6.74e+08 |
| Ag-111 | 2.33e+05 | 7.28e+04 | 4.81e+04 | 0.00e+00 | 2.20e+05 | 0.00e+00 | 4.46e+07 |
| Cd-113m | 0.00e+00 | 5.50e+06 | 2.34e+05 | 0.00e+00 | 5.66e+06 | 0.00e+00 | 1.42e+07 |
| Cd-115m | 0.00e+00 | 1.78e+06 | 7.58e+04 | 0.00e+00 | 1.32e+06 | 0.00e+00 | 2.42e+07 |
| Sn-123 | 8.81e+09 | 1.09e+08 | 2.15e+08 | 1.16e+08 | 0.00e+00 | 0.00e+00 | 4.32e+09 |
| Sn-125 | 2.80e+08 | 4.22e+06 | 1.25e+07 | 4.37e+06 | 0.00e+00 | 0.00e+00 | 8.67e+08 |
| Sn-126 | 2.72e+10 | 3.39e+08 | 7.74e+08 | 9.32e+07 | 0.00e+00 | 0.00e+00 | 2.04e+09 |
| Sb-124 | 2.92e+07 | 3.79e+05 | 1.02e+07 | 6.46e+04 | 0.00e+00 | 1.62e+07 | 1.83e+08 |
| Sb-125 | 2.85e+07 | 2.20e+05 | 5.97e+06 | 2.64e+04 | 0.00e+00 | 1.59e+07 | 6.80e+07 |
| Sb-126 | 2.80e+06 | 4.28e+04 | 1.01e+06 | 1.64e+04 | 0.00e+00 | 1.34e+06 | 5.64e+07 |
| Sb-127 | 2.63e+04 | 4.06e+02 | 9.11e+03 | 2.92e+02 | 0.00e+00 | 1.14e+04 | 1.48e+06 |
| Te-125m | 5.69e+08 | 1.54e+08 | 7.59e+07 | 1.60e+08 | 0.00e+00 | 0.00e+00 | 5.49e+08 |
| Te-127 | 3.53e-10 | 9.51e-11 | 7.57e-11 | 2.44e-10 | 1.00e-09 | 0.00e+00 | 1.38e-08 |
| Te-127m | 1.77e+09 | 4.78e+08 | 2.11e+08 | 4.24e+08 | 5.06e+09 | 0.00e+00 | 1.44e+09 |
| Te-129 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Te-129m | 1.79e+09 | 5.00e+08 | 2.78e+08 | 5.77e+08 | 5.26e+09 | 0.00e+00 | 2.18e+09 |
| Te-131 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Te-131m | 7.09e+02 | 2.45e+02 | 2.61e+02 | 5.04e+02 | 2.37e+03 | 0.00e+00 | 9.94e+03 |
| Te-132 | 2.13e+06 | 9.43e+05 | 1.14e+06 | 1.37e+06 | 8.76e+06 | 0.00e+00 | 9.49e+06 |
| Te-133m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Te-134 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| I-129 | 2.06e+08 | 1.26e+08 | 1.13e+08 | 8.27e+10 | 2.13e+08 | 0.00e+00 | 6.36e+06 |
| I-130 | 3.13e-06 | 6.33e-06 | 3.26e-06 | 6.97e-04 | 9.46e-06 | 0.00e+00 | 2.96e-06 |
| I-131 | 1.66e+07 | 1.67e+07 | 9.48e+06 | 5.51e+09 | 2.74e+07 | 0.00e+00 | 1.48e+06 |
| I-132 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| I-133 | 5.78e-01 | 7.15e-01 | 2.70e-01 | 1.33e+02 | 1.19e+00 | 0.00e+00 | 2.88e-01 |
| I-134 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| I-135 | 6.91e-17 | 1.24e-16 | 5.88e-17 | 1.10e-14 | 1.91e-16 | 0.00e+00 | 9.47e-17 |
| Cs-134 | 9.22e+08 | 1.51e+09 | 3.19e+08 | 0.00e+00 | 4.69e+08 | 1.68e+08 | 8.16e+06 |
| Cs-134m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# MEAT PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Meat & Poultry Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Cs-135 | 3.39e+08 | 2.36e+08 | 2.42e+07 | 0.00e+00 | 8.34e+07 | 2.78e+07 | 1.77e+06 |
| Cs-136 | 1.62e+07 | 4.46e+07 | 2.89e+07 | 0.00e+00 | 2.38e+07 | 3.54e+06 | 1.57e+06 |
| Cs-137 | 1.33e+09 | 1.28e+09 | 1.88e+08 | 0.00e+00 | 4.16e+08 | 1.50e+08 | 7.99e+06 |
| Cs-138 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cs-139 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-139 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-140 | 4.39e+07 | 3.85e+04 | 2.56e+06 | 0.00e+00 | 1.25e+04 | 2.29e+04 | 2.22e+07 |
| Ba-141 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-142 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| La-140 | 5.64e-02 | 1.97e-02 | 6.64e-03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.49e+02 |
| La-141 | 5.50e-37 | 1.28e-37 | 2.78e-38 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.85e-32 |
| La-142 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ce-141 | 2.22e+04 | 1.11e+04 | 1.65e+03 | 0.00e+00 | 4.86e+03 | 0.00e+00 | 1.38e+07 |
| Ce-143 | 3.21e-02 | 1.74e+01 | 2.52e-03 | 0.00e+00 | 7.29e-03 | 0.00e+00 | 2.55e+02 |
| Ce-144 | 2.32e+06 | 7.26e+05 | 1.24e+05 | 0.00e+00 | 4.02e+05 | 0.00e+00 | 1.89e+08 |
| Pr-143 | 3.34e+04 | 1.00e+04 | 1.66e+03 | 0.00e+00 | 5.43e+03 | 0.00e+00 | 3.61e+07 |
| Pr-144 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Nd-147 | 1.17e+04 | 9.48e+03 | 7.34e+02 | 0.00e+00 | 5.20e+03 | 0.00e+00 | 1.50e+07 |
| Pm-147 | 1.52e+06 | 1.08e+05 | 5.81e+04 | 0.00e+00 | 1.91e+05 | 0.00e+00 | 4.38e+07 |
| Pm-148 | 3.11e+03 | 3.74e+02 | 2.42e+02 | 0.00e+00 | 6.35e+02 | 0.00e+00 | 9.98e+06 |
| Pm-148m | 2.70e+05 | 5.37e+04 | 5.37e+04 | 0.00e+00 | 7.96e+04 | 0.00e+00 | 1.51e+08 |
| Pm-149 | 8.19e+00 | 8.71e-01 | 4.72e-01 | 0.00e+00 | 1.54e+00 | 0.00e+00 | 5.94e+04 |
| Pm-151 | 8.80e-03 | 1.07e-03 | 6.96e-04 | 0.00e+00 | 1.81e-03 | 0.00e+00 | 1.21e+02 |
| Sm-151 | 1.31e+06 | 1.95e+05 | 6.13e+04 | 0.00e+00 | 2.01e+05 | 0.00e+00 | 2.82e+07 |
| Sm-153 | 1.86e+00 | 1.16e+00 | 1.12e-01 | 0.00e+00 | 3.53e-01 | 0.00e+00 | 1.54e+04 |
| Eu-152 | 3.00e+06 | 5.46e+05 | 6.49e+05 | 0.00e+00 | 2.31e+06 | 0.00e+00 | 8.97e+07 |
| Eu-154 | 1.13e+07 | 1.02e+06 | 9.27e+05 | 0.00e+00 | 4.46e+06 | 0.00e+00 | 2.36e+08 |
| Eu-155 | 2.27e+06 | 1.63e+05 | 1.28e+05 | 0.00e+00 | 6.11e+05 | 0.00e+00 | 4.09e+08 |
| Eu-156 | 5.77e+04 | 3.09e+04 | 6.39e+03 | 0.00e+00 | 1.99e+04 | 0.00e+00 | 7.01e+07 |
| Tb-160 | 5.16e+05 | 0.00e+00 | 6.40e+04 | 0.00e+00 | 1.54e+05 | 0.00e+00 | 1.14e+08 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

Ri factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Meat & Poultry Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ho-166m | 4.86e+06 | 1.02e+06 | 8.59e+05 | 0.00e+00 | 1.45e+06 | 0.00e+00 | 1.18e+08 |
| W-181 | 4.80e+04 | 1.18e+04 | 1.62e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.30e+05 |
| W-185 | 1.72e+06 | 4.30e+05 | 6.02e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.60e+07 |
| W-187 | 3.49e-02 | 2.06e-02 | 9.27e-03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.90e+00 |
| Pb-210 | 1.40e+10 | 3.60e+09 | 6.17e+08 | 0.00e+00 | 1.08e+10 | 0.00e+00 | 6.79e+05 |
| Bi-210 | 4.34e+05 | 2.24e+06 | 2.49e+05 | 0.00e+00 | 2.53e+07 | 0.00e+00 | 1.14e+07 |
| Po-210 | 1.53e+10 | 2.45e+10 | 3.70e+09 | 0.00e+00 | 7.61e+10 | 0.00e+00 | 6.60e+08 |
| Ra-223 | 9.80e+10 | 1.13e+08 | 1.96e+10 | 0.00e+00 | 3.00e+09 | 0.00e+00 | 1.56e+09 |
| Ra-224 | 1.12e+09 | 2.04e+06 | 2.25e+08 | 0.00e+00 | 5.40e+07 | 0.00e+00 | 6.17e+07 |
| Ra-225 | 1.96e+11 | 1.75e+08 | 3.91e+10 | 0.00e+00 | 4.63e+09 | 0.00e+00 | 2.25e+09 |
| Ra-226 | 2.00e+13 | 6.39e+08 | 1.64e+13 | 0.00e+00 | 1.70e+10 | 0.00e+00 | 1.18e+10 |
| Ra-228 | 1.32e+13 | 3.43e+08 | 1.48e+13 | 0.00e+00 | 9.09e+09 | 0.00e+00 | 1.99e+09 |
| Ac-225 | 1.20e+08 | 1.24e+08 | 8.05e+06 | 0.00e+00 | 1.32e+07 | 0.00e+00 | 2.75e+09 |
| Ac-227 | 2.52e+11 | 4.05e+10 | 1.56e+10 | 0.00e+00 | 8.92e+09 | 0.00e+00 | 5.15e+09 |
| Th-227 | 3.22e+06 | 4.38e+04 | 9.30e+04 | 0.00e+00 | 2.32e+05 | 0.00e+00 | 3.10e+07 |
| Th-228 | 4.07e+08 | 5.21e+06 | 1.38e+07 | 0.00e+00 | 2.71e+07 | 0.00e+00 | 1.14e+08 |
| Th-229 | 4.80e+09 | 1.21e+08 | 8.01e+07 | 0.00e+00 | 5.91e+08 | 0.00e+00 | 1.64e+07 |
| Th-230 | 7.26e+08 | 3.64e+07 | 2.03e+07 | 0.00e+00 | 1.77e+08 | 0.00e+00 | 1.27e+07 |
| Th-232 | 8.10e+08 | 3.11e+07 | 6.15e+05 | 0.00e+00 | 1.51e+08 | 0.00e+00 | 1.08e+07 |
| Th-234 | 2.49e+04 | 1.10e+03 | 7.19e+02 | 0.00e+00 | 5.83e+03 | 0.00e+00 | 8.58e+06 |
| Pa-231 | 5.78e+15 | 1.91e+14 | 2.30e+14 | 0.00e+00 | 1.05e+15 | 0.00e+00 | 6.03e+13 |
| Pa-233 | 5.91e+09 | 9.20e+08 | 1.03e+09 | 0.00e+00 | 3.39e+09 | 0.00e+00 | 4.70e+12 |
| U-232 | 6.11e+09 | 0.00e+00 | 4.37e+08 | 0.00e+00 | 4.65e+08 | 0.00e+00 | 2.42e+07 |
| U-233 | 1.29e+09 | 0.00e+00 | 7.82e+07 | 0.00e+00 | 2.12e+08 | 0.00e+00 | 2.24e+07 |
| U-234 | 1.24e+09 | 0.00e+00 | 7.68e+07 | 0.00e+00 | 2.08e+08 | 0.00e+00 | 2.20e+07 |
| U-235 | 1.19e+09 | 0.00e+00 | 7.19e+07 | 0.00e+00 | 1.95e+08 | 0.00e+00 | 2.79e+07 |
| U-236 | 1.19e+09 | 0.00e+00 | 7.37e+07 | 0.00e+00 | 1.99e+08 | 0.00e+00 | 2.06e+07 |
| U-237 | 3.42e+03 | 0.00e+00 | 9.09e+02 | 0.00e+00 | 9.87e+03 | 0.00e+00 | 3.02e+05 |
| U-238 | 1.14e+09 | 0.00e+00 | 6.74e+07 | 0.00e+00 | 1.82e+08 | 0.00e+00 | 1.97e+07 |
| Np-237 | 4.56e+08 | 3.01e+07 | 2.00e+07 | 0.00e+00 | 1.24e+08 | 0.00e+00 | 1.67e+07 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# MEAT PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Meat & Poultry Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Np-238 | 2.27e+00 | 4.59e-02 | 3.53e-02 | 0.00e+00 | 1.46e-01 | 0.00e+00 | 1.57e+03 |
| Np-239 | 4.29e-01 | 3.08e-02 | 2.17e-02 | 0.00e+00 | 8.91e-02 | 0.00e+00 | 2.28e+03 |
| Pu-238 | 1.70e+07 | 1.97e+06 | 4.52e+05 | 0.00e+00 | 1.64e+06 | 0.00e+00 | 1.07e+06 |
| Pu-239 | 1.85e+07 | 1.97e+06 | 4.74e+05 | 0.00e+00 | 1.75e+06 | 0.00e+00 | 9.80e+05 |
| Pu-240 | 1.83e+07 | 2.05e+06 | 4.74e+05 | 0.00e+00 | 1.75e+06 | 0.00e+00 | 9.99e+05 |
| Pu-241 | 5.51e+05 | 2.25e+04 | 1.14e+04 | 0.00e+00 | 4.21e+04 | 0.00e+00 | 2.05e+04 |
| Pu-242 | 1.70e+07 | 1.97e+06 | 4.56e+05 | 0.00e+00 | 1.67e+06 | 0.00e+00 | 9.60e+05 |
| Pu-244 | 1.99e+07 | 2.26e+07 | 5.22e+05 | 0.00e+00 | 1.93e+06 | 0.00e+00 | 1.43e+06 |
| Am-241 | 2.73e+08 | 2.35e+08 | 2.05e+07 | 0.00e+00 | 1.25e+08 | 0.00e+00 | 1.53e+07 |
| Am-242m | 2.86e+08 | 2.29e+08 | 2.12e+07 | 0.00e+00 | 1.29e+08 | 0.00e+00 | 1.96e+07 |
| Am-243 | 2.74e+08 | 2.31e+08 | 2.01e+07 | 0.00e+00 | 1.24e+08 | 0.00e+00 | 1.83e+07 |
| Cm-242 | 1.52e+07 | 1.21e+07 | 1.01e+06 | 0.00e+00 | 3.23e+06 | 0.00e+00 | 1.41e+07 |
| Cm-243 | 2.61e+08 | 2.12e+08 | 1.68e+07 | 0.00e+00 | 6.28e+07 | 0.00e+00 | 1.64e+07 |
| Cm-244 | 2.20e+08 | 1.78e+08 | 1.41e+07 | 0.00e+00 | 5.17e+07 | 0.00e+00 | 1.58e+07 |
| Cm-245 | 3.41e+08 | 2.74e+08 | 2.15e+07 | 0.00e+00 | 8.40e+07 | 0.00e+00 | 1.48e+07 |
| Cm-246 | 3.37e+08 | 2.74e+08 | 2.15e+07 | 0.00e+00 | 8.38e+07 | 0.00e+00 | 1.45e+07 |
| Cm-247 | 3.29e+08 | 2.70e+08 | 2.11e+07 | 0.00e+00 | 8.26e+07 | 0.00e+00 | 1.91e+07 |
| Cm-248 | 2.74e+09 | 2.23e+09 | 1.74e+08 | 0.00e+00 | 6.81e+08 | 0.00e+00 | 3.09e+08 |
| Cf-252 | 2.08e+08 | 0.00e+00 | 5.03e+06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.87e+07 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# MEAT PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Meat & Poultry Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| H-3 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Be-10 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| C-14 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| N-13 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| F-18 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Na-22 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Na-24 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| P-32 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ca-41 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sc-46 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cr-51 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Mn-54 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Mn-56 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Fe-55 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Fe-59 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Co-57 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Co-58 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Co-60 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ni-59 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ni-63 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ni-65 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cu-64 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Zn-65 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Zn-69 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Zn-69m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Se-79 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-82 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-83 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-84 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-85 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# MEAT PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Meat & Poultry Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Rb-86 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Rb-87 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Rb-88 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Rb-89 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sr-89 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sr-90 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sr-91 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sr-92 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Y-90 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Y-91 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Y-91m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Y-92 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Y-93 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Zr-93 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Zr-95 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Zr-97 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Nb-93m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Nb-95 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Nb-97 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Mo-93 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Mo-99 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Tc-101 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Tc-99 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Tc-99m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ru-103 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ru-105 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ru-106 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Rh-105 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Pd-107 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Pd-109 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

Ri factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Meat & Poultry Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ag-110m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ag-111 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cd-113m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cd-115m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sn-123 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sn-125 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sn-126 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sb-124 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sb-125 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sb-126 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sb-127 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Te-125m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Te-127 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Te-127m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Te-129 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Te-129m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Te-131 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Te-131m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Te-132 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Te-133m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Te-134 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| I-129 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| I-130 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| I-131 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| I-132 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| I-133 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| I-134 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| I-135 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cs-134 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cs-134m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

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# MEAT PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Meat & Poultry Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Cs-135 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cs-136 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cs-137 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cs-138 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cs-139 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-139 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-140 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-141 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-142 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| La-140 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| La-141 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| La-142 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ce-141 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ce-143 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ce-144 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Pr-143 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Pr-144 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Nd-147 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Pm-147 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Pm-148 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Pm-148m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Pm-149 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Pm-151 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sm-151 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sm-153 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Eu-152 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Eu-154 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Eu-155 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Eu-156 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Tb-160 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# MEAT PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Meat & Poultry Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ho-166m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| W-181 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| W-185 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| W-187 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Pb-210 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Bi-210 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Po-210 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ra-223 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ra-224 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ra-225 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ra-226 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ra-228 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ac-225 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ac-227 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Th-227 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Th-228 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Th-229 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Th-230 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Th-232 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Th-234 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Pa-231 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Pa-233 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| U-232 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| U-233 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| U-234 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| U-235 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| U-236 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| U-237 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| U-238 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Np-237 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# MEAT PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Meat & Poultry Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Np-238 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Np-239 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Pu-238 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Pu-239 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Pu-240 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Pu-241 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Pu-242 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Pu-244 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Am-241 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Am-242m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Am-243 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cm-242 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cm-243 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cm-244 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cm-245 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cm-246 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cm-247 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cm-248 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cf-252 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# LEAFY VEGETABLE PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Leafy/Produce Vegetation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| H-3 | 0.00e+00 | 1.29e+03 | 1.29e+03 | 1.29e+03 | 1.29e+03 | 1.29e+03 | 1.29e+03 |
| Be-10 | 2.55e+08 | 3.93e+07 | 6.36e+06 | 0.00e+00 | 2.97e+07 | 0.00e+00 | 2.15e+09 |
| C-14 | 2.28e+08 | 4.55e+07 | 4.55e+07 | 4.55e+07 | 4.55e+07 | 4.55e+07 | 4.55e+07 |
| N-13 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| F-18 | 4.26e+00 | 0.00e+00 | 4.72e-01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.26e-01 |
| Na-22 | 1.32e+09 | 1.32e+09 | 1.32e+09 | 1.32e+09 | 1.32e+09 | 1.32e+09 | 1.32e+09 |
| Na-24 | 2.68e+05 | 2.68e+05 | 2.68e+05 | 2.68e+05 | 2.68e+05 | 2.68e+05 | 2.68e+05 |
| P-32 | 1.40e+09 | 8.73e+07 | 5.42e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.58e+08 |
| Ca-41 | 1.48e+10 | 0.00e+00 | 1.60e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.47e+07 |
| Sc-46 | 2.51e+05 | 4.86e+05 | 1.41e+05 | 0.00e+00 | 4.54e+05 | 0.00e+00 | 2.37e+09 |
| Cr-51 | 0.00e+00 | 0.00e+00 | 4.64e+04 | 2.77e+04 | 1.02e+04 | 6.16e+04 | 1.17e+07 |
| Mn-54 | 0.00e+00 | 3.13e+08 | 5.97e+07 | 0.00e+00 | 9.31e+07 | 0.00e+00 | 9.58e+08 |
| Mn-56 | 0.00e+00 | 1.53e+01 | 2.72e+00 | 0.00e+00 | 1.94e+01 | 0.00e+00 | 4.89e+02 |
| Fe-55 | 2.10e+08 | 1.45e+08 | 3.38e+07 | 0.00e+00 | 0.00e+00 | 8.08e+07 | 8.31e+07 |
| Fe-59 | 1.26e+08 | 2.96e+08 | 1.14e+08 | 0.00e+00 | 0.00e+00 | 8.28e+07 | 9.88e+08 |
| Co-57 | 0.00e+00 | 1.17e+07 | 1.94e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.97e+08 |
| Co-58 | 0.00e+00 | 3.07e+07 | 6.89e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.23e+08 |
| Co-60 | 0.00e+00 | 1.67e+08 | 3.69e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.14e+09 |
| Ni-59 | 7.82e+08 | 2.68e+08 | 1.31e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.53e+07 |
| Ni-63 | 1.04e+10 | 7.21e+08 | 3.49e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.50e+08 |
| Ni-65 | 5.96e+01 | 7.75e+00 | 3.54e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.97e+02 |
| Cu-64 | 0.00e+00 | 9.15e+03 | 4.29e+03 | 0.00e+00 | 2.31e+04 | 0.00e+00 | 7.79e+05 |
| Zn-65 | 3.17e+08 | 1.01e+09 | 4.56e+08 | 0.00e+00 | 6.75e+08 | 0.00e+00 | 6.36e+08 |
| Zn-69 | 5.06e-06 | 9.67e-06 | 6.72e-07 | 0.00e+00 | 6.28e-06 | 0.00e+00 | 1.45e-06 |
| Zn-69m | 2.24e+04 | 5.38e+04 | 4.92e+03 | 0.00e+00 | 3.26e+04 | 0.00e+00 | 3.29e+06 |
| Se-79 | 0.00e+00 | 2.11e+08 | 3.52e+07 | 0.00e+00 | 3.65e+08 | 0.00e+00 | 4.31e+07 |
| Br-82 | 0.00e+00 | 0.00e+00 | 1.50e+06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.72e+06 |
| Br-83 | 0.00e+00 | 0.00e+00 | 3.01e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.33e+00 |
| Br-84 | 0.00e+00 | 0.00e+00 | 2.14e-11 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.68e-16 |
| Br-85 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# LEAFY VEGETABLE PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Leafy/Produce Vegetation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Rb-86 | 0.00e+00 | 2.19e+08 | 1.02e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.32e+07 |
| Rb-87 | 0.00e+00 | 9.86e+08 | 3.43e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.62e+07 |
| Rb-88 | 0.00e+00 | 2.64e-22 | 1.40e-22 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.65e-33 |
| Rb-89 | 0.00e+00 | 2.88e-26 | 2.03e-26 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.67e-39 |
| Sr-89 | 9.96e+09 | 0.00e+00 | 2.86e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.60e+09 |
| Sr-90 | 6.95e+11 | 0.00e+00 | 1.40e+10 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.75e+10 |
| Sr-91 | 3.02e+05 | 0.00e+00 | 1.22e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.44e+06 |
| Sr-92 | 4.15e+02 | 0.00e+00 | 1.79e+01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 8.21e+03 |
| Y-90 | 1.33e+04 | 0.00e+00 | 3.56e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.41e+08 |
| Y-91 | 5.11e+06 | 0.00e+00 | 1.37e+05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.81e+09 |
| Y-91m | 4.76e-09 | 0.00e+00 | 1.84e-10 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.40e-08 |
| Y-92 | 8.96e-01 | 0.00e+00 | 2.62e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.57e+04 |
| Y-93 | 1.68e+02 | 0.00e+00 | 4.65e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.34e+06 |
| Zr-93 | 3.35e+06 | 1.88e+05 | 8.73e+04 | 0.00e+00 | 7.11e+05 | 0.00e+00 | 1.95e+08 |
| Zr-95 | 1.17e+06 | 3.77e+05 | 2.55e+05 | 0.00e+00 | 5.91e+05 | 0.00e+00 | 1.19e+09 |
| Zr-97 | 3.36e+02 | 6.78e+01 | 3.10e+01 | 0.00e+00 | 1.02e+02 | 0.00e+00 | 2.10e+07 |
| Nb-93m | 2.02e+06 | 6.60e+05 | 1.63e+05 | 0.00e+00 | 7.59e+05 | 0.00e+00 | 3.05e+08 |
| Nb-95 | 1.42e+05 | 7.91e+04 | 4.25e+04 | 0.00e+00 | 7.82e+04 | 0.00e+00 | 4.80e+08 |
| Nb-97 | 2.84e-06 | 7.19e-07 | 2.63e-07 | 0.00e+00 | 8.39e-07 | 0.00e+00 | 2.65e-03 |
| Mo-93 | 0.00e+00 | 6.02e+08 | 1.63e+07 | 0.00e+00 | 1.71e+08 | 0.00e+00 | 9.78e+07 |
| Mo-99 | 0.00e+00 | 6.14e+06 | 1.17e+06 | 0.00e+00 | 1.39e+07 | 0.00e+00 | 1.42e+07 |
| Tc-101 | 5.93e-31 | 8.55e-31 | 8.39e-30 | 0.00e+00 | 1.54e-29 | 4.37e-31 | 0.00e+00 |
| Tc-99 | 1.00e+07 | 1.49e+07 | 4.02e+06 | 0.00e+00 | 1.88e+08 | 1.27e+06 | 4.87e+08 |
| Tc-99m | 3.06e+00 | 8.66e+00 | 1.10e+02 | 0.00e+00 | 1.31e+02 | 4.24e+00 | 5.12e+03 |
| Ru-103 | 4.77e+06 | 0.00e+00 | 2.05e+06 | 0.00e+00 | 1.82e+07 | 0.00e+00 | 5.57e+08 |
| Ru-105 | 5.29e+01 | 0.00e+00 | 2.09e+01 | 0.00e+00 | 6.84e+02 | 0.00e+00 | 3.24e+04 |
| Ru-106 | 1.93e+08 | 0.00e+00 | 2.44e+07 | 0.00e+00 | 3.72e+08 | 0.00e+00 | 1.25e+10 |
| Rh-105 | 8.01e+04 | 5.86e+04 | 3.86e+04 | 0.00e+00 | 2.49e+05 | 0.00e+00 | 9.34e+06 |
| Pd-107 | 0.00e+00 | 1.18e+07 | 7.53e+05 | 0.00e+00 | 1.06e+08 | 0.00e+00 | 7.30e+07 |
| Pd-109 | 0.00e+00 | 2.23e+04 | 5.02e+03 | 0.00e+00 | 1.27e+05 | 0.00e+00 | 2.47e+06 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# LEAFY VEGETABLE PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Leafy/Produce Vegetation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ag-110m | 1.05e+07 | 9.74e+06 | 5.79e+06 | 0.00e+00 | 1.92e+07 | 0.00e+00 | 3.98e+09 |
| Ag-111 | 2.11e+05 | 8.81e+04 | 4.39e+04 | 0.00e+00 | 2.84e+05 | 0.00e+00 | 1.62e+08 |
| Cd-113m | 0.00e+00 | 2.52e+08 | 8.10e+06 | 0.00e+00 | 2.78e+08 | 0.00e+00 | 2.03e+09 |
| Cd-115m | 0.00e+00 | 5.34e+07 | 1.70e+06 | 0.00e+00 | 4.24e+07 | 0.00e+00 | 2.25e+09 |
| Sn-123 | 1.71e+09 | 2.84e+07 | 4.18e+07 | 2.41e+07 | 0.00e+00 | 0.00e+00 | 3.49e+09 |
| Sn-125 | 3.84e+07 | 7.74e+05 | 1.74e+06 | 6.40e+05 | 0.00e+00 | 0.00e+00 | 4.79e+08 |
| Sn-126 | 6.77e+09 | 1.34e+08 | 1.92e+08 | 3.94e+07 | 0.00e+00 | 0.00e+00 | 1.95e+09 |
| Sb-124 | 1.04e+08 | 1.96e+06 | 4.11e+07 | 2.51e+05 | 0.00e+00 | 8.07e+07 | 2.94e+09 |
| Sb-125 | 1.37e+08 | 1.53e+06 | 3.25e+07 | 1.39e+05 | 0.00e+00 | 1.05e+08 | 1.50e+09 |
| Sb-126 | 7.07e+06 | 1.44e+05 | 2.55e+06 | 4.33e+04 | 0.00e+00 | 4.34e+06 | 5.78e+08 |
| Sb-127 | 5.22e+05 | 1.14e+04 | 2.00e+05 | 6.28e+03 | 0.00e+00 | 3.10e+05 | 1.19e+08 |
| Te-125m | 9.65e+07 | 3.50e+07 | 1.29e+07 | 2.90e+07 | 3.93e+08 | 0.00e+00 | 3.85e+08 |
| Te-127 | 5.61e+03 | 2.02e+03 | 1.21e+03 | 4.16e+03 | 2.29e+04 | 0.00e+00 | 4.43e+05 |
| Te-127m | 3.49e+08 | 1.25e+08 | 4.25e+07 | 8.92e+07 | 1.42e+09 | 0.00e+00 | 1.17e+09 |
| Te-129 | 7.13e-04 | 2.68e-04 | 1.74e-04 | 5.48e-04 | 3.00e-03 | 0.00e+00 | 5.38e-04 |
| Te-129m | 2.51e+08 | 9.37e+07 | 3.98e+07 | 8.63e+07 | 1.05e+09 | 0.00e+00 | 1.26e+09 |
| Te-131 | 1.25e-15 | 5.21e-16 | 3.94e-16 | 1.03e-15 | 5.47e-15 | 0.00e+00 | 1.77e-16 |
| Te-131m | 9.10e+05 | 4.45e+05 | 3.71e+05 | 7.05e+05 | 4.51e+06 | 0.00e+00 | 4.42e+07 |
| Te-132 | 4.30e+06 | 2.78e+06 | 2.61e+06 | 3.07e+06 | 2.68e+07 | 0.00e+00 | 1.31e+08 |
| Te-133m | 2.12e-05 | 1.24e-05 | 1.19e-05 | 1.79e-05 | 1.22e-04 | 0.00e+00 | 4.24e-06 |
| Te-134 | 3.19e-08 | 2.09e-08 | 1.28e-08 | 2.79e-08 | 2.02e-07 | 0.00e+00 | 3.54e-11 |
| I-129 | 1.31e+09 | 1.13e+09 | 3.69e+09 | 2.90e+12 | 2.42e+09 | 0.00e+00 | 1.78e+08 |
| I-130 | 3.90e+05 | 1.15e+06 | 4.54e+05 | 9.75e+07 | 1.79e+06 | 0.00e+00 | 9.90e+05 |
| I-131 | 8.07e+07 | 1.15e+08 | 6.62e+07 | 3.78e+10 | 1.98e+08 | 0.00e+00 | 3.05e+07 |
| I-132 | 5.57e+01 | 1.49e+02 | 5.21e+01 | 5.21e+03 | 2.37e+02 | 0.00e+00 | 2.80e+01 |
| I-133 | 2.08e+06 | 3.61e+06 | 1.10e+06 | 5.31e+08 | 6.31e+06 | 0.00e+00 | 3.25e+06 |
| I-134 | 8.84e-05 | 2.40e-04 | 8.59e-05 | 4.16e-03 | 3.82e-04 | 0.00e+00 | 2.09e-07 |
| I-135 | 3.85e+04 | 1.01e+05 | 3.72e+04 | 6.65e+06 | 1.62e+05 | 0.00e+00 | 1.14e+05 |
| Cs-134 | 4.67e+09 | 1.11e+10 | 9.08e+09 | 0.00e+00 | 3.59e+09 | 1.19e+09 | 1.94e+08 |
| Cs-134m | 6.57e+00 | 1.38e+01 | 7.06e+00 | 0.00e+00 | 7.49e+00 | 1.18e+00 | 4.87e+00 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# LEAFY VEGETABLE PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Leafy/Produce Vegetation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Cs-135 | 1.56e+09 | 1.44e+09 | 6.40e+08 | 0.00e+00 | 5.46e+08 | 1.63e+08 | 3.37e+07 |
| Cs-136 | 4.26e+07 | 1.68e+08 | 1.21e+08 | 0.00e+00 | 9.37e+07 | 1.28e+07 | 1.91e+07 |
| Cs-137 | 6.36e+09 | 8.70e+09 | 5.70e+09 | 0.00e+00 | 2.95e+09 | 9.81e+08 | 1.68e+08 |
| Cs-138 | 3.39e-11 | 6.70e-11 | 3.32e-11 | 0.00e+00 | 4.92e-11 | 4.86e-12 | 2.86e-16 |
| Cs-139 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-139 | 2.70e-02 | 1.92e-05 | 7.91e-04 | 0.00e+00 | 1.80e-05 | 1.09e-05 | 4.79e-02 |
| Ba-140 | 1.28e+08 | 1.61e+05 | 8.41e+06 | 0.00e+00 | 5.48e+04 | 9.23e+04 | 2.64e+08 |
| Ba-141 | 8.94e-22 | 6.76e-25 | 3.02e-23 | 0.00e+00 | 6.28e-25 | 3.83e-25 | 4.21e-31 |
| Ba-142 | 3.88e-39 | 0.00e+00 | 2.44e-40 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| La-140 | 1.97e+03 | 9.95e+02 | 2.63e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.30e+07 |
| La-141 | 5.98e-01 | 1.85e-01 | 3.04e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.21e+04 |
| La-142 | 1.92e-04 | 8.75e-05 | 2.18e-05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.39e-01 |
| Ce-141 | 1.97e+05 | 1.33e+05 | 1.51e+04 | 0.00e+00 | 6.19e+04 | 0.00e+00 | 5.09e+08 |
| Ce-143 | 9.95e+02 | 7.36e+05 | 8.14e+01 | 0.00e+00 | 3.24e+02 | 0.00e+00 | 2.75e+07 |
| Ce-144 | 3.29e+07 | 1.38e+07 | 1.77e+06 | 0.00e+00 | 8.16e+06 | 0.00e+00 | 1.11e+10 |
| Pr-143 | 6.26e+04 | 2.51e+04 | 3.10e+03 | 0.00e+00 | 1.45e+04 | 0.00e+00 | 2.74e+08 |
| Pr-144 | 2.36e-26 | 9.81e-27 | 1.20e-27 | 0.00e+00 | 5.53e-27 | 0.00e+00 | 3.40e-33 |
| Nd-147 | 3.33e+04 | 3.85e+04 | 2.30e+03 | 0.00e+00 | 2.25e+04 | 0.00e+00 | 1.85e+08 |
| Pm-147 | 5.74e+06 | 5.39e+05 | 2.18e+05 | 0.00e+00 | 1.02e+06 | 0.00e+00 | 6.79e+08 |
| Pm-148 | 1.96e+04 | 3.25e+03 | 1.64e+03 | 0.00e+00 | 6.14e+03 | 0.00e+00 | 2.55e+08 |
| Pm-148m | 8.29e+05 | 2.15e+05 | 1.64e+05 | 0.00e+00 | 3.24e+05 | 0.00e+00 | 1.82e+09 |
| Pm-149 | 1.69e+03 | 2.39e+02 | 9.77e+01 | 0.00e+00 | 4.52e+02 | 0.00e+00 | 4.48e+07 |
| Pm-151 | 3.36e+02 | 5.65e+01 | 2.85e+01 | 0.00e+00 | 1.01e+02 | 0.00e+00 | 1.55e+07 |
| Sm-151 | 5.52e+06 | 9.52e+05 | 2.28e+05 | 0.00e+00 | 1.06e+06 | 0.00e+00 | 4.20e+08 |
| Sm-153 | 8.20e+02 | 6.84e+02 | 5.00e+01 | 0.00e+00 | 2.21e+02 | 0.00e+00 | 2.44e+07 |
| Eu-152 | 1.55e+07 | 3.52e+06 | 3.09e+06 | 0.00e+00 | 2.18e+07 | 0.00e+00 | 2.03e+09 |
| Eu-154 | 4.92e+07 | 6.05e+06 | 4.31e+06 | 0.00e+00 | 2.90e+07 | 0.00e+00 | 4.39e+09 |
| Eu-155 | 6.39e+06 | 9.07e+05 | 5.85e+05 | 0.00e+00 | 4.18e+06 | 0.00e+00 | 7.13e+08 |
| Eu-156 | 1.08e+05 | 8.35e+04 | 1.35e+04 | 0.00e+00 | 5.58e+04 | 0.00e+00 | 5.72e+08 |
| Tb-160 | 1.96e+06 | 0.00e+00 | 2.44e+05 | 0.00e+00 | 8.09e+05 | 0.00e+00 | 1.81e+09 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# LEAFY VEGETABLE PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Leafy/Produce Vegetation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ho-166m | 2.16e+07 | 6.75e+06 | 5.13e+06 | 0.00e+00 | 1.01e+07 | 0.00e+00 | 2.05e+09 |
| W-181 | 5.33e+05 | 1.74e+05 | 1.86e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.98e+07 |
| W-185 | 1.73e+07 | 5.77e+06 | 6.07e+05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.67e+08 |
| W-187 | 3.79e+04 | 3.17e+04 | 1.11e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.04e+07 |
| Pb-210 | 1.22e+12 | 3.48e+11 | 4.33e+10 | 0.00e+00 | 9.79e+11 | 0.00e+00 | 1.78e+08 |
| Bi-210 | 1.18e+06 | 8.17e+06 | 6.78e+05 | 0.00e+00 | 9.83e+07 | 0.00e+00 | 1.22e+08 |
| Po-210 | 2.01e+10 | 4.26e+10 | 4.85e+09 | 0.00e+00 | 1.42e+11 | 0.00e+00 | 3.59e+09 |
| Ra-223 | 2.74e+10 | 4.23e+07 | 5.49e+09 | 0.00e+00 | 1.20e+09 | 0.00e+00 | 1.77e+09 |
| Ra-224 | 3.08e+09 | 7.47e+06 | 6.19e+08 | 0.00e+00 | 2.11e+08 | 0.00e+00 | 6.51e+08 |
| Ra-225 | 4.99e+10 | 5.92e+07 | 9.97e+09 | 0.00e+00 | 1.68e+09 | 0.00e+00 | 2.33e+09 |
| Ra-226 | 2.42e+13 | 4.60e+08 | 1.76e+13 | 0.00e+00 | 1.31e+10 | 0.00e+00 | 2.66e+10 |
| Ra-228 | 8.76e+12 | 2.44e+08 | 9.47e+12 | 0.00e+00 | 6.91e+09 | 0.00e+00 | 4.41e+09 |
| Ac-225 | 2.11e+07 | 2.90e+07 | 1.42e+06 | 0.00e+00 | 3.31e+06 | 0.00e+00 | 1.95e+09 |
| Ac-227 | 1.49e+11 | 1.97e+10 | 8.84e+09 | 0.00e+00 | 6.37e+09 | 0.00e+00 | 6.52e+09 |
| Th-227 | 1.41e+08 | 2.55e+06 | 4.06e+06 | 0.00e+00 | 1.45e+07 | 0.00e+00 | 5.55e+09 |
| Th-228 | 3.70e+10 | 6.27e+08 | 1.25e+09 | 0.00e+00 | 3.49e+09 | 0.00e+00 | 4.20e+10 |
| Th-229 | 1.09e+12 | 3.12e+10 | 1.80e+10 | 0.00e+00 | 1.51e+11 | 0.00e+00 | 6.26e+09 |
| Th-230 | 1.65e+11 | 9.38e+09 | 4.57e+09 | 0.00e+00 | 4.53e+10 | 0.00e+00 | 4.82e+09 |
| Th-232 | 1.84e+11 | 8.01e+09 | 1.20e+08 | 0.00e+00 | 3.86e+10 | 0.00e+00 | 4.10e+09 |
| Th-234 | 1.17e+06 | 6.89e+04 | 3.38e+04 | 0.00e+00 | 3.91e+05 | 0.00e+00 | 1.65e+09 |
| Pa-231 | 3.29e+11 | 1.23e+10 | 1.27e+10 | 0.00e+00 | 6.92e+10 | 0.00e+00 | 5.75e+09 |
| Pa-233 | 9.05e+04 | 1.82e+04 | 1.57e+04 | 0.00e+00 | 6.87e+04 | 0.00e+00 | 2.82e+08 |
| U-232 | 3.30e+11 | 0.00e+00 | 2.36e+10 | 0.00e+00 | 3.58e+10 | 0.00e+00 | 5.42e+09 |
| U-233 | 6.98e+10 | 0.00e+00 | 4.23e+09 | 0.00e+00 | 1.63e+10 | 0.00e+00 | 5.02e+09 |
| U-234 | 6.70e+10 | 0.00e+00 | 4.14e+09 | 0.00e+00 | 1.59e+10 | 0.00e+00 | 4.92e+09 |
| U-235 | 6.42e+10 | 0.00e+00 | 3.89e+09 | 0.00e+00 | 1.50e+10 | 0.00e+00 | 6.26e+09 |
| U-236 | 6.42e+10 | 0.00e+00 | 3.97e+09 | 0.00e+00 | 1.53e+10 | 0.00e+00 | 4.62e+09 |
| U-237 | 1.84e+05 | 0.00e+00 | 4.89e+04 | 0.00e+00 | 7.55e+05 | 0.00e+00 | 6.45e+07 |
| U-238 | 6.15e+10 | 0.00e+00 | 3.64e+09 | 0.00e+00 | 1.40e+10 | 0.00e+00 | 4.41e+09 |
| Np-237 | 1.01e+11 | 7.18e+09 | 4.44e+09 | 0.00e+00 | 3.30e+10 | 0.00e+00 | 6.36e+09 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# LEAFY VEGETABLE PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Leafy/Produce Vegetation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Np-238 | 1.45e+04 | 3.91e+02 | 2.26e+02 | 0.00e+00 | 1.32e+03 | 0.00e+00 | 3.63e+07 |
| Np-239 | 1.43e+03 | 1.40e+02 | 7.73e+01 | 0.00e+00 | 4.37e+02 | 0.00e+00 | 2.88e+07 |
| Pu-238 | 5.04e+10 | 6.38e+09 | 1.37e+09 | 0.00e+00 | 5.86e+09 | 0.00e+00 | 5.84e+09 |
| Pu-239 | 5.81e+10 | 6.98e+09 | 1.53e+09 | 0.00e+00 | 6.50e+09 | 0.00e+00 | 5.34e+09 |
| Pu-240 | 5.80e+10 | 6.97e+09 | 1.53e+09 | 0.00e+00 | 6.49e+09 | 0.00e+00 | 5.43e+09 |
| Pu-241 | 1.25e+09 | 5.92e+07 | 2.64e+07 | 0.00e+00 | 1.22e+08 | 0.00e+00 | 1.11e+08 |
| Pu-242 | 5.39e+10 | 6.72e+09 | 1.47e+09 | 0.00e+00 | 6.26e+09 | 0.00e+00 | 5.23e+09 |
| Pu-244 | 6.28e+10 | 7.70e+09 | 1.69e+09 | 0.00e+00 | 7.17e+09 | 0.00e+00 | 7.80e+09 |
| Am-241 | 5.86e+10 | 5.47e+10 | 4.20e+09 | 0.00e+00 | 3.16e+10 | 0.00e+00 | 5.76e+09 |
| Am-242m | 6.09e+10 | 5.31e+10 | 4.35e+09 | 0.00e+00 | 3.24e+10 | 0.00e+00 | 7.48e+09 |
| Am-243 | 6.04e+10 | 5.53e+10 | 4.25e+09 | 0.00e+00 | 3.20e+10 | 0.00e+00 | 6.97e+09 |
| Cm-242 | 1.22e+09 | 1.30e+09 | 8.14e+07 | 0.00e+00 | 3.70e+08 | 0.00e+00 | 4.71e+09 |
| Cm-243 | 4.78e+10 | 4.38e+10 | 2.99e+09 | 0.00e+00 | 1.40e+10 | 0.00e+00 | 6.23e+09 |
| Cm-244 | 3.63e+10 | 3.40e+10 | 2.28e+09 | 0.00e+00 | 1.07e+10 | 0.00e+00 | 6.00e+09 |
| Cm-245 | 7.52e+10 | 6.55e+10 | 4.62e+09 | 0.00e+00 | 2.16e+10 | 0.00e+00 | 5.64e+09 |
| Cm-246 | 7.45e+10 | 6.54e+10 | 4.61e+09 | 0.00e+00 | 2.15e+10 | 0.00e+00 | 5.54e+09 |
| Cm-247 | 7.27e+10 | 6.44e+10 | 4.54e+09 | 0.00e+00 | 2.12e+10 | 0.00e+00 | 7.28e+09 |
| Cm-248 | 6.04e+11 | 5.31e+11 | 3.74e+10 | 0.00e+00 | 1.75e+11 | 0.00e+00 | 1.18e+11 |
| Cf-252 | 1.98e+10 | 0.00e+00 | 4.77e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.18e+10 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# LEAFY VEGETABLE PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Leafy/Produce Vegetation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| H-3 | 0.00e+00 | 1.47e+03 | 1.47e+03 | 1.47e+03 | 1.47e+03 | 1.47e+03 | 1.47e+03 |
| Be-10 | 4.07e+08 | 6.31e+07 | 1.03e+07 | 0.00e+00 | 4.82e+07 | 0.00e+00 | 2.58e+09 |
| C-14 | 3.69e+08 | 7.38e+07 | 7.38e+07 | 7.38e+07 | 7.38e+07 | 7.38e+07 | 7.38e+07 |
| N-13 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| F-18 | 3.87e+00 | 0.00e+00 | 4.24e-01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.48e-01 |
| Na-22 | 2.01e+09 | 2.01e+09 | 2.01e+09 | 2.01e+09 | 2.01e+09 | 2.01e+09 | 2.01e+09 |
| Na-24 | 2.38e+05 | 2.38e+05 | 2.38e+05 | 2.38e+05 | 2.38e+05 | 2.38e+05 | 2.38e+05 |
| P-32 | 1.61e+09 | 9.96e+07 | 6.23e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.35e+08 |
| Ca-41 | 1.79e+10 | 0.00e+00 | 1.94e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.77e+07 |
| Sc-46 | 3.61e+05 | 7.02e+05 | 2.08e+05 | 0.00e+00 | 6.72e+05 | 0.00e+00 | 2.39e+09 |
| Cr-51 | 0.00e+00 | 0.00e+00 | 6.16e+04 | 3.42e+04 | 1.35e+04 | 8.80e+04 | 1.04e+07 |
| Mn-54 | 0.00e+00 | 4.54e+08 | 9.01e+07 | 0.00e+00 | 1.36e+08 | 0.00e+00 | 9.32e+08 |
| Mn-56 | 0.00e+00 | 1.38e+01 | 2.46e+00 | 0.00e+00 | 1.75e+01 | 0.00e+00 | 9.09e+02 |
| Fe-55 | 3.26e+08 | 2.31e+08 | 5.39e+07 | 0.00e+00 | 0.00e+00 | 1.47e+08 | 1.00e+08 |
| Fe-59 | 1.79e+08 | 4.18e+08 | 1.62e+08 | 0.00e+00 | 0.00e+00 | 1.32e+08 | 9.90e+08 |
| Co-57 | 0.00e+00 | 1.79e+07 | 2.99e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.33e+08 |
| Co-58 | 0.00e+00 | 4.36e+07 | 1.00e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.01e+08 |
| Co-60 | 0.00e+00 | 2.49e+08 | 5.60e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.24e+09 |
| Ni-59 | 1.20e+09 | 4.24e+08 | 2.04e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.64e+07 |
| Ni-63 | 1.61e+10 | 1.13e+09 | 5.45e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.81e+08 |
| Ni-65 | 5.55e+01 | 7.09e+00 | 3.23e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.85e+02 |
| Cu-64 | 0.00e+00 | 8.29e+03 | 3.90e+03 | 0.00e+00 | 2.10e+04 | 0.00e+00 | 6.43e+05 |
| Zn-65 | 4.24e+08 | 1.47e+09 | 6.86e+08 | 0.00e+00 | 9.42e+08 | 0.00e+00 | 6.23e+08 |
| Zn-69 | 4.73e-06 | 9.02e-06 | 6.31e-07 | 0.00e+00 | 5.89e-06 | 0.00e+00 | 1.66e-05 |
| Zn-69m | 2.08e+04 | 4.90e+04 | 4.50e+03 | 0.00e+00 | 2.98e+04 | 0.00e+00 | 2.69e+06 |
| Se-79 | 0.00e+00 | 3.39e+08 | 5.70e+07 | 0.00e+00 | 5.91e+08 | 0.00e+00 | 5.18e+07 |
| Br-82 | 0.00e+00 | 0.00e+00 | 1.32e+06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-83 | 0.00e+00 | 0.00e+00 | 2.82e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-84 | 0.00e+00 | 0.00e+00 | 1.95e-11 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-85 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# LEAFY VEGETABLE PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Leafy/Produce Vegetation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Rb-86 | 0.00e+00 | 2.73e+08 | 1.28e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.05e+07 |
| Rb-87 | 0.00e+00 | 1.59e+09 | 5.55e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.55e+07 |
| Rb-88 | 0.00e+00 | 2.44e-22 | 1.30e-22 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.09e-29 |
| Rb-89 | 0.00e+00 | 2.59e-26 | 1.83e-26 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.98e-35 |
| Sr-89 | 1.51e+10 | 0.00e+00 | 4.33e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.80e+09 |
| Sr-90 | 9.22e+11 | 0.00e+00 | 1.84e+10 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.11e+10 |
| Sr-91 | 2.82e+05 | 0.00e+00 | 1.12e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.28e+06 |
| Sr-92 | 3.86e+02 | 0.00e+00 | 1.65e+01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 9.83e+03 |
| Y-90 | 1.24e+04 | 0.00e+00 | 3.34e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.02e+08 |
| Y-91 | 7.83e+06 | 0.00e+00 | 2.10e+05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.21e+09 |
| Y-91m | 4.43e-09 | 0.00e+00 | 1.69e-10 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.09e-07 |
| Y-92 | 8.42e-01 | 0.00e+00 | 2.43e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.31e+04 |
| Y-93 | 1.58e+02 | 0.00e+00 | 4.33e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.82e+06 |
| Zr-93 | 5.03e+06 | 2.48e+05 | 1.35e+05 | 0.00e+00 | 8.77e+05 | 0.00e+00 | 2.34e+08 |
| Zr-95 | 1.72e+06 | 5.43e+05 | 3.73e+05 | 0.00e+00 | 7.98e+05 | 0.00e+00 | 1.25e+09 |
| Zr-97 | 3.11e+02 | 6.15e+01 | 2.83e+01 | 0.00e+00 | 9.33e+01 | 0.00e+00 | 1.67e+07 |
| Nb-93m | 3.09e+06 | 1.02e+06 | 2.55e+05 | 0.00e+00 | 1.19e+06 | 0.00e+00 | 3.66e+08 |
| Nb-95 | 1.92e+05 | 1.07e+05 | 5.87e+04 | 0.00e+00 | 1.03e+05 | 0.00e+00 | 4.56e+08 |
| Nb-97 | 2.63e-06 | 6.54e-07 | 2.39e-07 | 0.00e+00 | 7.65e-07 | 0.00e+00 | 1.56e-02 |
| Mo-93 | 0.00e+00 | 9.63e+08 | 2.64e+07 | 0.00e+00 | 2.76e+08 | 0.00e+00 | 1.17e+08 |
| Mo-99 | 0.00e+00 | 5.64e+06 | 1.08e+06 | 0.00e+00 | 1.29e+07 | 0.00e+00 | 1.01e+07 |
| Tc-101 | 5.52e-31 | 7.85e-31 | 7.71e-30 | 0.00e+00 | 1.42e-29 | 4.78e-31 | 1.34e-37 |
| Tc-99 | 1.63e+07 | 2.39e+07 | 6.52e+06 | 0.00e+00 | 3.04e+08 | 2.47e+06 | 5.85e+08 |
| Tc-99m | 2.70e+00 | 7.54e+00 | 9.77e+01 | 0.00e+00 | 1.12e+02 | 4.18e+00 | 4.95e+03 |
| Ru-103 | 6.82e+06 | 0.00e+00 | 2.91e+06 | 0.00e+00 | 2.40e+07 | 0.00e+00 | 5.69e+08 |
| Ru-105 | 4.92e+01 | 0.00e+00 | 1.91e+01 | 0.00e+00 | 6.20e+02 | 0.00e+00 | 3.97e+04 |
| Ru-106 | 3.09e+08 | 0.00e+00 | 3.90e+07 | 0.00e+00 | 5.97e+08 | 0.00e+00 | 1.48e+10 |
| Rh-105 | 7.52e+04 | 5.43e+04 | 3.56e+04 | 0.00e+00 | 2.31e+05 | 0.00e+00 | 6.91e+06 |
| Pd-107 | 0.00e+00 | 1.89e+07 | 1.22e+06 | 0.00e+00 | 1.71e+08 | 0.00e+00 | 8.78e+07 |
| Pd-109 | 0.00e+00 | 2.07e+04 | 4.71e+03 | 0.00e+00 | 1.20e+05 | 0.00e+00 | 2.09e+06 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# LEAFY VEGETABLE PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Leafy/Produce Vegetation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ag-110m | 1.52e+07 | 1.43e+07 | 8.72e+06 | 0.00e+00 | 2.73e+07 | 0.00e+00 | 4.03e+09 |
| Ag-111 | 2.01e+05 | 8.35e+04 | 4.20e+04 | 0.00e+00 | 2.72e+05 | 0.00e+00 | 1.17e+08 |
| Cd-113m | 0.00e+00 | 4.06e+08 | 1.30e+07 | 0.00e+00 | 4.49e+08 | 0.00e+00 | 2.44e+09 |
| Cd-115m | 0.00e+00 | 7.94e+07 | 2.56e+06 | 0.00e+00 | 6.35e+07 | 0.00e+00 | 2.51e+09 |
| Sn-123 | 2.72e+09 | 4.46e+07 | 6.61e+07 | 3.57e+07 | 0.00e+00 | 0.00e+00 | 4.11e+09 |
| Sn-125 | 3.84e+07 | 7.65e+05 | 1.73e+06 | 6.01e+05 | 0.00e+00 | 0.00e+00 | 3.62e+08 |
| Sn-126 | 1.05e+10 | 1.96e+08 | 3.00e+08 | 5.17e+07 | 0.00e+00 | 0.00e+00 | 2.34e+09 |
| Sb-124 | 1.54e+08 | 2.84e+06 | 6.02e+07 | 3.50e+05 | 0.00e+00 | 1.35e+08 | 3.11e+09 |
| Sb-125 | 2.14e+08 | 2.34e+06 | 5.01e+07 | 2.05e+05 | 0.00e+00 | 1.88e+08 | 1.67e+09 |
| Sb-126 | 7.45e+06 | 1.52e+05 | 2.68e+06 | 4.21e+04 | 0.00e+00 | 5.34e+06 | 4.41e+08 |
| Sb-127 | 4.82e+05 | 1.03e+04 | 1.82e+05 | 5.42e+03 | 0.00e+00 | 3.28e+05 | 8.19e+07 |
| Te-125m | 1.48e+08 | 5.34e+07 | 1.98e+07 | 4.14e+07 | 0.00e+00 | 0.00e+00 | 4.37e+08 |
| Te-127 | 5.29e+03 | 1.88e+03 | 1.14e+03 | 3.65e+03 | 2.14e+04 | 0.00e+00 | 4.09e+05 |
| Te-127m | 5.51e+08 | 1.96e+08 | 6.56e+07 | 1.31e+08 | 2.23e+09 | 0.00e+00 | 1.37e+09 |
| Te-129 | 6.68e-04 | 2.49e-04 | 1.63e-04 | 4.77e-04 | 2.80e-03 | 0.00e+00 | 3.65e-03 |
| Te-129m | 3.61e+08 | 1.34e+08 | 5.72e+07 | 1.17e+08 | 1.51e+09 | 0.00e+00 | 1.36e+09 |
| Te-131 | 1.16e-15 | 4.78e-16 | 3.62e-16 | 8.93e-16 | 5.07e-15 | 0.00e+00 | 9.52e-17 |
| Te-131m | 8.42e+05 | 4.04e+05 | 3.37e+05 | 6.07e+05 | 4.21e+06 | 0.00e+00 | 3.24e+07 |
| Te-132 | 3.90e+06 | 2.47e+06 | 2.33e+06 | 2.61e+06 | 2.37e+07 | 0.00e+00 | 7.83e+07 |
| Te-133m | 1.94e-05 | 1.10e-05 | 1.07e-05 | 1.54e-05 | 1.09e-04 | 0.00e+00 | 4.45e-05 |
| Te-134 | 2.89e-08 | 1.85e-08 | 1.94e-08 | 2.37e-08 | 1.77e-07 | 0.00e+00 | 1.07e-09 |
| I-129 | 2.12e+09 | 1.78e+09 | 2.97e+09 | 2.17e+12 | 3.19e+09 | 0.00e+00 | 2.08e+08 |
| I-130 | 3.49e+05 | 1.01e+06 | 4.03e+05 | 8.22e+07 | 1.55e+06 | 0.00e+00 | 7.75e+05 |
| I-131 | 7.68e+07 | 1.08e+08 | 5.78e+07 | 3.14e+10 | 1.85e+08 | 0.00e+00 | 2.13e+07 |
| I-132 | 5.02e+01 | 1.31e+02 | 4.72e+01 | 4.43e+03 | 2.07e+02 | 0.00e+00 | 5.72e+01 |
| I-133 | 1.93e+06 | 3.27e+06 | 9.99e+05 | 4.57e+08 | 5.74e+06 | 0.00e+00 | 2.48e+06 |
| I-134 | 7.99e-05 | 2.12e-04 | 7.61e-05 | 3.53e-03 | 3.34e-04 | 0.00e+00 | 2.79e-06 |
| I-135 | 3.48e+04 | 8.96e+04 | 3.32e+04 | 5.76e+06 | 1.42e+05 | 0.00e+00 | 9.93e+04 |
| Cs-134 | 7.10e+09 | 1.67e+10 | 7.75e+09 | 0.00e+00 | 5.31e+09 | 2.03e+09 | 2.08e+08 |
| Cs-134m | 5.95e+00 | 1.23e+01 | 6.33e+00 | 0.00e+00 | 6.86e+00 | 1.20e+00 | 8.20e+00 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# LEAFY VEGETABLE PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Leafy/Produce Vegetation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Cs-135 | 2.53e+09 | 2.32e+09 | 5.42e+08 | 0.00e+00 | 8.84e+08 | 3.20e+08 | 4.05e+07 |
| Cs-136 | 4.37e+07 | 1.72e+08 | 1.15e+08 | 0.00e+00 | 9.36e+07 | 1.48e+07 | 1.38e+07 |
| Cs-137 | 1.01e+10 | 1.35e+10 | 4.69e+09 | 0.00e+00 | 4.59e+09 | 1.78e+09 | 1.92e+08 |
| Cs-138 | 3.13e-11 | 6.01e-11 | 3.00e-11 | 0.00e+00 | 4.44e-11 | 5.16e-12 | 2.73e-14 |
| Cs-139 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-139 | 2.54e-02 | 1.79e-05 | 7.40e-04 | 0.00e+00 | 1.69e-05 | 1.23e-05 | 2.27e-01 |
| Ba-140 | 1.38e+08 | 1.69e+05 | 8.89e+06 | 0.00e+00 | 5.73e+04 | 1.14e+05 | 2.13e+08 |
| Ba-141 | 8.36e-22 | 6.24e-25 | 2.79e-23 | 0.00e+00 | 5.79e-25 | 4.27e-25 | 1.78e-27 |
| Ba-142 | 3.57e-39 | 0.00e+00 | 2.20e-40 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| La-140 | 1.80e+03 | 8.86e+02 | 2.36e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.09e+07 |
| La-141 | 5.59e-01 | 1.72e-01 | 2.84e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.05e+04 |
| La-142 | 1.77e-04 | 7.84e-05 | 1.95e-05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.39e+00 |
| Ce-141 | 2.83e+05 | 1.89e+05 | 2.17e+04 | 0.00e+00 | 8.89e+04 | 0.00e+00 | 5.40e+08 |
| Ce-143 | 9.30e+02 | 6.77e+05 | 7.56e+01 | 0.00e+00 | 3.04e+02 | 0.00e+00 | 2.04e+07 |
| Ce-144 | 5.27e+07 | 2.18e+07 | 2.83e+06 | 0.00e+00 | 1.30e+07 | 0.00e+00 | 1.33e+10 |
| Pr-143 | 7.00e+04 | 2.79e+04 | 3.48e+03 | 0.00e+00 | 1.62e+04 | 0.00e+00 | 2.30e+08 |
| Pr-144 | 2.22e-26 | 9.07e-27 | 1.12e-27 | 0.00e+00 | 5.20e-27 | 0.00e+00 | 2.44e-29 |
| Nd-147 | 3.62e+04 | 3.93e+04 | 2.36e+03 | 0.00e+00 | 2.31e+04 | 0.00e+00 | 1.42e+08 |
| Pm-147 | 9.04e+06 | 8.57e+05 | 3.49e+05 | 0.00e+00 | 1.64e+06 | 0.00e+00 | 8.15e+08 |
| Pm-148 | 1.83e+04 | 2.98e+03 | 1.50e+03 | 0.00e+00 | 5.39e+03 | 0.00e+00 | 1.78e+08 |
| Pm-148m | 1.17e+06 | 2.96e+05 | 2.31e+05 | 0.00e+00 | 4.48e+05 | 0.00e+00 | 1.86e+09 |
| Pm-149 | 1.58e+03 | 2.23e+02 | 9.13e+01 | 0.00e+00 | 4.24e+02 | 0.00e+00 | 3.28e+07 |
| Pm-151 | 3.13e+02 | 5.16e+01 | 2.61e+01 | 0.00e+00 | 9.28e+01 | 0.00e+00 | 1.16e+07 |
| Sm-151 | 7.92e+06 | 1.52e+06 | 3.58e+05 | 0.00e+00 | 1.67e+06 | 0.00e+00 | 5.17e+08 |
| Sm-153 | 7.66e+02 | 6.34e+02 | 4.67e+01 | 0.00e+00 | 2.07e+02 | 0.00e+00 | 1.79e+07 |
| Eu-152 | 2.20e+07 | 5.30e+06 | 4.67e+06 | 0.00e+00 | 2.46e+07 | 0.00e+00 | 1.95e+09 |
| Eu-154 | 7.18e+07 | 9.26e+06 | 6.53e+06 | 0.00e+00 | 4.14e+07 | 0.00e+00 | 4.89e+09 |
| Eu-155 | 1.46e+07 | 1.41e+06 | 8.73e+05 | 0.00e+00 | 5.52e+06 | 0.00e+00 | 8.09e+09 |
| Eu-156 | 1.24e+05 | 9.31e+04 | 1.52e+04 | 0.00e+00 | 6.26e+04 | 0.00e+00 | 4.76e+08 |
| Tb-160 | 2.94e+06 | 0.00e+00 | 3.66e+05 | 0.00e+00 | 1.16e+06 | 0.00e+00 | 1.90e+09 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# LEAFY VEGETABLE PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Leafy/Produce Vegetation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ho-166m | 3.24e+07 | 1.00e+07 | 7.23e+06 | 0.00e+00 | 1.46e+07 | 0.00e+00 | 2.46e+09 |
| W-181 | 8.47e+05 | 2.73e+05 | 2.86e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.33e+07 |
| W-185 | 2.70e+07 | 8.90e+06 | 9.41e+05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.69e+08 |
| W-187 | 3.53e+04 | 2.87e+04 | 1.01e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.78e+06 |
| Pb-210 | 1.63e+12 | 4.91e+11 | 6.33e+10 | 0.00e+00 | 1.55e+12 | 0.00e+00 | 2.14e+08 |
| Bi-210 | 1.11e+06 | 7.61e+06 | 6.36e+05 | 0.00e+00 | 9.25e+07 | 0.00e+00 | 8.69e+07 |
| Po-210 | 3.19e+10 | 6.71e+10 | 7.72e+09 | 0.00e+00 | 2.26e+11 | 0.00e+00 | 4.24e+09 |
| Ra-223 | 2.90e+10 | 4.40e+07 | 5.78e+09 | 0.00e+00 | 1.26e+09 | 0.00e+00 | 1.40e+09 |
| Ra-224 | 2.90e+09 | 6.94e+06 | 5.80e+08 | 0.00e+00 | 1.99e+08 | 0.00e+00 | 4.66e+08 |
| Ra-225 | 5.79e+10 | 6.80e+07 | 1.16e+10 | 0.00e+00 | 1.95e+09 | 0.00e+00 | 2.02e+09 |
| Ra-226 | 2.93e+13 | 7.39e+08 | 2.17e+13 | 0.00e+00 | 2.11e+10 | 0.00e+00 | 3.19e+10 |
| Ra-228 | 1.21e+13 | 3.91e+08 | 1.34e+13 | 0.00e+00 | 1.12e+10 | 0.00e+00 | 5.30e+09 |
| Ac-225 | 2.13e+07 | 2.91e+07 | 1.43e+06 | 0.00e+00 | 3.34e+06 | 0.00e+00 | 1.48e+09 |
| Ac-227 | 1.85e+11 | 2.74e+10 | 1.10e+10 | 0.00e+00 | 7.95e+09 | 0.00e+00 | 7.84e+09 |
| Th-227 | 1.77e+08 | 3.18e+06 | 5.11e+06 | 0.00e+00 | 1.82e+07 | 0.00e+00 | 5.20e+09 |
| Th-228 | 5.74e+10 | 9.62e+08 | 1.94e+09 | 0.00e+00 | 5.41e+09 | 0.00e+00 | 5.04e+10 |
| Th-229 | 1.30e+12 | 3.74e+10 | 2.15e+10 | 0.00e+00 | 1.81e+11 | 0.00e+00 | 7.53e+09 |
| Th-230 | 1.96e+11 | 1.12e+10 | 5.45e+09 | 0.00e+00 | 5.44e+10 | 0.00e+00 | 5.80e+09 |
| Th-232 | 2.20e+11 | 9.54e+09 | 1.48e+08 | 0.00e+00 | 4.64e+10 | 0.00e+00 | 4.93e+09 |
| Th-234 | 1.59e+06 | 9.30e+04 | 4.61e+04 | 0.00e+00 | 5.30e+05 | 0.00e+00 | 1.68e+09 |
| Pa-231 | 3.92e+11 | 1.47e+10 | 1.53e+10 | 0.00e+00 | 8.27e+10 | 0.00e+00 | 6.91e+09 |
| Pa-233 | 1.24e+05 | 2.38e+04 | 2.12e+04 | 0.00e+00 | 8.96e+04 | 0.00e+00 | 2.71e+08 |
| U-232 | 5.34e+11 | 0.00e+00 | 3.82e+10 | 0.00e+00 | 5.79e+10 | 0.00e+00 | 6.52e+09 |
| U-233 | 1.13e+11 | 0.00e+00 | 6.85e+09 | 0.00e+00 | 2.64e+10 | 0.00e+00 | 6.04e+09 |
| U-234 | 1.08e+11 | 0.00e+00 | 6.72e+09 | 0.00e+00 | 2.59e+10 | 0.00e+00 | 5.92e+09 |
| U-235 | 1.04e+11 | 0.00e+00 | 6.31e+09 | 0.00e+00 | 2.43e+10 | 0.00e+00 | 7.53e+09 |
| U-236 | 1.04e+11 | 0.00e+00 | 6.44e+09 | 0.00e+00 | 2.48e+10 | 0.00e+00 | 5.55e+09 |
| U-237 | 1.74e+05 | 0.00e+00 | 4.64e+04 | 0.00e+00 | 7.16e+05 | 0.00e+00 | 4.62e+07 |
| U-238 | 9.91e+10 | 0.00e+00 | 5.90e+09 | 0.00e+00 | 2.27e+10 | 0.00e+00 | 5.30e+09 |
| Np-237 | 1.21e+11 | 8.68e+09 | 5.32e+09 | 0.00e+00 | 3.94e+10 | 0.00e+00 | 7.64e+09 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# LEAFY VEGETABLE PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Leafy/Produce Vegetation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Np-238 | 1.36e+04 | 3.63e+02 | 2.11e+02 | 0.00e+00 | 1.24e+03 | 0.00e+00 | 2.66e+07 |
| Np-239 | 1.38e+03 | 1.31e+02 | 7.25e+01 | 0.00e+00 | 4.10e+02 | 0.00e+00 | 2.10e+07 |
| Pu-238 | 6.08e+10 | 7.79e+09 | 1.65e+09 | 0.00e+00 | 7.08e+09 | 0.00e+00 | 7.01e+09 |
| Pu-239 | 6.95e+10 | 8.44e+09 | 1.83e+09 | 0.00e+00 | 7.79e+09 | 0.00e+00 | 6.42e+09 |
| Pu-240 | 6.94e+10 | 8.42e+09 | 1.83e+09 | 0.00e+00 | 7.78e+09 | 0.00e+00 | 6.53e+09 |
| Pu-241 | 1.58e+09 | 7.56e+07 | 3.32e+07 | 0.00e+00 | 1.54e+08 | 0.00e+00 | 1.33e+08 |
| Pu-242 | 6.44e+10 | 8.13e+09 | 1.76e+09 | 0.00e+00 | 7.50e+09 | 0.00e+00 | 6.29e+09 |
| Pu-244 | 7.53e+10 | 9.27e+09 | 2.02e+09 | 0.00e+00 | 8.59e+09 | 0.00e+00 | 9.36e+09 |
| Am-241 | 7.02e+10 | 6.62e+10 | 5.06e+09 | 0.00e+00 | 3.79e+10 | 0.00e+00 | 6.92e+09 |
| Am-242m | 7.33e+10 | 6.46e+10 | 5.27e+09 | 0.00e+00 | 3.90e+10 | 0.00e+00 | 8.99e+09 |
| Am-243 | 7.23e+10 | 6.68e+10 | 5.11e+09 | 0.00e+00 | 3.84e+10 | 0.00e+00 | 8.39e+09 |
| Cm-242 | 1.95e+09 | 2.06e+09 | 1.29e+08 | 0.00e+00 | 5.90e+08 | 0.00e+00 | 5.57e+09 |
| Cm-243 | 5.88e+10 | 5.45e+10 | 3.70e+09 | 0.00e+00 | 1.73e+10 | 0.00e+00 | 7.49e+09 |
| Cm-244 | 4.54e+10 | 4.30e+10 | 2.88e+09 | 0.00e+00 | 1.34e+10 | 0.00e+00 | 7.21e+09 |
| Cm-245 | 9.00e+10 | 7.92e+10 | 5.54e+09 | 0.00e+00 | 2.59e+10 | 0.00e+00 | 6.78e+09 |
| Cm-246 | 8.92e+10 | 7.91e+10 | 5.53e+09 | 0.00e+00 | 2.58e+10 | 0.00e+00 | 6.66e+09 |
| Cm-247 | 8.70e+10 | 7.79e+10 | 5.45e+09 | 0.00e+00 | 2.54e+10 | 0.00e+00 | 8.75e+09 |
| Cm-248 | 7.23e+11 | 6.42e+11 | 4.50e+10 | 0.00e+00 | 2.10e+11 | 0.00e+00 | 1.41e+11 |
| Cf-252 | 2.98e+10 | 0.00e+00 | 7.18e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.62e+10 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# LEAFY VEGETABLE PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Leafy/Produce Vegetation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| H-3 | 0.00e+00 | 2.29e+03 | 2.29e+03 | 2.29e+03 | 2.29e+03 | 2.29e+03 | 2.29e+03 |
| Be-10 | 9.92e+08 | 1.15e+08 | 2.49e+07 | 0.00e+00 | 8.16e+07 | 0.00e+00 | 2.02e+09 |
| C-14 | 8.89e+08 | 1.78e+08 | 1.78e+08 | 1.78e+08 | 1.78e+08 | 1.78e+08 | 1.78e+08 |
| N-13 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| F-18 | 6.90e+00 | 0.00e+00 | 6.84e-01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.87e+00 |
| Na-22 | 4.09e+09 | 4.09e+09 | 4.09e+09 | 4.09e+09 | 4.09e+09 | 4.09e+09 | 4.09e+09 |
| Na-24 | 3.71e+05 | 3.71e+05 | 3.71e+05 | 3.71e+05 | 3.71e+05 | 3.71e+05 | 3.71e+05 |
| P-32 | 3.37e+09 | 1.58e+08 | 1.30e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 9.30e+07 |
| Ca-41 | 2.55e+10 | 0.00e+00 | 2.79e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.40e+07 |
| Sc-46 | 7.85e+05 | 1.08e+06 | 4.14e+05 | 0.00e+00 | 9.52e+05 | 0.00e+00 | 1.57e+09 |
| Cr-51 | 0.00e+00 | 0.00e+00 | 1.17e+05 | 6.50e+04 | 1.78e+04 | 1.19e+05 | 6.21e+06 |
| Mn-54 | 0.00e+00 | 6.65e+08 | 1.77e+08 | 0.00e+00 | 1.86e+08 | 0.00e+00 | 5.58e+08 |
| Mn-56 | 0.00e+00 | 1.81e+01 | 4.08e+00 | 0.00e+00 | 2.19e+01 | 0.00e+00 | 2.62e+03 |
| Fe-55 | 8.01e+08 | 4.25e+08 | 1.32e+08 | 0.00e+00 | 0.00e+00 | 2.40e+08 | 7.87e+07 |
| Fe-59 | 3.97e+08 | 6.43e+08 | 3.20e+08 | 0.00e+00 | 0.00e+00 | 1.86e+08 | 6.69e+08 |
| Co-57 | 0.00e+00 | 2.98e+07 | 6.04e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.44e+08 |
| Co-58 | 0.00e+00 | 6.44e+07 | 1.97e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.75e+08 |
| Co-60 | 0.00e+00 | 3.78e+08 | 1.12e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.10e+09 |
| Ni-59 | 2.95e+09 | 7.86e+08 | 5.01e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.22e+07 |
| Ni-63 | 3.95e+10 | 2.11e+09 | 1.34e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.42e+08 |
| Ni-65 | 1.02e+02 | 9.59e+00 | 5.60e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.17e+03 |
| Cu-64 | 0.00e+00 | 1.09e+04 | 6.60e+03 | 0.00e+00 | 2.64e+04 | 0.00e+00 | 5.13e+05 |
| Zn-65 | 8.12e+08 | 2.16e+09 | 1.35e+09 | 0.00e+00 | 1.36e+09 | 0.00e+00 | 3.80e+08 |
| Zn-69 | 8.73e-06 | 1.26e-05 | 1.17e-06 | 0.00e+00 | 7.66e-06 | 0.00e+00 | 7.96e-04 |
| Zn-69m | 3.81e+04 | 6.49e+04 | 7.67e+03 | 0.00e+00 | 3.77e+04 | 0.00e+00 | 2.11e+06 |
| Se-79 | 0.00e+00 | 6.20e+08 | 1.37e+08 | 0.00e+00 | 1.01e+09 | 0.00e+00 | 4.06e+07 |
| Br-82 | 0.00e+00 | 0.00e+00 | 2.03e+06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-83 | 0.00e+00 | 0.00e+00 | 5.20e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-84 | 0.00e+00 | 0.00e+00 | 3.30e-11 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-85 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# LEAFY VEGETABLE PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Leafy/Produce Vegetation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Rb-86 | 0.00e+00 | 4.52e+08 | 2.78e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.90e+07 |
| Rb-87 | 0.00e+00 | 2.90e+09 | 1.35e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.35e+07 |
| Rb-88 | 0.00e+00 | 3.37e-22 | 2.34e-22 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.65e-23 |
| Rb-89 | 0.00e+00 | 3.42e-26 | 3.04e-26 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.98e-28 |
| Sr-89 | 3.59e+10 | 0.00e+00 | 1.03e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.39e+09 |
| Sr-90 | 1.87e+12 | 0.00e+00 | 3.77e+10 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.67e+10 |
| Sr-91 | 5.20e+05 | 0.00e+00 | 1.96e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.15e+06 |
| Sr-92 | 7.07e+02 | 0.00e+00 | 2.84e+01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.34e+04 |
| Y-90 | 2.30e+04 | 0.00e+00 | 6.17e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.56e+07 |
| Y-91 | 1.86e+07 | 0.00e+00 | 4.98e+05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.48e+09 |
| Y-91m | 8.12e-09 | 0.00e+00 | 2.95e-10 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.59e-05 |
| Y-92 | 1.55e+00 | 0.00e+00 | 4.43e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.48e+04 |
| Y-93 | 2.91e+02 | 0.00e+00 | 7.98e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.34e+06 |
| Zr-93 | 1.23e+07 | 4.59e+05 | 3.27e+05 | 0.00e+00 | 1.78e+06 | 0.00e+00 | 1.74e+08 |
| Zr-95 | 3.86e+06 | 8.48e+05 | 7.54e+05 | 0.00e+00 | 1.21e+06 | 0.00e+00 | 8.84e+08 |
| Zr-97 | 5.68e+02 | 8.20e+01 | 4.84e+01 | 0.00e+00 | 1.18e+02 | 0.00e+00 | 1.24e+07 |
| Nb-93m | 7.64e+06 | 1.91e+06 | 6.26e+05 | 0.00e+00 | 2.06e+06 | 0.00e+00 | 2.87e+08 |
| Nb-95 | 4.10e+05 | 1.60e+05 | 1.14e+05 | 0.00e+00 | 1.50e+05 | 0.00e+00 | 2.95e+08 |
| Nb-97 | 4.80e-06 | 8.68e-07 | 4.05e-07 | 0.00e+00 | 9.63e-07 | 0.00e+00 | 2.68e-01 |
| Mo-93 | 0.00e+00 | 1.77e+09 | 6.36e+07 | 0.00e+00 | 4.67e+08 | 0.00e+00 | 8.97e+07 |
| Mo-99 | 0.00e+00 | 7.70e+06 | 1.91e+06 | 0.00e+00 | 1.64e+07 | 0.00e+00 | 6.37e+06 |
| Tc-101 | 1.02e-30 | 1.06e-30 | 1.35e-29 | 0.00e+00 | 1.81e-29 | 5.62e-31 | 3.38e-30 |
| Tc-99 | 3.93e+07 | 4.38e+07 | 1.57e+07 | 0.00e+00 | 5.16e+08 | 3.87e+06 | 4.59e+08 |
| Tc-99m | 4.65e+00 | 9.12e+00 | 1.51e+02 | 0.00e+00 | 1.32e+02 | 4.63e+00 | 5.19e+03 |
| Ru-103 | 1.53e+07 | 0.00e+00 | 5.89e+06 | 0.00e+00 | 3.86e+07 | 0.00e+00 | 3.96e+08 |
| Ru-105 | 9.01e+01 | 0.00e+00 | 3.27e+01 | 0.00e+00 | 7.92e+02 | 0.00e+00 | 5.88e+04 |
| Ru-106 | 7.45e+08 | 0.00e+00 | 9.30e+07 | 0.00e+00 | 1.01e+09 | 0.00e+00 | 1.16e+10 |
| Rh-105 | 1.38e+05 | 7.43e+04 | 6.35e+04 | 0.00e+00 | 2.96e+05 | 0.00e+00 | 4.60e+06 |
| Pd-107 | 0.00e+00 | 3.47e+07 | 2.95e+06 | 0.00e+00 | 2.90e+08 | 0.00e+00 | 6.89e+07 |
| Pd-109 | 0.00e+00 | 2.90e+04 | 8.69e+03 | 0.00e+00 | 1.55e+05 | 0.00e+00 | 1.71e+06 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# LEAFY VEGETABLE PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Leafy/Produce Vegetation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ag-110m | 3.21e+07 | 2.17e+07 | 1.73e+07 | 0.00e+00 | 4.04e+07 | 0.00e+00 | 2.58e+09 |
| Ag-111 | 3.78e+05 | 1.18e+05 | 7.81e+04 | 0.00e+00 | 3.57e+05 | 0.00e+00 | 7.25e+07 |
| Cd-113m | 0.00e+00 | 7.42e+08 | 3.16e+07 | 0.00e+00 | 7.64e+08 | 0.00e+00 | 1.91e+09 |
| Cd-115m | 0.00e+00 | 1.42e+08 | 6.04e+06 | 0.00e+00 | 1.05e+08 | 0.00e+00 | 1.93e+09 |
| Sn-123 | 6.54e+09 | 8.11e+07 | 1.59e+08 | 8.60e+07 | 0.00e+00 | 0.00e+00 | 3.20e+09 |
| Sn-125 | 7.43e+07 | 1.12e+06 | 3.33e+06 | 1.16e+06 | 0.00e+00 | 0.00e+00 | 2.30e+08 |
| Sn-126 | 2.45e+10 | 3.05e+08 | 6.95e+08 | 8.38e+07 | 0.00e+00 | 0.00e+00 | 1.84e+09 |
| Sb-124 | 3.52e+08 | 4.56e+06 | 1.23e+08 | 7.76e+05 | 0.00e+00 | 1.95e+08 | 2.20e+09 |
| Sb-125 | 4.99e+08 | 3.85e+06 | 1.05e+08 | 4.62e+05 | 0.00e+00 | 2.78e+08 | 1.19e+09 |
| Sb-126 | 1.40e+07 | 2.15e+05 | 5.04e+06 | 8.24e+04 | 0.00e+00 | 6.70e+06 | 2.83e+08 |
| Sb-127 | 8.72e+05 | 1.35e+04 | 3.03e+05 | 9.71e+03 | 0.00e+00 | 3.78e+05 | 4.91e+07 |
| Te-125m | 3.50e+08 | 9.50e+07 | 4.67e+07 | 9.83e+07 | 0.00e+00 | 0.00e+00 | 3.38e+08 |
| Te-127 | 9.76e+03 | 2.63e+03 | 2.09e+03 | 6.76e+03 | 2.78e+04 | 0.00e+00 | 3.81e+05 |
| Te-127m | 1.32e+09 | 3.56e+08 | 1.57e+08 | 3.16e+08 | 3.77e+09 | 0.00e+00 | 1.07e+09 |
| Te-129 | 1.24e-03 | 3.45e-04 | 2.94e-04 | 8.82e-04 | 3.62e-03 | 0.00e+00 | 7.70e-02 |
| Te-129m | 8.40e+08 | 2.35e+08 | 1.30e+08 | 2.71e+08 | 2.47e+09 | 0.00e+00 | 1.03e+09 |
| Te-131 | 2.14e-15 | 6.51e-16 | 6.35e-16 | 1.63e-15 | 6.46e-15 | 0.00e+00 | 1.12e-14 |
| Te-131m | 1.54e+06 | 5.32e+05 | 5.66e+05 | 1.09e+06 | 5.15e+06 | 0.00e+00 | 2.16e+07 |
| Te-132 | 6.99e+06 | 3.10e+06 | 3.74e+06 | 4.51e+06 | 2.87e+07 | 0.00e+00 | 3.12e+07 |
| Te-133m | 3.48e-05 | 1.41e-05 | 1.74e-05 | 2.70e-05 | 1.34e-04 | 0.00e+00 | 1.07e-03 |
| Te-134 | 5.16e-08 | 2.32e-08 | 3.10e-08 | 4.08e-08 | 2.15e-07 | 0.00e+00 | 2.36e-07 |
| I-129 | 5.11e+09 | 3.13e+09 | 2.80e+09 | 2.05e+12 | 5.29e+09 | 0.00e+00 | 1.58e+08 |
| I-130 | 6.12e+05 | 1.24e+06 | 6.37e+05 | 1.36e+08 | 1.85e+06 | 0.00e+00 | 5.78e+05 |
| I-131 | 1.43e+08 | 1.44e+08 | 8.16e+07 | 4.75e+10 | 2.36e+08 | 0.00e+00 | 1.28e+07 |
| I-132 | 8.91e+01 | 1.64e+02 | 7.53e+01 | 7.60e+03 | 2.51e+02 | 0.00e+00 | 1.93e+02 |
| I-133 | 3.52e+06 | 4.35e+06 | 1.65e+06 | 8.08e+08 | 7.25e+06 | 0.00e+00 | 1.75e+06 |
| I-134 | 1.42e-04 | 2.64e-04 | 1.21e-04 | 6.07e-03 | 4.03e-04 | 0.00e+00 | 1.75e-04 |
| I-135 | 6.18e+04 | 1.11e+05 | 5.26e+04 | 9.86e+06 | 1.71e+05 | 0.00e+00 | 8.48e+04 |
| Cs-134 | 1.60e+10 | 2.63e+10 | 5.55e+09 | 0.00e+00 | 8.15e+09 | 2.93e+09 | 1.42e+08 |
| Cs-134m | 1.06e+01 | 1.57e+01 | 1.02e+01 | 0.00e+00 | 8.26e+00 | 1.37e+00 | 1.98e+01 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# LEAFY VEGETABLE PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Leafy/Produce Vegetation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Cs-135 | 6.10e+09 | 4.25e+09 | 4.36e+08 | 0.00e+00 | 1.50e+09 | 5.01e+08 | 3.18e+07 |
| Cs-136 | 8.23e+07 | 2.26e+08 | 1.46e+08 | 0.00e+00 | 1.21e+08 | 1.80e+07 | 7.95e+06 |
| Cs-137 | 2.39e+10 | 2.29e+10 | 3.38e+09 | 0.00e+00 | 7.46e+09 | 2.68e+09 | 1.43e+08 |
| Cs-138 | 5.69e-11 | 7.91e-11 | 5.02e-11 | 0.00e+00 | 5.57e-11 | 5.99e-12 | 3.64e-11 |
| Cs-139 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-139 | 4.69e-02 | 2.50e-05 | 1.36e-03 | 0.00e+00 | 2.18e-05 | 1.47e-05 | 2.70e+00 |
| Ba-140 | 2.76e+08 | 2.42e+05 | 1.61e+07 | 0.00e+00 | 7.88e+04 | 1.44e+05 | 1.40e+08 |
| Ba-141 | 1.54e-21 | 8.64e-25 | 5.02e-23 | 0.00e+00 | 7.47e-25 | 5.07e-24 | 8.79e-22 |
| Ba-142 | 6.46e-39 | 0.00e+00 | 3.61e-40 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| La-140 | 3.24e+03 | 1.13e+03 | 3.82e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.16e+07 |
| La-141 | 1.04e+00 | 2.41e-01 | 5.24e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.37e+04 |
| La-142 | 3.20e-04 | 1.02e-04 | 3.19e-05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.02e+01 |
| Ce-141 | 6.55e+05 | 3.27e+05 | 4.85e+04 | 0.00e+00 | 1.43e+05 | 0.00e+00 | 4.08e+08 |
| Ce-143 | 1.71e+03 | 9.29e+05 | 1.35e+02 | 0.00e+00 | 3.90e+02 | 0.00e+00 | 1.36e+07 |
| Ce-144 | 1.27e+08 | 3.98e+07 | 6.78e+06 | 0.00e+00 | 2.21e+07 | 0.00e+00 | 1.04e+10 |
| Pr-143 | 1.45e+05 | 4.37e+04 | 7.22e+03 | 0.00e+00 | 2.36e+04 | 0.00e+00 | 1.57e+08 |
| Pr-144 | 4.11e-26 | 1.27e-26 | 2.07e-27 | 0.00e+00 | 6.73e-27 | 0.00e+00 | 2.74e-23 |
| Nd-147 | 7.14e+04 | 5.78e+04 | 4.48e+03 | 0.00e+00 | 3.17e+04 | 0.00e+00 | 9.16e+07 |
| Pm-147 | 2.21e+07 | 1.58e+06 | 8.48e+05 | 0.00e+00 | 2.79e+06 | 0.00e+00 | 6.39e+08 |
| Pm-148 | 3.36e+04 | 4.04e+03 | 2.62e+03 | 0.00e+00 | 6.87e+03 | 0.00e+00 | 1.08e+08 |
| Pm-148m | 2.28e+06 | 4.54e+05 | 4.54e+05 | 0.00e+00 | 6.73e+05 | 0.00e+00 | 1.28e+09 |
| Pm-149 | 2.93e+03 | 3.12e+02 | 1.69e+02 | 0.00e+00 | 5.52e+02 | 0.00e+00 | 2.13e+07 |
| Pm-151 | 5.72e+02 | 6.96e+01 | 4.53e+01 | 0.00e+00 | 1.18e+02 | 0.00e+00 | 7.90e+06 |
| Sm-151 | 1.88e+07 | 2.80e+06 | 8.81e+05 | 0.00e+00 | 2.89e+06 | 0.00e+00 | 4.06e+08 |
| Sm-153 | 1.42e+03 | 8.83e+02 | 8.51e+01 | 0.00e+00 | 2.69e+02 | 0.00e+00 | 1.17e+07 |
| Eu-152 | 4.47e+07 | 8.14e+06 | 9.66e+06 | 0.00e+00 | 3.44e+07 | 0.00e+00 | 1.34e+09 |
| Eu-154 | 1.69e+08 | 1.52e+07 | 1.39e+07 | 0.00e+00 | 6.68e+07 | 0.00e+00 | 3.53e+09 |
| Eu-155 | 3.27e+07 | 2.35e+06 | 1.84e+06 | 0.00e+00 | 8.82e+06 | 0.00e+00 | 5.89e+09 |
| Eu-156 | 2.58e+05 | 1.38e+05 | 2.86e+04 | 0.00e+00 | 8.89e+04 | 0.00e+00 | 3.13e+08 |
| Tb-160 | 6.01e+06 | 0.00e+00 | 7.46e+05 | 0.00e+00 | 1.79e+06 | 0.00e+00 | 1.33e+09 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# LEAFY VEGETABLE PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Leafy/Produce Vegetation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ho-166m | 7.94e+07 | 1.66e+07 | 1.40e+07 | 0.00e+00 | 2.37e+07 | 0.00e+00 | 1.93e+09 |
| W-181 | 2.03e+06 | 4.98e+05 | 6.85e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.81e+07 |
| W-185 | 6.44e+07 | 1.61e+07 | 2.25e+06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.99e+08 |
| W-187 | 6.41e+04 | 3.80e+04 | 1.70e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.34e+06 |
| Pb-210 | 3.47e+12 | 8.90e+11 | 1.53e+11 | 0.00e+00 | 2.68e+12 | 0.00e+00 | 1.68e+08 |
| Bi-210 | 2.06e+06 | 1.07e+07 | 1.18e+06 | 0.00e+00 | 1.20e+08 | 0.00e+00 | 5.41e+07 |
| Po-210 | 7.66e+10 | 1.23e+11 | 1.85e+10 | 0.00e+00 | 3.81e+11 | 0.00e+00 | 3.30e+09 |
| Ra-223 | 5.77e+10 | 6.67e+07 | 1.15e+10 | 0.00e+00 | 1.77e+09 | 0.00e+00 | 9.20e+08 |
| Ra-224 | 5.36e+09 | 9.73e+06 | 1.07e+09 | 0.00e+00 | 2.58e+08 | 0.00e+00 | 2.94e+08 |
| Ra-225 | 1.22e+11 | 1.09e+08 | 2.44e+10 | 0.00e+00 | 2.89e+09 | 0.00e+00 | 1.40e+09 |
| Ra-226 | 4.23e+13 | 1.35e+09 | 3.47e+13 | 0.00e+00 | 3.59e+10 | 0.00e+00 | 2.51e+10 |
| Ra-228 | 2.76e+13 | 7.16e+08 | 3.10e+13 | 0.00e+00 | 1.90e+10 | 0.00e+00 | 4.16e+09 |
| Ac-225 | 4.16e+07 | 4.29e+07 | 2.79e+06 | 0.00e+00 | 4.58e+06 | 0.00e+00 | 9.54e+08 |
| Ac-227 | 3.01e+11 | 4.84e+10 | 1.86e+10 | 0.00e+00 | 1.07e+10 | 0.00e+00 | 6.16e+09 |
| Th-227 | 3.88e+08 | 5.28e+06 | 1.12e+07 | 0.00e+00 | 2.80e+07 | 0.00e+00 | 3.73e+09 |
| Th-228 | 1.41e+11 | 1.81e+09 | 4.77e+09 | 0.00e+00 | 9.40e+09 | 0.00e+00 | 3.95e+10 |
| Th-229 | 1.73e+12 | 4.34e+10 | 2.88e+10 | 0.00e+00 | 2.12e+11 | 0.00e+00 | 5.91e+09 |
| Th-230 | 2.61e+11 | 1.31e+10 | 7.28e+09 | 0.00e+00 | 6.37e+10 | 0.00e+00 | 4.55e+09 |
| Th-232 | 2.91e+11 | 1.12e+10 | 2.21e+08 | 0.00e+00 | 5.45e+10 | 0.00e+00 | 3.87e+09 |
| Th-234 | 3.61e+06 | 1.59e+05 | 1.04e+05 | 0.00e+00 | 8.46e+05 | 0.00e+00 | 1.25e+09 |
| Pa-231 | 5.20e+11 | 1.72e+10 | 2.07e+10 | 0.00e+00 | 9.41e+10 | 0.00e+00 | 5.42e+09 |
| Pa-233 | 2.34e+05 | 3.65e+04 | 4.09e+04 | 0.00e+00 | 1.34e+05 | 0.00e+00 | 1.86e+08 |
| U-232 | 1.29e+12 | 0.00e+00 | 9.24e+10 | 0.00e+00 | 9.83e+10 | 0.00e+00 | 5.12e+09 |
| U-233 | 2.73e+11 | 0.00e+00 | 1.65e+10 | 0.00e+00 | 4.48e+10 | 0.00e+00 | 4.74e+09 |
| U-234 | 2.62e+11 | 0.00e+00 | 1.62e+10 | 0.00e+00 | 4.40e+10 | 0.00e+00 | 4.65e+09 |
| U-235 | 2.51e+11 | 0.00e+00 | 1.52e+10 | 0.00e+00 | 4.12e+10 | 0.00e+00 | 5.90e+09 |
| U-236 | 2.51e+11 | 0.00e+00 | 1.56e+10 | 0.00e+00 | 4.21e+10 | 0.00e+00 | 4.35e+09 |
| U-237 | 3.26e+05 | 0.00e+00 | 8.65e+04 | 0.00e+00 | 9.39e+05 | 0.00e+00 | 2.87e+07 |
| U-238 | 2.40e+11 | 0.00e+00 | 1.43e+10 | 0.00e+00 | 3.85e+10 | 0.00e+00 | 4.16e+09 |
| Np-237 | 1.64e+11 | 1.08e+10 | 7.20e+09 | 0.00e+00 | 4.45e+10 | 0.00e+00 | 6.00e+09 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# LEAFY VEGETABLE PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Leafy/Produce Vegetation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Np-238 | 2.51e+04 | 5.08e+02 | 3.91e+02 | 0.00e+00 | 1.62e+03 | 0.00e+00 | 1.74e+07 |
| Np-239 | 2.56e+03 | 1.84e+02 | 1.29e+02 | 0.00e+00 | 5.31e+02 | 0.00e+00 | 1.36e+07 |
| Pu-238 | 8.73e+10 | 1.01e+10 | 2.32e+09 | 0.00e+00 | 8.44e+09 | 0.00e+00 | 5.50e+09 |
| Pu-239 | 9.48e+10 | 1.01e+10 | 2.43e+09 | 0.00e+00 | 8.97e+09 | 0.00e+00 | 5.03e+09 |
| Pu-240 | 9.41e+10 | 1.05e+10 | 2.43e+09 | 0.00e+00 | 8.97e+09 | 0.00e+00 | 5.13e+09 |
| Pu-241 | 2.82e+09 | 1.15e+08 | 5.85e+07 | 0.00e+00 | 2.15e+08 | 0.00e+00 | 1.05e+08 |
| Pu-242 | 8.75e+10 | 1.01e+10 | 2.34e+09 | 0.00e+00 | 8.60e+09 | 0.00e+00 | 4.93e+09 |
| Pu-244 | 1.02e+11 | 1.16e+11 | 2.68e+09 | 0.00e+00 | 9.92e+09 | 0.00e+00 | 7.35e+09 |
| Am-241 | 9.67e+10 | 8.32e+10 | 7.25e+09 | 0.00e+00 | 4.43e+10 | 0.00e+00 | 5.43e+09 |
| Am-242m | 1.03e+11 | 8.22e+10 | 7.64e+09 | 0.00e+00 | 4.63e+10 | 0.00e+00 | 7.06e+09 |
| Am-243 | 9.85e+10 | 8.31e+10 | 7.23e+09 | 0.00e+00 | 4.45e+10 | 0.00e+00 | 6.58e+09 |
| Cm-242 | 4.69e+09 | 3.74e+09 | 3.12e+08 | 0.00e+00 | 9.98e+08 | 0.00e+00 | 4.35e+09 |
| Cm-243 | 9.36e+10 | 7.61e+10 | 6.03e+09 | 0.00e+00 | 2.25e+10 | 0.00e+00 | 5.87e+09 |
| Cm-244 | 7.87e+10 | 6.37e+10 | 5.05e+09 | 0.00e+00 | 1.85e+10 | 0.00e+00 | 5.67e+09 |
| Cm-245 | 1.23e+11 | 9.85e+10 | 7.72e+09 | 0.00e+00 | 3.02e+10 | 0.00e+00 | 5.32e+09 |
| Cm-246 | 1.21e+11 | 9.85e+10 | 7.72e+09 | 0.00e+00 | 3.01e+10 | 0.00e+00 | 5.23e+09 |
| Cm-247 | 1.18e+11 | 9.70e+10 | 7.57e+09 | 0.00e+00 | 2.97e+10 | 0.00e+00 | 6.87e+09 |
| Cm-248 | 9.85e+11 | 8.01e+11 | 6.26e+10 | 0.00e+00 | 2.45e+11 | 0.00e+00 | 1.11e+11 |
| Cf-252 | 7.28e+10 | 0.00e+00 | 1.76e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.05e+10 |

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# LEAFY VEGETABLE PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Leafy/Produce Vegetation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| H-3 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Be-10 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| C-14 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| N-13 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| F-18 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Na-22 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Na-24 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| P-32 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ca-41 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sc-46 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cr-51 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Mn-54 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Mn-56 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Fe-55 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Fe-59 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Co-57 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Co-58 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Co-60 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ni-59 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ni-63 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ni-65 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cu-64 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Zn-65 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Zn-69 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Zn-69m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Se-79 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-82 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-83 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-84 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-85 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

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# LEAFY VEGETABLE PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Leafy/Produce Vegetation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Rb-86 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Rb-87 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Rb-88 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Rb-89 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sr-89 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sr-90 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sr-91 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sr-92 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Y-90 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Y-91 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Y-91m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Y-92 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Y-93 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Zr-93 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Zr-95 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Zr-97 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Nb-93m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Nb-95 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Nb-97 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Mo-93 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Mo-99 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Tc-101 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Tc-99 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Tc-99m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ru-103 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ru-105 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ru-106 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Rh-105 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Pd-107 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Pd-109 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

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Ri factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Leafy/Produce Vegetation Pathway Ri

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|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ag-110m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ag-111 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cd-113m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cd-115m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sn-123 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sn-125 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sn-126 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sb-124 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sb-125 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sb-126 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sb-127 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Te-125m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Te-127 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Te-127m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Te-129 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Te-129m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Te-131 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Te-131m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Te-132 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Te-133m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Te-134 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| I-129 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| I-130 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| I-131 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| I-132 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| I-133 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| I-134 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| I-135 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cs-134 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cs-134m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# LEAFY VEGETABLE PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Leafy/Produce Vegetation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Cs-135 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cs-136 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cs-137 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cs-138 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cs-139 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-139 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-140 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-141 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-142 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| La-140 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| La-141 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| La-142 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ce-141 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ce-143 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ce-144 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Pr-143 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Pr-144 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Nd-147 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Pm-147 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Pm-148 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Pm-148m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Pm-149 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Pm-151 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sm-151 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sm-153 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Eu-152 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Eu-154 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Eu-155 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Eu-156 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Tb-160 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

Ri factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Leafy/Produce Vegetation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ho-166m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| W-181 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| W-185 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| W-187 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Pb-210 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Bi-210 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Po-210 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ra-223 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ra-224 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ra-225 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ra-226 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ra-228 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ac-225 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ac-227 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Th-227 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Th-228 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Th-229 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Th-230 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Th-232 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Th-234 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Pa-231 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Pa-233 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| U-232 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| U-233 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| U-234 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| U-235 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| U-236 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| U-237 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| U-238 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Np-237 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# LEAFY VEGETABLE PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Leafy/Produce Vegetation Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Np-238 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Np-239 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Pu-238 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Pu-239 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Pu-240 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Pu-241 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Pu-242 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Pu-244 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Am-241 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Am-242m | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Am-243 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cm-242 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cm-243 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cm-244 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cm-245 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cm-246 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cm-247 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cm-248 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Cf-252 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# GOAT's MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Goat's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| H-3 | 0.00e+00 | 8.88e+02 | 8.88e+02 | 8.88e+02 | 8.88e+02 | 8.88e+02 | 8.88e+02 |
| Be-10 | 2.95e+05 | 4.55e+04 | 7.36e+03 | 0.00e+00 | 3.44e+04 | 0.00e+00 | 2.49e+06 |
| C-14 | 2.63e+08 | 5.27e+07 | 5.27e+07 | 5.27e+07 | 5.27e+07 | 5.27e+07 | 5.27e+07 |
| N-13 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| F-18 | 5.58e-04 | 0.00e+00 | 6.19e-05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.65e-05 |
| Na-22 | 6.35e+08 | 6.35e+08 | 6.35e+08 | 6.35e+08 | 6.35e+08 | 6.35e+08 | 6.35e+08 |
| Na-24 | 2.93e+05 | 2.93e+05 | 2.93e+05 | 2.93e+05 | 2.93e+05 | 2.93e+05 | 2.93e+05 |
| P-32 | 2.05e+10 | 1.28e+09 | 7.93e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.31e+09 |
| Ca-41 | 1.37e+09 | 0.00e+00 | 1.48e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.37e+06 |
| Sc-46 | 2.15e+01 | 4.18e+01 | 1.22e+01 | 0.00e+00 | 3.90e+01 | 0.00e+00 | 2.04e+05 |
| Cr-51 | 0.00e+00 | 0.00e+00 | 3.43e+03 | 2.05e+03 | 7.55e+02 | 4.55e+03 | 8.62e+05 |
| Mn-54 | 0.00e+00 | 1.01e+06 | 1.93e+05 | 0.00e+00 | 3.00e+05 | 0.00e+00 | 3.09e+06 |
| Mn-56 | 0.00e+00 | 4.98e-04 | 8.84e-05 | 0.00e+00 | 6.33e-04 | 0.00e+00 | 1.59e-02 |
| Fe-55 | 3.26e+05 | 2.26e+05 | 5.26e+04 | 0.00e+00 | 0.00e+00 | 1.26e+05 | 1.29e+05 |
| Fe-59 | 3.86e+05 | 9.07e+05 | 3.48e+05 | 0.00e+00 | 0.00e+00 | 2.54e+05 | 3.02e+06 |
| Co-57 | 0.00e+00 | 1.54e+05 | 2.55e+05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.89e+06 |
| Co-58 | 0.00e+00 | 5.66e+05 | 1.27e+06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.15e+07 |
| Co-60 | 0.00e+00 | 1.97e+06 | 4.34e+06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.70e+07 |
| Ni-59 | 6.06e+07 | 2.08e+07 | 1.01e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.29e+06 |
| Ni-63 | 8.07e+08 | 5.60e+07 | 2.71e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.17e+07 |
| Ni-65 | 4.51e-02 | 5.86e-03 | 2.67e-03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.49e-01 |
| Cu-64 | 0.00e+00 | 2.66e+03 | 1.25e+03 | 0.00e+00 | 6.72e+03 | 0.00e+00 | 2.27e+05 |
| Zn-65 | 1.65e+08 | 5.24e+08 | 2.37e+08 | 0.00e+00 | 3.50e+08 | 0.00e+00 | 3.30e+08 |
| Zn-69 | 2.62e-13 | 5.00e-13 | 3.48e-14 | 0.00e+00 | 3.25e-13 | 0.00e+00 | 7.52e-14 |
| Zn-69m | 2.18e+04 | 5.22e+04 | 4.78e+03 | 0.00e+00 | 3.16e+04 | 0.00e+00 | 3.19e+06 |
| Se-79 | 0.00e+00 | 1.10e+08 | 1.83e+07 | 0.00e+00 | 1.90e+08 | 0.00e+00 | 2.25e+07 |
| Br-82 | 0.00e+00 | 0.00e+00 | 3.88e+06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.44e+06 |
| Br-83 | 0.00e+00 | 0.00e+00 | 1.18e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.71e-02 |
| Br-84 | 0.00e+00 | 0.00e+00 | 2.08e-24 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.63e-29 |
| Br-85 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# GOAT's MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Goat's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Rb-86 | 0.00e+00 | 3.11e+08 | 1.45e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.14e+07 |
| Rb-87 | 0.00e+00 | 3.42e+08 | 1.19e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.60e+07 |
| Rb-88 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Rb-89 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sr-89 | 3.05e+09 | 0.00e+00 | 8.74e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.89e+08 |
| Sr-90 | 1.13e+11 | 0.00e+00 | 2.27e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.84e+09 |
| Sr-91 | 6.10e+04 | 0.00e+00 | 2.46e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.90e+05 |
| Sr-92 | 1.04e+00 | 0.00e+00 | 4.50e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.06e+01 |
| Y-90 | 8.51e+00 | 0.00e+00 | 2.28e-01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 9.02e+04 |
| Y-91 | 1.03e+03 | 0.00e+00 | 2.76e+01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.67e+05 |
| Y-91m | 7.52e-21 | 0.00e+00 | 2.91e-22 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.21e-20 |
| Y-92 | 6.77e-06 | 0.00e+00 | 1.98e-07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.19e-01 |
| Y-93 | 2.69e-02 | 0.00e+00 | 7.43e-04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 8.53e+02 |
| Zr-93 | 1.94e+02 | 1.09e+01 | 5.05e+00 | 0.00e+00 | 4.11e+01 | 0.00e+00 | 1.13e+04 |
| Zr-95 | 1.13e+02 | 3.63e+01 | 2.46e+01 | 0.00e+00 | 5.70e+01 | 0.00e+00 | 1.15e+05 |
| Zr-97 | 5.21e-02 | 1.05e-02 | 4.81e-03 | 0.00e+00 | 1.59e-02 | 0.00e+00 | 3.26e+03 |
| Nb-93m | 5.89e+04 | 1.92e+04 | 4.74e+03 | 0.00e+00 | 2.21e+04 | 0.00e+00 | 8.88e+06 |
| Nb-95 | 9.91e+03 | 5.51e+03 | 2.96e+03 | 0.00e+00 | 5.45e+03 | 0.00e+00 | 3.34e+07 |
| Nb-97 | 7.89e-13 | 2.00e-13 | 7.29e-14 | 0.00e+00 | 2.33e-13 | 0.00e+00 | 7.37e-10 |
| Mo-93 | 0.00e+00 | 5.22e+07 | 1.41e+06 | 0.00e+00 | 1.48e+07 | 0.00e+00 | 8.49e+06 |
| Mo-99 | 0.00e+00 | 2.97e+06 | 5.66e+05 | 0.00e+00 | 6.73e+06 | 0.00e+00 | 6.89e+06 |
| Tc-101 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Tc-99 | 2.90e+06 | 4.31e+06 | 1.16e+06 | 0.00e+00 | 5.43e+07 | 3.66e+05 | 1.41e+08 |
| Tc-99m | 4.01e-01 | 1.13e+00 | 1.44e+01 | 0.00e+00 | 1.72e+01 | 5.55e-01 | 6.71e+02 |
| Ru-103 | 1.22e+02 | 0.00e+00 | 5.26e+01 | 0.00e+00 | 4.66e+02 | 0.00e+00 | 1.43e+04 |
| Ru-105 | 1.04e-04 | 0.00e+00 | 4.09e-05 | 0.00e+00 | 1.34e-03 | 0.00e+00 | 6.34e-02 |
| Ru-106 | 2.45e+03 | 0.00e+00 | 3.10e+02 | 0.00e+00 | 4.73e+03 | 0.00e+00 | 1.58e+05 |
| Rh-105 | 4.15e+04 | 3.04e+04 | 2.00e+04 | 0.00e+00 | 1.29e+05 | 0.00e+00 | 4.84e+06 |
| Pd-107 | 0.00e+00 | 1.36e+06 | 8.72e+04 | 0.00e+00 | 1.22e+07 | 0.00e+00 | 8.45e+06 |
| Pd-109 | 0.00e+00 | 5.39e+03 | 1.22e+03 | 0.00e+00 | 3.08e+04 | 0.00e+00 | 5.97e+05 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

Ri factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Goat's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ag-110m | 6.99e+06 | 6.46e+06 | 3.84e+06 | 0.00e+00 | 1.27e+07 | 0.00e+00 | 2.64e+09 |
| Ag-111 | 7.77e+05 | 3.25e+05 | 1.62e+05 | 0.00e+00 | 1.05e+06 | 0.00e+00 | 5.96e+08 |
| Cd-113m | 0.00e+00 | 3.53e+05 | 1.13e+04 | 0.00e+00 | 3.88e+05 | 0.00e+00 | 2.84e+06 |
| Cd-115m | 0.00e+00 | 1.51e+05 | 4.82e+03 | 0.00e+00 | 1.20e+05 | 0.00e+00 | 6.36e+06 |
| Sn-123 | 6.43e+07 | 1.07e+06 | 1.57e+06 | 9.06e+05 | 0.00e+00 | 0.00e+00 | 1.31e+08 |
| Sn-125 | 6.81e+06 | 1.37e+05 | 3.09e+05 | 1.14e+05 | 0.00e+00 | 0.00e+00 | 8.50e+07 |
| Sn-126 | 1.96e+08 | 3.87e+06 | 5.56e+06 | 1.14e+06 | 0.00e+00 | 0.00e+00 | 5.63e+07 |
| Sb-124 | 3.09e+06 | 5.83e+04 | 1.22e+06 | 7.49e+03 | 0.00e+00 | 2.40e+06 | 8.77e+07 |
| Sb-125 | 2.45e+06 | 2.74e+04 | 5.84e+05 | 2.49e+03 | 0.00e+00 | 1.89e+06 | 2.70e+07 |
| Sb-126 | 6.75e+05 | 1.37e+04 | 2.44e+05 | 4.13e+03 | 0.00e+00 | 4.14e+05 | 5.52e+07 |
| Sb-127 | 5.44e+04 | 1.19e+03 | 2.09e+04 | 6.54e+02 | 0.00e+00 | 3.23e+04 | 1.24e+07 |
| Te-125m | 1.95e+06 | 7.08e+05 | 2.62e+05 | 5.88e+05 | 7.95e+06 | 0.00e+00 | 7.80e+06 |
| Te-127 | 7.87e+01 | 2.82e+01 | 1.70e+01 | 5.83e+01 | 3.20e+02 | 0.00e+00 | 6.21e+03 |
| Te-127m | 5.49e+06 | 1.96e+06 | 6.69e+05 | 1.40e+06 | 2.23e+07 | 0.00e+00 | 1.84e+07 |
| Te-129 | 3.50e-11 | 1.32e-11 | 8.53e-12 | 2.69e-11 | 1.47e-10 | 0.00e+00 | 2.64e-11 |
| Te-129m | 7.22e+06 | 2.69e+06 | 1.14e+06 | 2.48e+06 | 3.02e+07 | 0.00e+00 | 3.64e+07 |
| Te-131 | 4.74e-34 | 1.98e-34 | 1.50e-34 | 3.90e-34 | 2.08e-33 | 0.00e+00 | 6.72e-35 |
| Te-131m | 4.34e+04 | 2.12e+04 | 1.77e+04 | 3.36e+04 | 2.15e+05 | 0.00e+00 | 2.11e+06 |
| Te-132 | 2.88e+05 | 1.86e+05 | 1.75e+05 | 2.06e+05 | 1.80e+06 | 0.00e+00 | 8.82e+06 |
| Te-133m | 2.63e-14 | 1.54e-14 | 1.48e-14 | 2.23e-14 | 1.52e-13 | 0.00e+00 | 5.28e-15 |
| Te-134 | 1.13e-19 | 7.39e-20 | 4.53e-20 | 9.86e-20 | 7.14e-19 | 0.00e+00 | 1.25e-22 |
| I-129 | 9.10e+07 | 7.82e+07 | 2.56e+08 | 2.01e+11 | 1.68e+08 | 0.00e+00 | 1.24e+07 |
| I-130 | 5.06e+04 | 1.49e+05 | 5.89e+04 | 1.26e+07 | 2.33e+05 | 0.00e+00 | 1.28e+05 |
| I-131 | 3.55e+07 | 5.08e+07 | 2.91e+07 | 1.67e+10 | 8.71e+07 | 0.00e+00 | 1.34e+07 |
| I-132 | 2.00e-02 | 5.36e-02 | 1.88e-02 | 1.88e+00 | 8.54e-02 | 0.00e+00 | 1.01e-02 |
| I-133 | 4.65e+05 | 8.09e+05 | 2.47e+05 | 1.19e+08 | 1.41e+06 | 0.00e+00 | 7.27e+05 |
| I-134 | 2.53e-13 | 6.87e-13 | 2.46e-13 | 1.19e-11 | 1.09e-12 | 0.00e+00 | 5.99e-16 |
| I-135 | 1.55e+03 | 4.06e+03 | 1.50e+03 | 2.68e+05 | 6.51e+03 | 0.00e+00 | 4.58e+03 |
| Cs-134 | 1.70e+10 | 4.03e+10 | 3.30e+10 | 0.00e+00 | 1.31e+10 | 4.33e+09 | 7.06e+08 |
| Cs-134m | 5.28e-01 | 1.11e+00 | 5.68e-01 | 0.00e+00 | 6.02e-01 | 9.49e-02 | 3.92e-01 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

Ri factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Goat's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Cs-135 | 5.43e+09 | 5.01e+09 | 2.22e+09 | 0.00e+00 | 1.89e+09 | 5.68e+08 | 1.17e+08 |
| Cs-136 | 7.90e+08 | 3.12e+09 | 2.24e+09 | 0.00e+00 | 1.73e+09 | 2.38e+08 | 3.54e+08 |
| Cs-137 | 2.21e+10 | 3.03e+10 | 1.98e+10 | 0.00e+00 | 1.03e+10 | 3.42e+09 | 5.86e+08 |
| Cs-138 | 2.91e-23 | 5.76e-23 | 2.85e-23 | 0.00e+00 | 4.23e-23 | 4.18e-24 | 2.46e-28 |
| Cs-139 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-139 | 5.45e-09 | 3.88e-12 | 1.60e-10 | 0.00e+00 | 3.63e-12 | 2.20e-12 | 9.67e-09 |
| Ba-140 | 3.23e+06 | 4.05e+03 | 2.11e+05 | 0.00e+00 | 1.38e+03 | 2.32e+03 | 6.64e+06 |
| Ba-141 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-142 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| La-140 | 5.42e-01 | 2.73e-01 | 7.22e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.00e+04 |
| La-141 | 3.60e-06 | 1.12e-06 | 1.83e-07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.33e-01 |
| La-142 | 2.28e-12 | 1.04e-12 | 2.59e-13 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.58e-09 |
| Ce-141 | 5.81e+02 | 3.93e+02 | 4.46e+01 | 0.00e+00 | 1.83e+02 | 0.00e+00 | 1.50e+06 |
| Ce-143 | 4.99e+00 | 3.69e+03 | 4.09e-01 | 0.00e+00 | 1.63e+00 | 0.00e+00 | 1.38e+05 |
| Ce-144 | 4.29e+04 | 1.79e+04 | 2.30e+03 | 0.00e+00 | 1.06e+04 | 0.00e+00 | 1.45e+07 |
| Pr-143 | 1.89e+01 | 7.60e+00 | 9.39e-01 | 0.00e+00 | 4.39e+00 | 0.00e+00 | 8.30e+04 |
| Pr-144 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Nd-147 | 1.13e+01 | 1.31e+01 | 7.81e-01 | 0.00e+00 | 7.63e+00 | 0.00e+00 | 6.27e+04 |
| Pm-147 | 3.44e+02 | 3.24e+01 | 1.31e+01 | 0.00e+00 | 6.11e+01 | 0.00e+00 | 4.08e+04 |
| Pm-148 | 7.12e+00 | 1.18e+00 | 5.95e-01 | 0.00e+00 | 2.23e+00 | 0.00e+00 | 9.28e+04 |
| Pm-148m | 1.03e+02 | 2.66e+01 | 2.04e+01 | 0.00e+00 | 4.02e+01 | 0.00e+00 | 2.26e+05 |
| Pm-149 | 5.13e-01 | 7.26e-02 | 2.96e-02 | 0.00e+00 | 1.37e-01 | 0.00e+00 | 1.36e+04 |
| Pm-151 | 7.76e-02 | 1.30e-02 | 6.58e-03 | 0.00e+00 | 2.33e-02 | 0.00e+00 | 3.58e+03 |
| Sm-151 | 3.20e+02 | 5.52e+01 | 1.32e+01 | 0.00e+00 | 6.16e+01 | 0.00e+00 | 2.43e+04 |
| Sm-153 | 2.39e-01 | 1.99e-01 | 1.45e-02 | 0.00e+00 | 6.43e-02 | 0.00e+00 | 7.10e+03 |
| Eu-152 | 9.01e+02 | 2.05e+02 | 1.80e+02 | 0.00e+00 | 1.27e+03 | 0.00e+00 | 1.18e+05 |
| Eu-154 | 2.85e+03 | 3.50e+02 | 2.49e+02 | 0.00e+00 | 1.68e+03 | 0.00e+00 | 2.54e+05 |
| Eu-155 | 3.90e+02 | 5.53e+01 | 3.57e+01 | 0.00e+00 | 2.55e+02 | 0.00e+00 | 4.35e+04 |
| Eu-156 | 3.02e+01 | 2.34e+01 | 3.77e+00 | 0.00e+00 | 1.56e+01 | 0.00e+00 | 1.60e+05 |
| Tb-160 | 1.79e+02 | 0.00e+00 | 2.23e+01 | 0.00e+00 | 7.39e+01 | 0.00e+00 | 1.65e+05 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

Ri factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Goat's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ho-166m | 1.25e+03 | 3.91e+02 | 2.97e+02 | 0.00e+00 | 5.84e+02 | 0.00e+00 | 1.19e+05 |
| W-181 | 4.07e+03 | 1.33e+03 | 1.42e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.51e+05 |
| W-185 | 1.55e+05 | 5.18e+04 | 5.45e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.99e+06 |
| W-187 | 7.83e+02 | 6.54e+02 | 2.29e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.14e+05 |
| Pb-210 | 8.78e+09 | 2.51e+09 | 3.12e+08 | 0.00e+00 | 7.06e+09 | 0.00e+00 | 1.29e+06 |
| Bi-210 | 4.27e+04 | 2.95e+05 | 2.45e+04 | 0.00e+00 | 3.55e+06 | 0.00e+00 | 4.40e+06 |
| Po-210 | 8.90e+07 | 1.89e+08 | 2.15e+07 | 0.00e+00 | 6.30e+08 | 0.00e+00 | 1.59e+07 |
| Ra-223 | 1.47e+10 | 2.26e+07 | 2.93e+09 | 0.00e+00 | 6.40e+08 | 0.00e+00 | 9.46e+08 |
| Ra-224 | 1.70e+09 | 4.11e+06 | 3.40e+08 | 0.00e+00 | 1.16e+08 | 0.00e+00 | 3.58e+08 |
| Ra-225 | 2.28e+10 | 2.70e+07 | 4.55e+09 | 0.00e+00 | 7.67e+08 | 0.00e+00 | 1.06e+09 |
| Ra-226 | 2.24e+12 | 4.26e+07 | 1.63e+12 | 0.00e+00 | 1.21e+09 | 0.00e+00 | 2.46e+09 |
| Ra-228 | 8.25e+11 | 2.30e+07 | 8.91e+11 | 0.00e+00 | 6.50e+08 | 0.00e+00 | 4.15e+08 |
| Ac-225 | 7.40e+03 | 1.02e+04 | 4.98e+02 | 0.00e+00 | 1.16e+03 | 0.00e+00 | 6.85e+05 |
| Ac-227 | 8.65e+06 | 1.15e+06 | 5.14e+05 | 0.00e+00 | 3.70e+05 | 0.00e+00 | 3.79e+05 |
| Th-227 | 3.36e+04 | 6.07e+02 | 9.67e+02 | 0.00e+00 | 3.45e+03 | 0.00e+00 | 1.32e+06 |
| Th-228 | 2.25e+06 | 3.81e+04 | 7.62e+04 | 0.00e+00 | 2.12e+05 | 0.00e+00 | 2.55e+06 |
| Th-229 | 6.31e+07 | 1.80e+06 | 1.04e+06 | 0.00e+00 | 8.72e+06 | 0.00e+00 | 3.62e+05 |
| Th-230 | 9.55e+06 | 5.43e+05 | 2.64e+05 | 0.00e+00 | 2.62e+06 | 0.00e+00 | 2.79e+05 |
| Th-232 | 1.07e+07 | 4.64e+05 | 6.96e+03 | 0.00e+00 | 2.24e+06 | 0.00e+00 | 2.37e+05 |
| Th-234 | 2.22e+02 | 1.30e+01 | 6.40e+00 | 0.00e+00 | 7.39e+01 | 0.00e+00 | 3.13e+05 |
| Pa-231 | 1.90e+07 | 7.14e+05 | 7.37e+05 | 0.00e+00 | 4.01e+06 | 0.00e+00 | 3.32e+05 |
| Pa-233 | 1.53e+01 | 3.09e+00 | 2.66e+00 | 0.00e+00 | 1.16e+01 | 0.00e+00 | 4.78e+04 |
| U-232 | 1.91e+09 | 0.00e+00 | 1.37e+08 | 0.00e+00 | 2.07e+08 | 0.00e+00 | 3.14e+07 |
| U-233 | 4.04e+08 | 0.00e+00 | 2.45e+07 | 0.00e+00 | 9.41e+07 | 0.00e+00 | 2.91e+07 |
| U-234 | 3.88e+08 | 0.00e+00 | 2.40e+07 | 0.00e+00 | 9.23e+07 | 0.00e+00 | 2.85e+07 |
| U-235 | 3.71e+08 | 0.00e+00 | 2.25e+07 | 0.00e+00 | 8.67e+07 | 0.00e+00 | 3.62e+07 |
| U-236 | 3.71e+08 | 0.00e+00 | 2.30e+07 | 0.00e+00 | 8.86e+07 | 0.00e+00 | 2.67e+07 |
| U-237 | 6.78e+03 | 0.00e+00 | 1.81e+03 | 0.00e+00 | 2.79e+04 | 0.00e+00 | 2.38e+06 |
| U-238 | 3.56e+08 | 0.00e+00 | 2.11e+07 | 0.00e+00 | 8.11e+07 | 0.00e+00 | 2.55e+07 |
| Np-237 | 5.84e+06 | 4.15e+05 | 2.57e+05 | 0.00e+00 | 1.91e+06 | 0.00e+00 | 3.68e+05 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# GOAT's MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Goat's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Np-238 | 4.34e+00 | 1.17e-01 | 6.75e-02 | 0.00e+00 | 3.96e-01 | 0.00e+00 | 1.09e+04 |
| Np-239 | 4.41e-01 | 4.34e-02 | 2.39e-02 | 0.00e+00 | 1.35e-01 | 0.00e+00 | 8.89e+03 |
| Pu-238 | 1.17e+06 | 1.48e+05 | 3.17e+04 | 0.00e+00 | 1.36e+05 | 0.00e+00 | 1.35e+05 |
| Pu-239 | 1.34e+06 | 1.62e+05 | 3.54e+04 | 0.00e+00 | 1.50e+05 | 0.00e+00 | 1.24e+05 |
| Pu-240 | 1.34e+06 | 1.61e+05 | 3.54e+04 | 0.00e+00 | 1.50e+05 | 0.00e+00 | 1.26e+05 |
| Pu-241 | 2.90e+04 | 1.38e+03 | 6.14e+02 | 0.00e+00 | 2.83e+03 | 0.00e+00 | 2.59e+03 |
| Pu-242 | 1.25e+06 | 1.56e+05 | 3.41e+04 | 0.00e+00 | 1.45e+05 | 0.00e+00 | 1.21e+05 |
| Pu-244 | 1.45e+06 | 1.78e+05 | 3.91e+04 | 0.00e+00 | 1.66e+05 | 0.00e+00 | 1.80e+05 |
| Am-241 | 3.47e+06 | 3.24e+06 | 2.48e+05 | 0.00e+00 | 1.87e+06 | 0.00e+00 | 3.41e+05 |
| Am-242m | 3.53e+06 | 3.07e+06 | 2.52e+05 | 0.00e+00 | 1.88e+06 | 0.00e+00 | 4.33e+05 |
| Am-243 | 3.50e+06 | 3.20e+06 | 2.46e+05 | 0.00e+00 | 1.85e+06 | 0.00e+00 | 4.03e+05 |
| Cm-242 | 8.72e+04 | 9.27e+04 | 5.80e+03 | 0.00e+00 | 2.63e+04 | 0.00e+00 | 3.35e+05 |
| Cm-243 | 2.77e+06 | 2.54e+06 | 1.74e+05 | 0.00e+00 | 8.10e+05 | 0.00e+00 | 3.62e+05 |
| Cm-244 | 2.11e+06 | 1.98e+06 | 1.33e+05 | 0.00e+00 | 6.20e+05 | 0.00e+00 | 3.49e+05 |
| Cm-245 | 4.35e+06 | 3.79e+06 | 2.67e+05 | 0.00e+00 | 1.25e+06 | 0.00e+00 | 3.26e+05 |
| Cm-246 | 4.31e+06 | 3.78e+06 | 2.67e+05 | 0.00e+00 | 1.24e+06 | 0.00e+00 | 3.20e+05 |
| Cm-247 | 4.21e+06 | 3.73e+06 | 2.63e+05 | 0.00e+00 | 1.22e+06 | 0.00e+00 | 4.21e+05 |
| Cm-248 | 3.50e+07 | 3.07e+07 | 2.17e+06 | 0.00e+00 | 1.01e+07 | 0.00e+00 | 6.82e+06 |
| Cf-252 | 1.19e+06 | 0.00e+00 | 2.87e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.31e+06 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

Ri factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Goat's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| H-3 | 0.00e+00 | 1.16e+03 | 1.16e+03 | 1.16e+03 | 1.16e+03 | 1.16e+03 | 1.16e+03 |
| Be-10 | 5.36e+05 | 8.30e+04 | 1.35e+04 | 0.00e+00 | 6.34e+04 | 0.00e+00 | 3.40e+06 |
| C-14 | 4.86e+08 | 9.72e+07 | 9.72e+07 | 9.72e+07 | 9.72e+07 | 9.72e+07 | 9.72e+07 |
| N-13 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| F-18 | 9.97e-04 | 0.00e+00 | 1.09e-04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 8.97e-05 |
| Na-22 | 1.10e+09 | 1.10e+09 | 1.10e+09 | 1.10e+09 | 1.10e+09 | 1.10e+09 | 1.10e+09 |
| Na-24 | 5.12e+05 | 5.12e+05 | 5.12e+05 | 5.12e+05 | 5.12e+05 | 5.12e+05 | 5.12e+05 |
| P-32 | 3.79e+10 | 2.35e+09 | 1.47e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.18e+09 |
| Ca-41 | 1.89e+09 | 0.00e+00 | 2.04e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.87e+06 |
| Sc-46 | 3.65e+01 | 7.11e+01 | 2.11e+01 | 0.00e+00 | 6.81e+01 | 0.00e+00 | 2.42e+05 |
| Cr-51 | 0.00e+00 | 0.00e+00 | 5.99e+03 | 3.33e+03 | 1.31e+03 | 8.55e+03 | 1.01e+06 |
| Mn-54 | 0.00e+00 | 1.68e+06 | 3.34e+05 | 0.00e+00 | 5.02e+05 | 0.00e+00 | 3.45e+06 |
| Mn-56 | 0.00e+00 | 8.83e-04 | 1.57e-04 | 0.00e+00 | 1.12e-03 | 0.00e+00 | 5.81e-02 |
| Fe-55 | 5.79e+05 | 4.10e+05 | 9.57e+04 | 0.00e+00 | 0.00e+00 | 2.60e+05 | 1.78e+05 |
| Fe-59 | 6.74e+05 | 1.57e+06 | 6.07e+05 | 0.00e+00 | 0.00e+00 | 4.96e+05 | 3.72e+06 |
| Co-57 | 0.00e+00 | 2.69e+05 | 4.52e+05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.03e+06 |
| Co-58 | 0.00e+00 | 9.52e+05 | 2.19e+06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.31e+07 |
| Co-60 | 0.00e+00 | 3.34e+06 | 7.51e+06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.34e+07 |
| Ni-59 | 1.06e+08 | 3.74e+07 | 1.80e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.86e+06 |
| Ni-63 | 1.42e+09 | 1.00e+08 | 4.81e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.59e+07 |
| Ni-65 | 8.25e-02 | 1.05e-02 | 4.80e-03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.72e-01 |
| Cu-64 | 0.00e+00 | 4.75e+03 | 2.23e+03 | 0.00e+00 | 1.20e+04 | 0.00e+00 | 3.68e+05 |
| Zn-65 | 2.53e+08 | 8.78e+08 | 4.09e+08 | 0.00e+00 | 5.62e+08 | 0.00e+00 | 3.72e+08 |
| Zn-69 | 4.82e-13 | 9.18e-13 | 6.42e-14 | 0.00e+00 | 6.00e-13 | 0.00e+00 | 1.69e-12 |
| Zn-69m | 3.96e+04 | 9.35e+04 | 8.57e+03 | 0.00e+00 | 5.68e+04 | 0.00e+00 | 5.14e+06 |
| Se-79 | 0.00e+00 | 2.01e+08 | 3.38e+07 | 0.00e+00 | 3.50e+08 | 0.00e+00 | 3.07e+07 |
| Br-82 | 0.00e+00 | 0.00e+00 | 6.73e+06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-83 | 0.00e+00 | 0.00e+00 | 2.18e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-84 | 0.00e+00 | 0.00e+00 | 3.71e-24 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-85 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# GOAT's MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Goat's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Rb-86 | 0.00e+00 | 5.67e+08 | 2.67e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 8.40e+07 |
| Rb-87 | 0.00e+00 | 6.28e+08 | 2.19e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.19e+07 |
| Rb-88 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Rb-89 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sr-89 | 5.62e+09 | 0.00e+00 | 1.61e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.69e+08 |
| Sr-90 | 1.71e+11 | 0.00e+00 | 3.41e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.90e+09 |
| Sr-91 | 1.12e+05 | 0.00e+00 | 4.46e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.08e+05 |
| Sr-92 | 1.90e+00 | 0.00e+00 | 8.11e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.85e+01 |
| Y-90 | 1.56e+01 | 0.00e+00 | 4.21e-01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.29e+05 |
| Y-91 | 1.90e+03 | 0.00e+00 | 5.08e+01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.77e+05 |
| Y-91m | 1.38e-20 | 0.00e+00 | 5.26e-22 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.50e-19 |
| Y-92 | 1.25e-05 | 0.00e+00 | 3.62e-07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.43e-01 |
| Y-93 | 4.96e-02 | 0.00e+00 | 1.36e-03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.52e+03 |
| Zr-93 | 3.31e+02 | 1.63e+01 | 8.91e+00 | 0.00e+00 | 5.77e+01 | 0.00e+00 | 1.54e+04 |
| Zr-95 | 1.98e+02 | 6.25e+01 | 4.30e+01 | 0.00e+00 | 9.18e+01 | 0.00e+00 | 1.44e+05 |
| Zr-97 | 9.48e-02 | 1.88e-02 | 8.64e-03 | 0.00e+00 | 2.84e-02 | 0.00e+00 | 5.08e+03 |
| Nb-93m | 1.03e+05 | 3.37e+04 | 8.44e+03 | 0.00e+00 | 3.94e+04 | 0.00e+00 | 1.21e+07 |
| Nb-95 | 1.69e+04 | 9.37e+03 | 5.16e+03 | 0.00e+00 | 9.08e+03 | 0.00e+00 | 4.01e+07 |
| Nb-97 | 1.44e-12 | 3.57e-13 | 1.30e-13 | 0.00e+00 | 4.18e-13 | 0.00e+00 | 8.53e-09 |
| Mo-93 | 0.00e+00 | 9.51e+07 | 2.60e+06 | 0.00e+00 | 2.73e+07 | 0.00e+00 | 1.16e+07 |
| Mo-99 | 0.00e+00 | 5.37e+06 | 1.02e+06 | 0.00e+00 | 1.23e+07 | 0.00e+00 | 9.62e+06 |
| Tc-101 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Tc-99 | 5.35e+06 | 7.87e+06 | 2.14e+06 | 0.00e+00 | 9.99e+07 | 8.14e+05 | 1.93e+08 |
| Tc-99m | 6.96e-01 | 1.94e+00 | 2.51e+01 | 0.00e+00 | 2.89e+01 | 1.08e+00 | 1.27e+03 |
| Ru-103 | 2.17e+02 | 0.00e+00 | 9.29e+01 | 0.00e+00 | 7.66e+02 | 0.00e+00 | 1.81e+04 |
| Ru-105 | 1.89e-04 | 0.00e+00 | 7.35e-05 | 0.00e+00 | 2.39e-03 | 0.00e+00 | 1.53e-01 |
| Ru-106 | 4.50e+03 | 0.00e+00 | 5.67e+02 | 0.00e+00 | 8.68e+03 | 0.00e+00 | 2.16e+05 |
| Rh-105 | 7.66e+04 | 5.54e+04 | 3.63e+04 | 0.00e+00 | 2.35e+05 | 0.00e+00 | 7.04e+06 |
| Pd-107 | 0.00e+00 | 2.49e+06 | 1.60e+05 | 0.00e+00 | 2.25e+07 | 0.00e+00 | 1.16e+07 |
| Pd-109 | 0.00e+00 | 9.87e+03 | 2.24e+03 | 0.00e+00 | 5.70e+04 | 0.00e+00 | 9.95e+05 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# GOAT's MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Goat's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ag-110m | 1.16e+07 | 1.09e+07 | 6.65e+06 | 0.00e+00 | 2.08e+07 | 0.00e+00 | 3.07e+09 |
| Ag-111 | 1.43e+06 | 5.93e+05 | 2.98e+05 | 0.00e+00 | 1.93e+06 | 0.00e+00 | 8.28e+08 |
| Cd-113m | 0.00e+00 | 6.46e+05 | 2.08e+04 | 0.00e+00 | 7.14e+05 | 0.00e+00 | 3.88e+06 |
| Cd-115m | 0.00e+00 | 2.75e+05 | 8.89e+03 | 0.00e+00 | 2.20e+05 | 0.00e+00 | 8.72e+06 |
| Sn-123 | 1.19e+08 | 1.95e+06 | 2.88e+06 | 1.56e+06 | 0.00e+00 | 0.00e+00 | 1.79e+08 |
| Sn-125 | 1.26e+07 | 2.50e+05 | 5.66e+05 | 1.96e+05 | 0.00e+00 | 0.00e+00 | 1.18e+08 |
| Sn-126 | 3.47e+08 | 6.46e+06 | 9.87e+06 | 1.70e+06 | 0.00e+00 | 0.00e+00 | 7.72e+07 |
| Sb-124 | 5.51e+06 | 1.01e+05 | 2.15e+06 | 1.25e+04 | 0.00e+00 | 4.81e+06 | 1.11e+08 |
| Sb-125 | 4.38e+06 | 4.79e+04 | 1.03e+06 | 4.19e+03 | 0.00e+00 | 3.85e+06 | 3.41e+07 |
| Sb-126 | 1.20e+06 | 2.46e+04 | 4.33e+05 | 6.81e+03 | 0.00e+00 | 8.64e+05 | 7.13e+07 |
| Sb-127 | 9.88e+04 | 2.11e+03 | 3.73e+04 | 1.11e+03 | 0.00e+00 | 6.72e+04 | 1.68e+07 |
| Te-125m | 3.60e+06 | 1.30e+06 | 4.82e+05 | 1.01e+06 | 0.00e+00 | 0.00e+00 | 1.06e+07 |
| Te-127 | 1.46e+02 | 5.17e+01 | 3.14e+01 | 1.01e+02 | 5.91e+02 | 0.00e+00 | 1.13e+04 |
| Te-127m | 1.01e+07 | 3.59e+06 | 1.20e+06 | 2.41e+06 | 4.10e+07 | 0.00e+00 | 2.52e+07 |
| Te-129 | 6.45e-11 | 2.40e-11 | 1.57e-11 | 4.61e-11 | 2.71e-10 | 0.00e+00 | 3.53e-10 |
| Te-129m | 1.32e+07 | 4.90e+06 | 2.09e+06 | 4.26e+06 | 5.53e+07 | 0.00e+00 | 4.96e+07 |
| Te-131 | 8.67e-34 | 3.57e-34 | 2.71e-34 | 6.68e-34 | 3.79e-33 | 0.00e+00 | 7.11e-35 |
| Te-131m | 7.89e+04 | 3.79e+04 | 3.16e+04 | 5.69e+04 | 3.95e+05 | 0.00e+00 | 3.04e+06 |
| Te-132 | 5.15e+05 | 3.26e+05 | 3.07e+05 | 3.44e+05 | 3.13e+06 | 0.00e+00 | 1.03e+07 |
| Te-133m | 4.74e-14 | 2.69e-14 | 2.62e-14 | 3.76e-14 | 2.66e-13 | 0.00e+00 | 1.09e-13 |
| Te-134 | 2.01e-19 | 1.29e-19 | 1.35e-19 | 1.65e-19 | 1.23e-18 | 0.00e+00 | 7.47e-21 |
| I-129 | 1.67e+08 | 1.41e+08 | 2.35e+08 | 1.71e+11 | 2.52e+08 | 0.00e+00 | 1.64e+07 |
| I-130 | 8.89e+04 | 2.57e+05 | 1.03e+05 | 2.10e+07 | 3.96e+05 | 0.00e+00 | 1.98e+05 |
| I-131 | 6.45e+07 | 9.03e+07 | 4.85e+07 | 2.63e+10 | 1.55e+08 | 0.00e+00 | 1.79e+07 |
| I-132 | 3.55e-02 | 9.30e-02 | 3.34e-02 | 3.13e+00 | 1.47e-01 | 0.00e+00 | 4.05e-02 |
| I-133 | 8.50e+05 | 1.44e+06 | 4.40e+05 | 2.01e+08 | 2.53e+06 | 0.00e+00 | 1.09e+06 |
| I-134 | 4.49e-13 | 1.19e-12 | 4.28e-13 | 1.98e-11 | 1.88e-12 | 0.00e+00 | 1.57e-14 |
| I-135 | 2.75e+03 | 7.09e+03 | 2.63e+03 | 4.56e+05 | 1.12e+04 | 0.00e+00 | 7.85e+03 |
| Cs-134 | 2.94e+10 | 6.93e+10 | 3.22e+10 | 0.00e+00 | 2.20e+10 | 8.41e+09 | 8.62e+08 |
| Cs-134m | 9.40e-01 | 1.95e+00 | 1.00e+00 | 0.00e+00 | 1.08e+00 | 1.90e-01 | 1.30e+00 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# GOAT's MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Goat's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Cs-135 | 9.98e+09 | 9.15e+09 | 2.14e+09 | 0.00e+00 | 3.49e+09 | 1.26e+09 | 1.60e+08 |
| Cs-136 | 1.34e+09 | 5.29e+09 | 3.55e+09 | 0.00e+00 | 2.88e+09 | 4.54e+08 | 4.26e+08 |
| Cs-137 | 4.02e+10 | 5.34e+10 | 1.86e+10 | 0.00e+00 | 1.82e+10 | 7.06e+09 | 7.60e+08 |
| Cs-138 | 5.29e-23 | 1.02e-22 | 5.08e-23 | 0.00e+00 | 7.49e-23 | 8.72e-24 | 4.61e-26 |
| Cs-139 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-139 | 1.01e-08 | 7.09e-12 | 2.94e-10 | 0.00e+00 | 6.69e-12 | 4.89e-12 | 8.99e-08 |
| Ba-140 | 5.82e+06 | 7.14e+03 | 3.75e+05 | 0.00e+00 | 2.42e+03 | 4.80e+03 | 8.98e+06 |
| Ba-141 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-142 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| La-140 | 9.73e-01 | 4.78e-01 | 1.27e-01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.75e+04 |
| La-141 | 6.63e-06 | 2.04e-06 | 3.36e-07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.61e-01 |
| La-142 | 4.12e-12 | 1.83e-12 | 4.56e-13 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.57e-08 |
| Ce-141 | 1.07e+03 | 7.12e+02 | 8.17e+01 | 0.00e+00 | 3.35e+02 | 0.00e+00 | 2.04e+06 |
| Ce-143 | 9.18e+00 | 6.68e+03 | 7.46e-01 | 0.00e+00 | 2.99e+00 | 0.00e+00 | 2.01e+05 |
| Ce-144 | 7.90e+04 | 3.27e+04 | 4.24e+03 | 0.00e+00 | 1.95e+04 | 0.00e+00 | 1.99e+07 |
| Pr-143 | 3.48e+01 | 1.39e+01 | 1.73e+00 | 0.00e+00 | 8.08e+00 | 0.00e+00 | 1.15e+05 |
| Pr-144 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Nd-147 | 2.17e+01 | 2.36e+01 | 1.42e+00 | 0.00e+00 | 1.39e+01 | 0.00e+00 | 8.53e+04 |
| Pm-147 | 6.18e+02 | 5.86e+01 | 2.39e+01 | 0.00e+00 | 1.12e+02 | 0.00e+00 | 5.58e+04 |
| Pm-148 | 1.31e+01 | 2.13e+00 | 1.07e+00 | 0.00e+00 | 3.84e+00 | 0.00e+00 | 1.27e+05 |
| Pm-148m | 1.79e+02 | 4.54e+01 | 3.55e+01 | 0.00e+00 | 6.87e+01 | 0.00e+00 | 2.86e+05 |
| Pm-149 | 9.45e-01 | 1.33e-01 | 5.45e-02 | 0.00e+00 | 2.53e-01 | 0.00e+00 | 1.96e+04 |
| Pm-151 | 1.42e-01 | 2.34e-02 | 1.19e-02 | 0.00e+00 | 4.21e-02 | 0.00e+00 | 5.26e+03 |
| Sm-151 | 5.22e+02 | 1.00e+02 | 2.36e+01 | 0.00e+00 | 1.10e+02 | 0.00e+00 | 3.41e+04 |
| Sm-153 | 4.38e-01 | 3.63e-01 | 2.67e-02 | 0.00e+00 | 1.19e-01 | 0.00e+00 | 1.02e+04 |
| Eu-152 | 1.46e+03 | 3.52e+02 | 3.10e+02 | 0.00e+00 | 1.63e+03 | 0.00e+00 | 1.29e+05 |
| Eu-154 | 4.73e+03 | 6.10e+02 | 4.30e+02 | 0.00e+00 | 2.73e+03 | 0.00e+00 | 3.22e+05 |
| Eu-155 | 1.02e+03 | 9.82e+01 | 6.08e+01 | 0.00e+00 | 3.84e+02 | 0.00e+00 | 5.63e+05 |
| Eu-156 | 5.46e+01 | 4.09e+01 | 6.68e+00 | 0.00e+00 | 2.75e+01 | 0.00e+00 | 2.09e+05 |
| Tb-160 | 3.18e+02 | 0.00e+00 | 3.97e+01 | 0.00e+00 | 1.26e+02 | 0.00e+00 | 2.06e+05 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

Ri factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Goat's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ho-166m | 2.14e+03 | 6.58e+02 | 4.76e+02 | 0.00e+00 | 9.63e+02 | 0.00e+00 | 1.62e+05 |
| W-181 | 7.53e+03 | 2.43e+03 | 2.54e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.07e+05 |
| W-185 | 2.87e+05 | 9.46e+04 | 1.00e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 8.17e+06 |
| W-187 | 1.43e+03 | 1.17e+03 | 4.09e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.16e+05 |
| Pb-210 | 1.34e+10 | 4.03e+09 | 5.19e+08 | 0.00e+00 | 1.27e+10 | 0.00e+00 | 1.75e+06 |
| Bi-210 | 7.88e+04 | 5.39e+05 | 4.51e+04 | 0.00e+00 | 6.55e+06 | 0.00e+00 | 6.16e+06 |
| Po-210 | 1.64e+08 | 3.45e+08 | 3.97e+07 | 0.00e+00 | 1.16e+09 | 0.00e+00 | 2.18e+07 |
| Ra-223 | 2.71e+10 | 4.11e+07 | 5.40e+09 | 0.00e+00 | 1.18e+09 | 0.00e+00 | 1.30e+09 |
| Ra-224 | 3.14e+09 | 7.50e+06 | 6.26e+08 | 0.00e+00 | 2.15e+08 | 0.00e+00 | 5.04e+08 |
| Ra-225 | 4.20e+10 | 4.93e+07 | 8.38e+09 | 0.00e+00 | 1.41e+09 | 0.00e+00 | 1.46e+09 |
| Ra-226 | 3.08e+12 | 7.78e+07 | 2.29e+12 | 0.00e+00 | 2.22e+09 | 0.00e+00 | 3.36e+09 |
| Ra-228 | 1.30e+12 | 4.19e+07 | 1.44e+12 | 0.00e+00 | 1.20e+09 | 0.00e+00 | 5.68e+08 |
| Ac-225 | 1.37e+04 | 1.86e+04 | 9.16e+02 | 0.00e+00 | 2.14e+03 | 0.00e+00 | 9.46e+05 |
| Ac-227 | 1.22e+07 | 1.81e+06 | 7.29e+05 | 0.00e+00 | 5.26e+05 | 0.00e+00 | 5.18e+05 |
| Th-227 | 6.19e+04 | 1.11e+03 | 1.79e+03 | 0.00e+00 | 6.35e+03 | 0.00e+00 | 1.82e+06 |
| Th-228 | 3.98e+06 | 6.67e+04 | 1.35e+05 | 0.00e+00 | 3.75e+05 | 0.00e+00 | 3.49e+06 |
| Th-229 | 8.56e+07 | 2.46e+06 | 1.42e+06 | 0.00e+00 | 1.19e+07 | 0.00e+00 | 4.95e+05 |
| Th-230 | 1.29e+07 | 7.36e+05 | 3.59e+05 | 0.00e+00 | 3.58e+06 | 0.00e+00 | 3.82e+05 |
| Th-232 | 1.45e+07 | 6.28e+05 | 9.75e+03 | 0.00e+00 | 3.06e+06 | 0.00e+00 | 3.25e+05 |
| Th-234 | 4.07e+02 | 2.39e+01 | 1.18e+01 | 0.00e+00 | 1.36e+02 | 0.00e+00 | 4.32e+05 |
| Pa-231 | 2.58e+07 | 9.69e+05 | 1.01e+06 | 0.00e+00 | 5.44e+06 | 0.00e+00 | 4.55e+05 |
| Pa-233 | 2.76e+01 | 5.31e+00 | 4.74e+00 | 0.00e+00 | 2.00e+01 | 0.00e+00 | 6.06e+04 |
| U-232 | 3.52e+09 | 0.00e+00 | 2.52e+08 | 0.00e+00 | 3.82e+08 | 0.00e+00 | 4.30e+07 |
| U-233 | 7.42e+08 | 0.00e+00 | 4.51e+07 | 0.00e+00 | 1.74e+08 | 0.00e+00 | 3.98e+07 |
| U-234 | 7.12e+08 | 0.00e+00 | 4.42e+07 | 0.00e+00 | 1.71e+08 | 0.00e+00 | 3.90e+07 |
| U-235 | 6.82e+08 | 0.00e+00 | 4.15e+07 | 0.00e+00 | 1.60e+08 | 0.00e+00 | 4.95e+07 |
| U-236 | 6.82e+08 | 0.00e+00 | 4.24e+07 | 0.00e+00 | 1.63e+08 | 0.00e+00 | 3.66e+07 |
| U-237 | 1.25e+04 | 0.00e+00 | 3.33e+03 | 0.00e+00 | 5.14e+04 | 0.00e+00 | 3.31e+06 |
| U-238 | 6.52e+08 | 0.00e+00 | 3.88e+07 | 0.00e+00 | 1.50e+08 | 0.00e+00 | 3.49e+07 |
| Np-237 | 7.96e+06 | 5.71e+05 | 3.50e+05 | 0.00e+00 | 2.59e+06 | 0.00e+00 | 5.03e+05 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# GOAT's MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Goat's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Np-238 | 7.98e+00 | 2.14e-01 | 1.24e-01 | 0.00e+00 | 7.32e-01 | 0.00e+00 | 1.57e+04 |
| Np-239 | 8.42e-01 | 7.94e-02 | 4.41e-02 | 0.00e+00 | 2.49e-01 | 0.00e+00 | 1.28e+04 |
| Pu-238 | 1.60e+06 | 2.05e+05 | 4.35e+04 | 0.00e+00 | 1.87e+05 | 0.00e+00 | 1.85e+05 |
| Pu-239 | 1.83e+06 | 2.22e+05 | 4.81e+04 | 0.00e+00 | 2.05e+05 | 0.00e+00 | 1.69e+05 |
| Pu-240 | 1.83e+06 | 2.22e+05 | 4.81e+04 | 0.00e+00 | 2.05e+05 | 0.00e+00 | 1.72e+05 |
| Pu-241 | 4.18e+04 | 2.00e+03 | 8.81e+02 | 0.00e+00 | 4.08e+03 | 0.00e+00 | 3.53e+03 |
| Pu-242 | 1.70e+06 | 2.14e+05 | 4.64e+04 | 0.00e+00 | 1.97e+05 | 0.00e+00 | 1.66e+05 |
| Pu-244 | 1.98e+06 | 2.44e+05 | 5.31e+04 | 0.00e+00 | 2.26e+05 | 0.00e+00 | 2.47e+05 |
| Am-241 | 4.73e+06 | 4.46e+06 | 3.41e+05 | 0.00e+00 | 2.55e+06 | 0.00e+00 | 4.66e+05 |
| Am-242m | 4.83e+06 | 4.25e+06 | 3.47e+05 | 0.00e+00 | 2.57e+06 | 0.00e+00 | 5.92e+05 |
| Am-243 | 4.76e+06 | 4.40e+06 | 3.36e+05 | 0.00e+00 | 2.52e+06 | 0.00e+00 | 5.52e+05 |
| Cm-242 | 1.61e+05 | 1.69e+05 | 1.07e+04 | 0.00e+00 | 4.86e+04 | 0.00e+00 | 4.59e+05 |
| Cm-243 | 3.88e+06 | 3.60e+06 | 2.44e+05 | 0.00e+00 | 1.14e+06 | 0.00e+00 | 4.95e+05 |
| Cm-244 | 3.01e+06 | 2.85e+06 | 1.90e+05 | 0.00e+00 | 8.89e+05 | 0.00e+00 | 4.78e+05 |
| Cm-245 | 5.92e+06 | 5.21e+06 | 3.65e+05 | 0.00e+00 | 1.71e+06 | 0.00e+00 | 4.46e+05 |
| Cm-246 | 5.88e+06 | 5.21e+06 | 3.64e+05 | 0.00e+00 | 1.70e+06 | 0.00e+00 | 4.39e+05 |
| Cm-247 | 5.73e+06 | 5.13e+06 | 3.59e+05 | 0.00e+00 | 1.68e+06 | 0.00e+00 | 5.76e+05 |
| Cm-248 | 4.76e+07 | 4.22e+07 | 2.96e+06 | 0.00e+00 | 1.38e+07 | 0.00e+00 | 9.27e+06 |
| Cf-252 | 2.04e+06 | 0.00e+00 | 4.92e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.79e+06 |

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Ri factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Goat's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| H-3 | 0.00e+00 | 1.83e+03 | 1.83e+03 | 1.83e+03 | 1.83e+03 | 1.83e+03 | 1.83e+03 |
| Be-10 | 1.33e+06 | 1.55e+05 | 3.35e+04 | 0.00e+00 | 1.10e+05 | 0.00e+00 | 2.71e+06 |
| C-14 | 1.19e+09 | 2.39e+08 | 2.39e+08 | 2.39e+08 | 2.39e+08 | 2.39e+08 | 2.39e+08 |
| N-13 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| F-18 | 2.37e-03 | 0.00e+00 | 2.35e-04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.41e-04 |
| Na-22 | 2.28e+09 | 2.28e+09 | 2.28e+09 | 2.28e+09 | 2.28e+09 | 2.28e+09 | 2.28e+09 |
| Na-24 | 1.07e+06 | 1.07e+06 | 1.07e+06 | 1.07e+06 | 1.07e+06 | 1.07e+06 | 1.07e+06 |
| P-32 | 9.33e+10 | 4.37e+09 | 3.60e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.58e+09 |
| Ca-41 | 2.74e+09 | 0.00e+00 | 2.99e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.50e+06 |
| Sc-46 | 8.20e+01 | 1.12e+02 | 4.33e+01 | 0.00e+00 | 9.94e+01 | 0.00e+00 | 1.64e+05 |
| Cr-51 | 0.00e+00 | 0.00e+00 | 1.22e+04 | 6.78e+03 | 1.85e+03 | 1.24e+04 | 6.48e+05 |
| Mn-54 | 0.00e+00 | 2.52e+06 | 6.70e+05 | 0.00e+00 | 7.06e+05 | 0.00e+00 | 2.11e+06 |
| Mn-56 | 0.00e+00 | 1.54e-03 | 3.48e-04 | 0.00e+00 | 1.86e-03 | 0.00e+00 | 2.23e-01 |
| Fe-55 | 1.45e+06 | 7.71e+05 | 2.39e+05 | 0.00e+00 | 0.00e+00 | 4.36e+05 | 1.43e+05 |
| Fe-59 | 1.56e+06 | 2.53e+06 | 1.26e+06 | 0.00e+00 | 0.00e+00 | 7.33e+05 | 2.63e+06 |
| Co-57 | 0.00e+00 | 4.60e+05 | 9.32e+05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.77e+06 |
| Co-58 | 0.00e+00 | 1.45e+06 | 4.45e+06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 8.49e+06 |
| Co-60 | 0.00e+00 | 5.18e+06 | 1.53e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.87e+07 |
| Ni-59 | 2.66e+08 | 7.08e+07 | 4.51e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.70e+06 |
| Ni-63 | 3.56e+09 | 1.90e+08 | 1.21e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.28e+07 |
| Ni-65 | 2.02e-01 | 1.90e-02 | 1.11e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.33e+00 |
| Cu-64 | 0.00e+00 | 8.34e+03 | 5.04e+03 | 0.00e+00 | 2.02e+04 | 0.00e+00 | 3.92e+05 |
| Zn-65 | 4.96e+08 | 1.32e+09 | 8.22e+08 | 0.00e+00 | 8.33e+08 | 0.00e+00 | 2.32e+08 |
| Zn-69 | 1.18e-12 | 1.71e-12 | 1.58e-13 | 0.00e+00 | 1.04e-12 | 0.00e+00 | 1.08e-10 |
| Zn-69m | 9.68e+04 | 1.65e+05 | 1.95e+04 | 0.00e+00 | 9.58e+04 | 0.00e+00 | 5.37e+06 |
| Se-79 | 0.00e+00 | 3.75e+08 | 8.31e+07 | 0.00e+00 | 6.09e+08 | 0.00e+00 | 2.46e+07 |
| Br-82 | 0.00e+00 | 0.00e+00 | 1.38e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-83 | 0.00e+00 | 0.00e+00 | 5.36e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-84 | 0.00e+00 | 0.00e+00 | 8.40e-24 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-85 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

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Ri factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Goat's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Rb-86 | 0.00e+00 | 1.05e+09 | 6.47e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.77e+07 |
| Rb-87 | 0.00e+00 | 1.17e+09 | 5.42e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.75e+07 |
| Rb-88 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Rb-89 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sr-89 | 1.39e+10 | 0.00e+00 | 3.97e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.38e+08 |
| Sr-90 | 3.53e+11 | 0.00e+00 | 7.11e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.16e+09 |
| Sr-91 | 2.75e+05 | 0.00e+00 | 1.04e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.07e+05 |
| Sr-92 | 4.65e+00 | 0.00e+00 | 1.86e-01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 8.81e+01 |
| Y-90 | 3.87e+01 | 0.00e+00 | 1.04e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.10e+05 |
| Y-91 | 4.68e+03 | 0.00e+00 | 1.25e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.24e+05 |
| Y-91m | 3.36e-20 | 0.00e+00 | 1.22e-21 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.59e-17 |
| Y-92 | 3.07e-05 | 0.00e+00 | 8.78e-07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 8.87e-01 |
| Y-93 | 1.22e-01 | 0.00e+00 | 3.35e-03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.82e+03 |
| Zr-93 | 8.24e+02 | 3.09e+01 | 2.20e+01 | 0.00e+00 | 1.19e+02 | 0.00e+00 | 1.17e+04 |
| Zr-95 | 4.60e+02 | 1.01e+02 | 9.00e+01 | 0.00e+00 | 1.45e+02 | 0.00e+00 | 1.05e+05 |
| Zr-97 | 2.31e-01 | 3.33e-02 | 1.97e-02 | 0.00e+00 | 4.79e-02 | 0.00e+00 | 5.05e+03 |
| Nb-93m | 2.58e+05 | 6.45e+04 | 2.12e+04 | 0.00e+00 | 6.96e+04 | 0.00e+00 | 9.72e+06 |
| Nb-95 | 3.81e+04 | 1.49e+04 | 1.06e+04 | 0.00e+00 | 1.40e+04 | 0.00e+00 | 2.75e+07 |
| Nb-97 | 3.49e-12 | 6.31e-13 | 2.95e-13 | 0.00e+00 | 7.00e-13 | 0.00e+00 | 1.95e-07 |
| Mo-93 | 0.00e+00 | 1.78e+08 | 6.40e+06 | 0.00e+00 | 4.70e+07 | 0.00e+00 | 9.03e+06 |
| Mo-99 | 0.00e+00 | 9.77e+06 | 2.42e+06 | 0.00e+00 | 2.09e+07 | 0.00e+00 | 8.08e+06 |
| Tc-101 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Tc-99 | 1.32e+07 | 1.47e+07 | 5.28e+06 | 0.00e+00 | 1.73e+08 | 1.30e+06 | 1.54e+08 |
| Tc-99m | 1.60e+00 | 3.13e+00 | 5.19e+01 | 0.00e+00 | 4.55e+01 | 1.59e+00 | 1.78e+03 |
| Ru-103 | 5.14e+02 | 0.00e+00 | 1.98e+02 | 0.00e+00 | 1.29e+03 | 0.00e+00 | 1.33e+04 |
| Ru-105 | 4.62e-04 | 0.00e+00 | 1.68e-04 | 0.00e+00 | 4.06e-03 | 0.00e+00 | 3.02e-01 |
| Ru-106 | 1.11e+04 | 0.00e+00 | 1.38e+03 | 0.00e+00 | 1.50e+04 | 0.00e+00 | 1.72e+05 |
| Rh-105 | 1.88e+05 | 1.01e+05 | 8.62e+04 | 0.00e+00 | 4.02e+05 | 0.00e+00 | 6.25e+06 |
| Pd-107 | 0.00e+00 | 4.66e+06 | 3.96e+05 | 0.00e+00 | 3.90e+07 | 0.00e+00 | 9.25e+06 |
| Pd-109 | 0.00e+00 | 1.84e+04 | 5.51e+03 | 0.00e+00 | 9.86e+04 | 0.00e+00 | 1.09e+06 |

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Ri factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Goat's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ag-110m | 2.51e+07 | 1.69e+07 | 1.35e+07 | 0.00e+00 | 3.15e+07 | 0.00e+00 | 2.01e+09 |
| Ag-111 | 3.53e+06 | 1.10e+06 | 7.29e+05 | 0.00e+00 | 3.33e+06 | 0.00e+00 | 6.76e+08 |
| Cd-113m | 0.00e+00 | 1.20e+06 | 5.13e+04 | 0.00e+00 | 1.24e+06 | 0.00e+00 | 3.11e+06 |
| Cd-115m | 0.00e+00 | 5.15e+05 | 2.19e+04 | 0.00e+00 | 3.83e+05 | 0.00e+00 | 7.00e+06 |
| Sn-123 | 2.93e+08 | 3.63e+06 | 7.14e+06 | 3.85e+06 | 0.00e+00 | 0.00e+00 | 1.44e+08 |
| Sn-125 | 3.09e+07 | 4.66e+05 | 1.38e+06 | 4.83e+05 | 0.00e+00 | 0.00e+00 | 9.57e+07 |
| Sn-126 | 8.22e+08 | 1.02e+07 | 2.33e+07 | 2.81e+06 | 0.00e+00 | 0.00e+00 | 6.17e+07 |
| Sb-124 | 1.30e+07 | 1.69e+05 | 4.57e+06 | 2.88e+04 | 0.00e+00 | 7.23e+06 | 8.15e+07 |
| Sb-125 | 1.04e+07 | 8.05e+04 | 2.19e+06 | 9.67e+03 | 0.00e+00 | 5.82e+06 | 2.49e+07 |
| Sb-126 | 2.75e+06 | 4.21e+04 | 9.88e+05 | 1.61e+04 | 0.00e+00 | 1.31e+06 | 5.55e+07 |
| Sb-127 | 2.38e+05 | 3.68e+03 | 8.26e+04 | 2.65e+03 | 0.00e+00 | 1.03e+05 | 1.34e+07 |
| Te-125m | 8.85e+06 | 2.40e+06 | 1.18e+06 | 2.48e+06 | 0.00e+00 | 0.00e+00 | 8.54e+06 |
| Te-127 | 3.59e+02 | 9.67e+01 | 7.69e+01 | 2.48e+02 | 1.02e+03 | 0.00e+00 | 1.40e+04 |
| Te-127m | 2.50e+07 | 6.72e+06 | 2.96e+06 | 5.97e+06 | 7.12e+07 | 0.00e+00 | 2.02e+07 |
| Te-129 | 1.59e-10 | 4.44e-11 | 3.78e-11 | 1.14e-10 | 4.65e-10 | 0.00e+00 | 9.90e-09 |
| Te-129m | 3.26e+07 | 9.09e+06 | 5.06e+06 | 1.05e+07 | 9.56e+07 | 0.00e+00 | 3.97e+07 |
| Te-131 | 2.13e-33 | 6.48e-34 | 6.33e-34 | 1.63e-33 | 6.43e-33 | 0.00e+00 | 1.12e-32 |
| Te-131m | 1.92e+05 | 6.65e+04 | 7.07e+04 | 1.37e+05 | 6.43e+05 | 0.00e+00 | 2.70e+06 |
| Te-132 | 1.23e+06 | 5.44e+05 | 6.58e+05 | 7.93e+05 | 5.05e+06 | 0.00e+00 | 5.48e+06 |
| Te-133m | 1.13e-13 | 4.59e-14 | 5.69e-14 | 8.80e-14 | 4.36e-13 | 0.00e+00 | 3.50e-12 |
| Te-134 | 4.79e-19 | 2.15e-19 | 2.87e-19 | 3.78e-19 | 1.99e-18 | 0.00e+00 | 2.19e-18 |
| I-129 | 4.12e+08 | 2.53e+08 | 2.26e+08 | 1.65e+11 | 4.26e+08 | 0.00e+00 | 1.27e+07 |
| I-130 | 2.08e+05 | 4.20e+05 | 2.16e+05 | 4.63e+07 | 6.28e+05 | 0.00e+00 | 1.97e+05 |
| I-131 | 1.56e+08 | 1.57e+08 | 8.94e+07 | 5.20e+10 | 2.58e+08 | 0.00e+00 | 1.40e+07 |
| I-132 | 8.41e-02 | 1.54e-01 | 7.10e-02 | 7.17e+00 | 2.36e-01 | 0.00e+00 | 1.82e-01 |
| I-133 | 2.06e+06 | 2.55e+06 | 9.66e+05 | 4.74e+08 | 4.25e+06 | 0.00e+00 | 1.03e+06 |
| I-134 | 1.06e-12 | 1.98e-12 | 9.09e-13 | 4.54e-11 | 3.02e-12 | 0.00e+00 | 1.31e-12 |
| I-135 | 6.52e+03 | 1.17e+04 | 5.55e+03 | 1.04e+06 | 1.80e+04 | 0.00e+00 | 8.94e+03 |
| Cs-134 | 6.79e+10 | 1.11e+11 | 2.35e+10 | 0.00e+00 | 3.45e+10 | 1.24e+10 | 6.01e+08 |
| Cs-134m | 2.23e+00 | 3.30e+00 | 2.15e+00 | 0.00e+00 | 1.74e+00 | 2.88e-01 | 4.17e+00 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

Ri factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Goat's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Cs-135 | 2.46e+10 | 1.71e+10 | 1.76e+09 | 0.00e+00 | 6.04e+09 | 2.02e+09 | 1.28e+08 |
| Cs-136 | 3.04e+09 | 8.34e+09 | 5.40e+09 | 0.00e+00 | 4.44e+09 | 6.63e+08 | 2.93e+08 |
| Cs-137 | 9.67e+10 | 9.26e+10 | 1.37e+10 | 0.00e+00 | 3.02e+10 | 1.09e+10 | 5.80e+08 |
| Cs-138 | 1.28e-22 | 1.78e-22 | 1.13e-22 | 0.00e+00 | 1.25e-22 | 1.35e-23 | 8.21e-23 |
| Cs-139 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-139 | 2.48e-08 | 1.32e-11 | 7.18e-10 | 0.00e+00 | 1.15e-11 | 7.78e-12 | 1.43e-06 |
| Ba-140 | 1.41e+07 | 1.23e+04 | 8.20e+05 | 0.00e+00 | 4.01e+03 | 7.34e+03 | 7.12e+06 |
| Ba-141 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-142 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| La-140 | 2.33e+00 | 8.15e-01 | 2.75e-01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.27e+04 |
| La-141 | 1.63e-05 | 3.81e-06 | 8.27e-07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 8.47e-01 |
| La-142 | 9.95e-12 | 3.17e-12 | 9.94e-13 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.29e-07 |
| Ce-141 | 2.62e+03 | 1.31e+03 | 1.94e+02 | 0.00e+00 | 5.74e+02 | 0.00e+00 | 1.63e+06 |
| Ce-143 | 2.25e+01 | 1.22e+04 | 1.77e+00 | 0.00e+00 | 5.12e+00 | 0.00e+00 | 1.79e+05 |
| Ce-144 | 1.95e+05 | 6.10e+04 | 1.04e+04 | 0.00e+00 | 3.38e+04 | 0.00e+00 | 1.59e+07 |
| Pr-143 | 8.62e+01 | 2.59e+01 | 4.28e+00 | 0.00e+00 | 1.40e+01 | 0.00e+00 | 9.30e+04 |
| Pr-144 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Nd-147 | 5.34e+01 | 4.32e+01 | 3.35e+00 | 0.00e+00 | 2.37e+01 | 0.00e+00 | 6.85e+04 |
| Pm-147 | 1.54e+03 | 1.10e+02 | 5.93e+01 | 0.00e+00 | 1.95e+02 | 0.00e+00 | 4.46e+04 |
| Pm-148 | 3.19e+01 | 3.84e+00 | 2.48e+00 | 0.00e+00 | 6.52e+00 | 0.00e+00 | 1.03e+05 |
| Pm-148m | 3.67e+02 | 7.31e+01 | 7.31e+01 | 0.00e+00 | 1.08e+02 | 0.00e+00 | 2.06e+05 |
| Pm-149 | 2.33e+00 | 2.48e-01 | 1.34e-01 | 0.00e+00 | 4.38e-01 | 0.00e+00 | 1.69e+04 |
| Pm-151 | 3.46e-01 | 4.21e-02 | 2.74e-02 | 0.00e+00 | 7.13e-02 | 0.00e+00 | 4.78e+03 |
| Sm-151 | 1.26e+03 | 1.88e+02 | 5.92e+01 | 0.00e+00 | 1.94e+02 | 0.00e+00 | 2.73e+04 |
| Sm-153 | 1.08e+00 | 6.73e-01 | 6.49e-02 | 0.00e+00 | 2.05e-01 | 0.00e+00 | 8.95e+03 |
| Eu-152 | 3.03e+03 | 5.51e+02 | 6.54e+02 | 0.00e+00 | 2.33e+03 | 0.00e+00 | 9.05e+04 |
| Eu-154 | 1.14e+04 | 1.02e+03 | 9.33e+02 | 0.00e+00 | 4.49e+03 | 0.00e+00 | 2.37e+05 |
| Eu-155 | 2.32e+03 | 1.67e+02 | 1.31e+02 | 0.00e+00 | 6.27e+02 | 0.00e+00 | 4.19e+05 |
| Eu-156 | 1.32e+02 | 7.06e+01 | 1.46e+01 | 0.00e+00 | 4.55e+01 | 0.00e+00 | 1.60e+05 |
| Tb-160 | 6.73e+02 | 0.00e+00 | 8.35e+01 | 0.00e+00 | 2.00e+02 | 0.00e+00 | 1.49e+05 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

Ri factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Goat's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ho-166m | 5.33e+03 | 1.12e+03 | 9.43e+02 | 0.00e+00 | 1.59e+03 | 0.00e+00 | 1.30e+05 |
| W-181 | 1.85e+04 | 4.55e+03 | 6.25e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.66e+05 |
| W-185 | 7.07e+05 | 1.76e+05 | 2.47e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.58e+06 |
| W-187 | 3.47e+03 | 2.06e+03 | 9.22e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.89e+05 |
| Pb-210 | 2.90e+10 | 7.45e+09 | 1.28e+09 | 0.00e+00 | 2.24e+10 | 0.00e+00 | 1.40e+06 |
| Bi-210 | 1.94e+05 | 1.01e+06 | 1.11e+05 | 0.00e+00 | 1.13e+07 | 0.00e+00 | 5.10e+06 |
| Po-210 | 4.05e+08 | 6.47e+08 | 9.77e+07 | 0.00e+00 | 2.01e+09 | 0.00e+00 | 1.74e+07 |
| Ra-223 | 6.65e+10 | 7.69e+07 | 1.33e+10 | 0.00e+00 | 2.04e+09 | 0.00e+00 | 1.06e+09 |
| Ra-224 | 7.72e+09 | 1.40e+07 | 1.55e+09 | 0.00e+00 | 3.71e+08 | 0.00e+00 | 4.24e+08 |
| Ra-225 | 1.03e+11 | 9.24e+07 | 2.07e+10 | 0.00e+00 | 2.45e+09 | 0.00e+00 | 1.19e+09 |
| Ra-226 | 4.54e+12 | 1.45e+08 | 3.73e+12 | 0.00e+00 | 3.85e+09 | 0.00e+00 | 2.69e+09 |
| Ra-228 | 3.02e+12 | 7.83e+07 | 3.39e+12 | 0.00e+00 | 2.08e+09 | 0.00e+00 | 4.56e+08 |
| Ac-225 | 3.37e+04 | 3.47e+04 | 2.26e+03 | 0.00e+00 | 3.71e+03 | 0.00e+00 | 7.72e+05 |
| Ac-227 | 2.03e+07 | 3.27e+06 | 1.26e+06 | 0.00e+00 | 7.19e+05 | 0.00e+00 | 4.15e+05 |
| Th-227 | 1.53e+05 | 2.08e+03 | 4.41e+03 | 0.00e+00 | 1.10e+04 | 0.00e+00 | 1.47e+06 |
| Th-228 | 1.00e+07 | 1.28e+05 | 3.38e+05 | 0.00e+00 | 6.66e+05 | 0.00e+00 | 2.80e+06 |
| Th-229 | 1.16e+08 | 2.92e+06 | 1.93e+06 | 0.00e+00 | 1.43e+07 | 0.00e+00 | 3.97e+05 |
| Th-230 | 1.75e+07 | 8.79e+05 | 4.89e+05 | 0.00e+00 | 4.28e+06 | 0.00e+00 | 3.06e+05 |
| Th-232 | 1.95e+07 | 7.50e+05 | 1.49e+04 | 0.00e+00 | 3.66e+06 | 0.00e+00 | 2.60e+05 |
| Th-234 | 1.01e+03 | 4.45e+01 | 2.91e+01 | 0.00e+00 | 2.36e+02 | 0.00e+00 | 3.48e+05 |
| Pa-231 | 3.49e+07 | 1.16e+06 | 1.39e+06 | 0.00e+00 | 6.32e+06 | 0.00e+00 | 3.64e+05 |
| Pa-233 | 5.62e+01 | 8.76e+00 | 9.81e+00 | 0.00e+00 | 3.23e+01 | 0.00e+00 | 4.47e+04 |
| U-232 | 8.68e+09 | 0.00e+00 | 6.22e+08 | 0.00e+00 | 6.61e+08 | 0.00e+00 | 3.44e+07 |
| U-233 | 1.84e+09 | 0.00e+00 | 1.11e+08 | 0.00e+00 | 3.01e+08 | 0.00e+00 | 3.18e+07 |
| U-234 | 1.76e+09 | 0.00e+00 | 1.09e+08 | 0.00e+00 | 2.95e+08 | 0.00e+00 | 3.12e+07 |
| U-235 | 1.69e+09 | 0.00e+00 | 1.02e+08 | 0.00e+00 | 2.77e+08 | 0.00e+00 | 3.96e+07 |
| U-236 | 1.69e+09 | 0.00e+00 | 1.05e+08 | 0.00e+00 | 2.83e+08 | 0.00e+00 | 2.92e+07 |
| U-237 | 3.09e+04 | 0.00e+00 | 8.20e+03 | 0.00e+00 | 8.90e+04 | 0.00e+00 | 2.72e+06 |
| U-238 | 1.61e+09 | 0.00e+00 | 9.58e+07 | 0.00e+00 | 2.59e+08 | 0.00e+00 | 2.79e+07 |
| Np-237 | 1.10e+07 | 7.26e+05 | 4.83e+05 | 0.00e+00 | 2.99e+06 | 0.00e+00 | 4.03e+05 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# GOAT's MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Goat's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Np-238 | 1.97e+01 | 3.98e-01 | 3.07e-01 | 0.00e+00 | 1.27e+00 | 0.00e+00 | 1.36e+04 |
| Np-239 | 2.07e+00 | 1.49e-01 | 1.05e-01 | 0.00e+00 | 4.30e-01 | 0.00e+00 | 1.10e+04 |
| Pu-238 | 2.35e+06 | 2.72e+05 | 6.24e+04 | 0.00e+00 | 2.27e+05 | 0.00e+00 | 1.48e+05 |
| Pu-239 | 2.55e+06 | 2.72e+05 | 6.54e+04 | 0.00e+00 | 2.41e+05 | 0.00e+00 | 1.35e+05 |
| Pu-240 | 2.53e+06 | 2.82e+05 | 6.54e+04 | 0.00e+00 | 2.41e+05 | 0.00e+00 | 1.38e+05 |
| Pu-241 | 7.62e+04 | 3.11e+03 | 1.58e+03 | 0.00e+00 | 5.83e+03 | 0.00e+00 | 2.84e+03 |
| Pu-242 | 2.35e+06 | 2.72e+05 | 6.30e+04 | 0.00e+00 | 2.31e+05 | 0.00e+00 | 1.32e+05 |
| Pu-244 | 2.74e+06 | 3.12e+06 | 7.21e+04 | 0.00e+00 | 2.67e+05 | 0.00e+00 | 1.97e+05 |
| Am-241 | 6.65e+06 | 5.72e+06 | 4.99e+05 | 0.00e+00 | 3.05e+06 | 0.00e+00 | 3.73e+05 |
| Am-242m | 6.91e+06 | 5.53e+06 | 5.13e+05 | 0.00e+00 | 3.11e+06 | 0.00e+00 | 4.74e+05 |
| Am-243 | 6.61e+06 | 5.58e+06 | 4.85e+05 | 0.00e+00 | 2.99e+06 | 0.00e+00 | 4.42e+05 |
| Cm-242 | 3.96e+05 | 3.16e+05 | 2.63e+04 | 0.00e+00 | 8.43e+04 | 0.00e+00 | 3.68e+05 |
| Cm-243 | 6.31e+06 | 5.13e+06 | 4.06e+05 | 0.00e+00 | 1.52e+06 | 0.00e+00 | 3.96e+05 |
| Cm-244 | 5.32e+06 | 4.30e+06 | 3.41e+05 | 0.00e+00 | 1.25e+06 | 0.00e+00 | 3.83e+05 |
| Cm-245 | 8.24e+06 | 6.61e+06 | 5.18e+05 | 0.00e+00 | 2.03e+06 | 0.00e+00 | 3.57e+05 |
| Cm-246 | 8.14e+06 | 6.61e+06 | 5.18e+05 | 0.00e+00 | 2.02e+06 | 0.00e+00 | 3.51e+05 |
| Cm-247 | 7.95e+06 | 6.52e+06 | 5.08e+05 | 0.00e+00 | 1.99e+06 | 0.00e+00 | 4.62e+05 |
| Cm-248 | 6.61e+07 | 5.38e+07 | 4.21e+06 | 0.00e+00 | 1.64e+07 | 0.00e+00 | 7.45e+06 |
| Cf-252 | 5.10e+06 | 0.00e+00 | 1.23e+05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.44e+06 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# GOAT's MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Goat's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| H-3 | 0.00e+00 | 2.78e+03 | 2.78e+03 | 2.78e+03 | 2.78e+03 | 2.78e+03 | 2.78e+03 |
| Be-10 | 1.69e+06 | 2.46e+05 | 5.09e+04 | 0.00e+00 | 1.62e+05 | 0.00e+00 | 2.74e+06 |
| C-14 | 2.34e+09 | 5.00e+08 | 5.00e+08 | 5.00e+08 | 5.00e+08 | 5.00e+08 | 5.00e+08 |
| N-13 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| F-18 | 4.94e-03 | 0.00e+00 | 4.22e-04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.16e-03 |
| Na-22 | 3.82e+09 | 3.82e+09 | 3.82e+09 | 3.82e+09 | 3.82e+09 | 3.82e+09 | 3.82e+09 |
| Na-24 | 1.85e+06 | 1.85e+06 | 1.85e+06 | 1.85e+06 | 1.85e+06 | 1.85e+06 | 1.85e+06 |
| P-32 | 1.92e+11 | 1.13e+10 | 7.46e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.60e+09 |
| Ca-41 | 2.95e+09 | 0.00e+00 | 3.22e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.51e+06 |
| Sc-46 | 1.56e+02 | 2.25e+02 | 7.03e+01 | 0.00e+00 | 1.48e+02 | 0.00e+00 | 1.47e+05 |
| Cr-51 | 0.00e+00 | 0.00e+00 | 1.94e+04 | 1.26e+04 | 2.76e+03 | 2.46e+04 | 5.64e+05 |
| Mn-54 | 0.00e+00 | 4.68e+06 | 1.06e+06 | 0.00e+00 | 1.04e+06 | 0.00e+00 | 1.72e+06 |
| Mn-56 | 0.00e+00 | 3.77e-03 | 6.50e-04 | 0.00e+00 | 3.24e-03 | 0.00e+00 | 3.43e-01 |
| Fe-55 | 1.76e+06 | 1.13e+06 | 3.03e+05 | 0.00e+00 | 0.00e+00 | 5.55e+05 | 1.44e+05 |
| Fe-59 | 2.92e+06 | 5.10e+06 | 2.01e+06 | 0.00e+00 | 0.00e+00 | 1.51e+06 | 2.43e+06 |
| Co-57 | 0.00e+00 | 1.07e+06 | 1.75e+06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.66e+06 |
| Co-58 | 0.00e+00 | 2.91e+06 | 7.26e+06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.25e+06 |
| Co-60 | 0.00e+00 | 1.06e+07 | 2.50e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.52e+07 |
| Ni-59 | 3.13e+08 | 9.59e+07 | 5.40e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.74e+06 |
| Ni-63 | 4.19e+09 | 2.59e+08 | 1.45e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.29e+07 |
| Ni-65 | 4.27e-01 | 4.83e-02 | 2.20e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.68e+00 |
| Cu-64 | 0.00e+00 | 2.07e+04 | 9.60e+03 | 0.00e+00 | 3.51e+04 | 0.00e+00 | 4.26e+05 |
| Zn-65 | 6.66e+08 | 2.28e+09 | 1.05e+09 | 0.00e+00 | 1.11e+09 | 0.00e+00 | 1.93e+09 |
| Zn-69 | 2.52e-12 | 4.54e-12 | 3.38e-13 | 0.00e+00 | 1.89e-12 | 0.00e+00 | 3.70e-10 |
| Zn-69m | 2.04e+05 | 4.17e+05 | 3.80e+04 | 0.00e+00 | 1.69e+05 | 0.00e+00 | 5.78e+06 |
| Se-79 | 0.00e+00 | 9.33e+08 | 1.73e+08 | 0.00e+00 | 1.08e+09 | 0.00e+00 | 2.48e+07 |
| Br-82 | 0.00e+00 | 0.00e+00 | 2.32e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-83 | 0.00e+00 | 0.00e+00 | 1.14e-01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-84 | 0.00e+00 | 0.00e+00 | 1.62e-23 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-85 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# GOAT's MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Goat's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Rb-86 | 0.00e+00 | 2.67e+09 | 1.32e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.83e+07 |
| Rb-87 | 0.00e+00 | 2.63e+09 | 1.04e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.77e+07 |
| Rb-88 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Rb-89 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sr-89 | 2.64e+10 | 0.00e+00 | 7.58e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.43e+08 |
| Sr-90 | 3.91e+11 | 0.00e+00 | 7.92e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.19e+09 |
| Sr-91 | 5.73e+05 | 0.00e+00 | 2.07e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.78e+05 |
| Sr-92 | 9.89e+00 | 0.00e+00 | 3.67e-01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.07e+02 |
| Y-90 | 8.18e+01 | 0.00e+00 | 2.19e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.13e+05 |
| Y-91 | 8.79e+03 | 0.00e+00 | 2.34e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.30e+05 |
| Y-91m | 7.13e-20 | 0.00e+00 | 2.43e-21 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.38e-16 |
| Y-92 | 6.52e-05 | 0.00e+00 | 1.83e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.24e+00 |
| Y-93 | 2.60e-01 | 0.00e+00 | 7.08e-03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.05e+03 |
| Zr-93 | 9.53e+02 | 4.54e+01 | 2.73e+01 | 0.00e+00 | 1.34e+02 | 0.00e+00 | 1.18e+04 |
| Zr-95 | 8.16e+02 | 1.99e+02 | 1.41e+02 | 0.00e+00 | 2.14e+02 | 0.00e+00 | 9.91e+04 |
| Zr-97 | 4.89e-01 | 8.38e-02 | 3.83e-02 | 0.00e+00 | 8.45e-02 | 0.00e+00 | 5.35e+03 |
| Nb-93m | 3.03e+05 | 8.19e+04 | 2.56e+04 | 0.00e+00 | 8.00e+04 | 0.00e+00 | 9.79e+06 |
| Nb-95 | 7.12e+04 | 2.93e+04 | 1.70e+04 | 0.00e+00 | 2.10e+04 | 0.00e+00 | 2.48e+07 |
| Nb-97 | 7.39e-12 | 1.58e-12 | 5.68e-13 | 0.00e+00 | 1.23e-12 | 0.00e+00 | 4.97e-07 |
| Mo-93 | 0.00e+00 | 4.18e+08 | 1.35e+07 | 0.00e+00 | 8.37e+07 | 0.00e+00 | 8.96e+06 |
| Mo-99 | 0.00e+00 | 2.50e+07 | 4.87e+06 | 0.00e+00 | 3.73e+07 | 0.00e+00 | 8.23e+06 |
| Tc-101 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Tc-99 | 2.67e+07 | 3.60e+07 | 1.12e+07 | 0.00e+00 | 3.04e+08 | 3.50e+06 | 1.56e+08 |
| Tc-99m | 3.32e+00 | 6.84e+00 | 8.82e+01 | 0.00e+00 | 7.36e+01 | 3.58e+00 | 1.99e+03 |
| Ru-103 | 1.04e+03 | 0.00e+00 | 3.48e+02 | 0.00e+00 | 2.17e+03 | 0.00e+00 | 1.27e+04 |
| Ru-105 | 9.75e-04 | 0.00e+00 | 3.28e-04 | 0.00e+00 | 7.17e-03 | 0.00e+00 | 3.88e-01 |
| Ru-106 | 2.28e+04 | 0.00e+00 | 2.85e+03 | 0.00e+00 | 2.70e+04 | 0.00e+00 | 1.73e+05 |
| Rh-105 | 3.98e+05 | 2.60e+05 | 1.75e+05 | 0.00e+00 | 7.23e+05 | 0.00e+00 | 6.47e+06 |
| Pd-107 | 0.00e+00 | 1.17e+07 | 8.34e+05 | 0.00e+00 | 6.70e+07 | 0.00e+00 | 9.34e+06 |
| Pd-109 | 0.00e+00 | 4.86e+04 | 1.17e+04 | 0.00e+00 | 1.79e+05 | 0.00e+00 | 1.19e+06 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# GOAT's MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Goat's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ag-110m | 4.63e+07 | 3.38e+07 | 2.24e+07 | 0.00e+00 | 4.83e+07 | 0.00e+00 | 1.75e+09 |
| Ag-111 | 7.40e+06 | 2.88e+06 | 1.52e+06 | 0.00e+00 | 6.01e+06 | 0.00e+00 | 6.86e+08 |
| Cd-113m | 0.00e+00 | 2.09e+06 | 7.70e+04 | 0.00e+00 | 1.58e+06 | 0.00e+00 | 3.14e+06 |
| Cd-115m | 0.00e+00 | 1.24e+06 | 4.31e+04 | 0.00e+00 | 6.48e+05 | 0.00e+00 | 7.07e+06 |
| Sn-123 | 5.48e+08 | 8.57e+06 | 1.43e+07 | 8.61e+06 | 0.00e+00 | 0.00e+00 | 1.45e+08 |
| Sn-125 | 6.45e+07 | 1.20e+06 | 2.86e+06 | 1.18e+06 | 0.00e+00 | 0.00e+00 | 9.66e+07 |
| Sn-126 | 1.36e+09 | 1.79e+07 | 4.44e+07 | 4.71e+06 | 0.00e+00 | 0.00e+00 | 6.22e+07 |
| Sb-124 | 2.51e+07 | 3.70e+05 | 7.78e+06 | 6.67e+04 | 0.00e+00 | 1.57e+07 | 7.75e+07 |
| Sb-125 | 1.79e+07 | 1.74e+05 | 3.69e+06 | 2.25e+04 | 0.00e+00 | 1.04e+07 | 2.39e+07 |
| Sb-126 | 5.04e+06 | 9.88e+04 | 1.82e+06 | 3.87e+04 | 0.00e+00 | 3.17e+06 | 5.22e+07 |
| Sb-127 | 5.01e+05 | 8.93e+03 | 1.55e+05 | 6.37e+03 | 0.00e+00 | 2.58e+05 | 1.33e+07 |
| Te-125m | 1.81e+07 | 6.05e+06 | 2.45e+06 | 6.09e+06 | 0.00e+00 | 0.00e+00 | 8.62e+06 |
| Te-127 | 7.61e+02 | 2.55e+02 | 1.64e+02 | 6.20e+02 | 1.86e+03 | 0.00e+00 | 1.60e+04 |
| Te-127m | 5.05e+07 | 1.68e+07 | 6.12e+06 | 1.46e+07 | 1.24e+08 | 0.00e+00 | 2.04e+07 |
| Te-129 | 3.37e-10 | 1.16e-10 | 7.87e-11 | 2.83e-10 | 8.40e-10 | 0.00e+00 | 2.70e-08 |
| Te-129m | 6.69e+07 | 2.29e+07 | 1.03e+07 | 2.57e+07 | 1.67e+08 | 0.00e+00 | 3.99e+07 |
| Te-131 | 4.51e-33 | 1.67e-33 | 1.27e-33 | 4.02e-33 | 1.15e-32 | 0.00e+00 | 1.82e-31 |
| Te-131m | 4.06e+05 | 1.63e+05 | 1.35e+05 | 3.31e+05 | 1.12e+06 | 0.00e+00 | 2.75e+06 |
| Te-132 | 2.53e+06 | 1.25e+06 | 1.17e+06 | 1.85e+06 | 7.84e+06 | 0.00e+00 | 4.64e+06 |
| Te-133m | 2.37e-13 | 1.09e-13 | 1.04e-13 | 2.09e-13 | 7.40e-13 | 0.00e+00 | 1.17e-11 |
| Te-134 | 9.91e-19 | 4.97e-19 | 5.12e-19 | 8.87e-19 | 3.35e-18 | 0.00e+00 | 1.14e-17 |
| I-129 | 8.47e+08 | 6.28e+08 | 4.59e+08 | 4.03e+11 | 7.43e+08 | 0.00e+00 | 1.26e+07 |
| I-130 | 4.27e+05 | 9.40e+05 | 3.77e+05 | 1.05e+08 | 1.03e+06 | 0.00e+00 | 2.01e+05 |
| I-131 | 3.26e+08 | 3.85e+08 | 1.69e+08 | 1.26e+11 | 4.49e+08 | 0.00e+00 | 1.37e+07 |
| I-132 | 1.74e-01 | 3.54e-01 | 1.26e-01 | 1.66e+01 | 3.95e-01 | 0.00e+00 | 2.87e-01 |
| I-133 | 4.36e+06 | 6.35e+06 | 1.86e+06 | 1.15e+09 | 7.46e+06 | 0.00e+00 | 1.07e+06 |
| I-134 | 2.21e-12 | 4.52e-12 | 1.61e-12 | 1.05e-10 | 5.05e-12 | 0.00e+00 | 4.67e-12 |
| I-135 | 1.36e+04 | 2.70e+04 | 9.83e+03 | 2.42e+06 | 3.00e+04 | 0.00e+00 | 9.76e+03 |
| Cs-134 | 1.09e+11 | 2.04e+11 | 2.06e+10 | 0.00e+00 | 5.25e+10 | 2.15e+10 | 5.54e+08 |
| Cs-134m | 4.64e+00 | 7.73e+00 | 3.90e+00 | 0.00e+00 | 2.98e+00 | 6.86e-01 | 6.12e+00 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# GOAT's MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Goat's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Cs-135 | 3.94e+10 | 3.58e+10 | 1.87e+09 | 0.00e+00 | 1.02e+10 | 3.88e+09 | 1.29e+08 |
| Cs-136 | 5.93e+09 | 1.74e+10 | 6.51e+09 | 0.00e+00 | 6.95e+09 | 1.42e+09 | 2.65e+08 |
| Cs-137 | 1.54e+11 | 1.81e+11 | 1.28e+10 | 0.00e+00 | 4.85e+10 | 1.96e+10 | 5.65e+08 |
| Cs-138 | 2.70e-22 | 4.40e-22 | 2.13e-22 | 0.00e+00 | 2.19e-22 | 3.42e-23 | 7.03e-22 |
| Cs-139 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-139 | 5.27e-08 | 3.49e-11 | 1.53e-09 | 0.00e+00 | 2.10e-11 | 2.12e-11 | 3.34e-06 |
| Ba-140 | 2.89e+07 | 2.89e+04 | 1.49e+06 | 0.00e+00 | 6.87e+03 | 1.78e+04 | 7.10e+06 |
| Ba-141 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-142 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| La-140 | 4.87e+00 | 1.92e+00 | 4.94e-01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.25e+04 |
| La-141 | 3.47e-05 | 1.01e-05 | 1.75e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.15e+00 |
| La-142 | 2.09e-11 | 7.67e-12 | 1.84e-12 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.30e-06 |
| Ce-141 | 5.20e+03 | 3.17e+03 | 3.74e+02 | 0.00e+00 | 9.79e+02 | 0.00e+00 | 1.64e+06 |
| Ce-143 | 4.77e+01 | 3.16e+04 | 3.61e+00 | 0.00e+00 | 9.21e+00 | 0.00e+00 | 1.85e+05 |
| Ce-144 | 2.79e+05 | 1.14e+05 | 1.56e+04 | 0.00e+00 | 4.62e+04 | 0.00e+00 | 1.60e+07 |
| Pr-143 | 1.78e+02 | 6.67e+01 | 8.84e+00 | 0.00e+00 | 2.48e+01 | 0.00e+00 | 9.41e+04 |
| Pr-144 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Nd-147 | 1.06e+02 | 1.09e+02 | 6.65e+00 | 0.00e+00 | 4.19e+01 | 0.00e+00 | 6.88e+04 |
| Pm-147 | 1.88e+03 | 1.59e+02 | 7.72e+01 | 0.00e+00 | 2.37e+02 | 0.00e+00 | 4.50e+04 |
| Pm-148 | 6.68e+01 | 9.65e+00 | 4.86e+00 | 0.00e+00 | 1.15e+01 | 0.00e+00 | 1.03e+05 |
| Pm-148m | 5.88e+02 | 1.49e+02 | 1.17e+02 | 0.00e+00 | 1.71e+02 | 0.00e+00 | 1.94e+05 |
| Pm-149 | 4.96e+00 | 6.50e-01 | 2.84e-01 | 0.00e+00 | 7.91e-01 | 0.00e+00 | 1.75e+04 |
| Pm-151 | 7.32e-01 | 1.07e-01 | 5.40e-02 | 0.00e+00 | 1.27e-01 | 0.00e+00 | 4.94e+03 |
| Sm-151 | 1.43e+03 | 3.29e+02 | 7.10e+01 | 0.00e+00 | 2.24e+02 | 0.00e+00 | 2.75e+04 |
| Sm-153 | 2.29e+00 | 1.77e+00 | 1.36e-01 | 0.00e+00 | 3.71e-01 | 0.00e+00 | 9.25e+03 |
| Eu-152 | 3.32e+03 | 8.81e+02 | 7.43e+02 | 0.00e+00 | 2.47e+03 | 0.00e+00 | 7.82e+04 |
| Eu-154 | 1.30e+04 | 1.81e+03 | 1.09e+03 | 0.00e+00 | 4.91e+03 | 0.00e+00 | 2.26e+05 |
| Eu-155 | 2.61e+03 | 3.01e+02 | 1.56e+02 | 0.00e+00 | 6.75e+02 | 0.00e+00 | 4.04e+05 |
| Eu-156 | 2.67e+02 | 1.66e+02 | 2.63e+01 | 0.00e+00 | 7.65e+01 | 0.00e+00 | 1.56e+05 |
| Tb-160 | 1.05e+03 | 0.00e+00 | 1.31e+02 | 0.00e+00 | 2.99e+02 | 0.00e+00 | 1.40e+05 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

Ri factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Goat's Milk Pathway Ri

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ho-166m | 6.17e+03 | 1.33e+03 | 1.05e+03 | 0.00e+00 | 1.76e+03 | 0.00e+00 | 1.31e+05 |
| W-181 | 3.87e+04 | 1.19e+04 | 1.33e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.67e+05 |
| W-185 | 1.48e+06 | 4.62e+05 | 5.27e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.62e+06 |
| W-187 | 7.31e+03 | 5.08e+03 | 1.76e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.99e+05 |
| Pb-210 | 3.23e+10 | 8.67e+09 | 1.45e+09 | 0.00e+00 | 2.64e+10 | 0.00e+00 | 1.42e+06 |
| Bi-210 | 4.10e+05 | 2.64e+06 | 2.36e+05 | 0.00e+00 | 2.05e+07 | 0.00e+00 | 5.20e+06 |
| Po-210 | 8.25e+08 | 1.58e+09 | 1.97e+08 | 0.00e+00 | 3.35e+09 | 0.00e+00 | 1.76e+07 |
| Ra-223 | 1.38e+11 | 2.02e+08 | 2.77e+10 | 0.00e+00 | 3.67e+09 | 0.00e+00 | 1.08e+09 |
| Ra-224 | 1.64e+10 | 3.69e+07 | 3.26e+09 | 0.00e+00 | 6.72e+08 | 0.00e+00 | 4.33e+08 |
| Ra-225 | 2.14e+11 | 2.41e+08 | 4.25e+10 | 0.00e+00 | 4.40e+09 | 0.00e+00 | 1.20e+09 |
| Ra-226 | 4.90e+12 | 3.76e+08 | 4.06e+12 | 0.00e+00 | 6.88e+09 | 0.00e+00 | 2.72e+09 |
| Ra-228 | 3.39e+12 | 2.02e+08 | 3.81e+12 | 0.00e+00 | 3.71e+09 | 0.00e+00 | 4.59e+08 |
| Ac-225 | 7.02e+04 | 9.01e+04 | 4.71e+03 | 0.00e+00 | 6.61e+03 | 0.00e+00 | 7.81e+05 |
| Ac-227 | 2.21e+07 | 3.78e+06 | 1.37e+06 | 0.00e+00 | 7.69e+05 | 0.00e+00 | 4.19e+05 |
| Th-227 | 3.13e+05 | 5.24e+03 | 8.99e+03 | 0.00e+00 | 1.93e+04 | 0.00e+00 | 1.49e+06 |
| Th-228 | 1.19e+07 | 1.63e+05 | 4.04e+05 | 0.00e+00 | 7.63e+05 | 0.00e+00 | 2.82e+06 |
| Th-229 | 1.24e+08 | 3.12e+06 | 2.07e+06 | 0.00e+00 | 1.50e+07 | 0.00e+00 | 4.00e+05 |
| Th-230 | 1.88e+07 | 9.38e+05 | 5.23e+05 | 0.00e+00 | 4.50e+06 | 0.00e+00 | 3.08e+05 |
| Th-232 | 2.09e+07 | 8.05e+05 | 8.14e+03 | 0.00e+00 | 3.85e+06 | 0.00e+00 | 2.62e+05 |
| Th-234 | 2.04e+03 | 1.11e+02 | 5.90e+01 | 0.00e+00 | 4.10e+02 | 0.00e+00 | 3.51e+05 |
| Pa-231 | 3.74e+07 | 1.23e+06 | 1.49e+06 | 0.00e+00 | 6.61e+06 | 0.00e+00 | 3.67e+05 |
| Pa-233 | 9.66e+01 | 1.89e+01 | 1.69e+01 | 0.00e+00 | 5.19e+01 | 0.00e+00 | 4.53e+04 |
| U-232 | 1.19e+10 | 0.00e+00 | 1.07e+09 | 0.00e+00 | 1.17e+09 | 0.00e+00 | 3.47e+07 |
| U-233 | 2.51e+09 | 0.00e+00 | 1.91e+08 | 0.00e+00 | 5.33e+08 | 0.00e+00 | 3.21e+07 |
| U-234 | 2.41e+09 | 0.00e+00 | 1.88e+08 | 0.00e+00 | 5.23e+08 | 0.00e+00 | 3.14e+07 |
| U-235 | 2.31e+09 | 0.00e+00 | 1.76e+08 | 0.00e+00 | 4.90e+08 | 0.00e+00 | 4.00e+07 |
| U-236 | 2.31e+09 | 0.00e+00 | 1.80e+08 | 0.00e+00 | 4.99e+08 | 0.00e+00 | 2.95e+07 |
| U-237 | 6.47e+04 | 0.00e+00 | 1.73e+04 | 0.00e+00 | 1.61e+05 | 0.00e+00 | 2.76e+06 |
| U-238 | 2.21e+09 | 0.00e+00 | 1.64e+08 | 0.00e+00 | 4.58e+08 | 0.00e+00 | 2.82e+07 |
| Np-237 | 1.18e+07 | 7.85e+05 | 5.18e+05 | 0.00e+00 | 3.13e+06 | 0.00e+00 | 4.06e+05 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

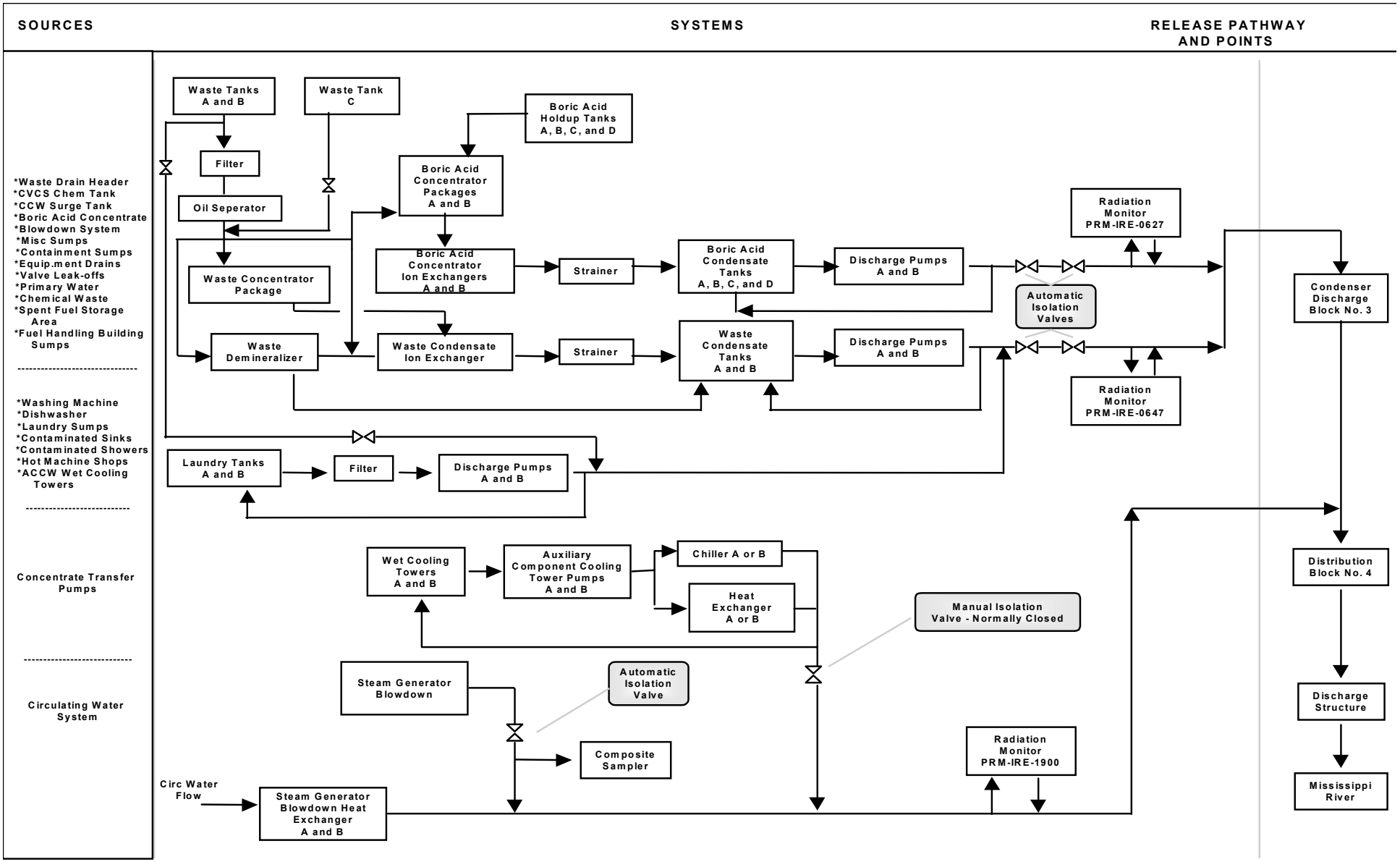
# GOAT's MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Gaseous Release Goat's Milk Pathway Ri

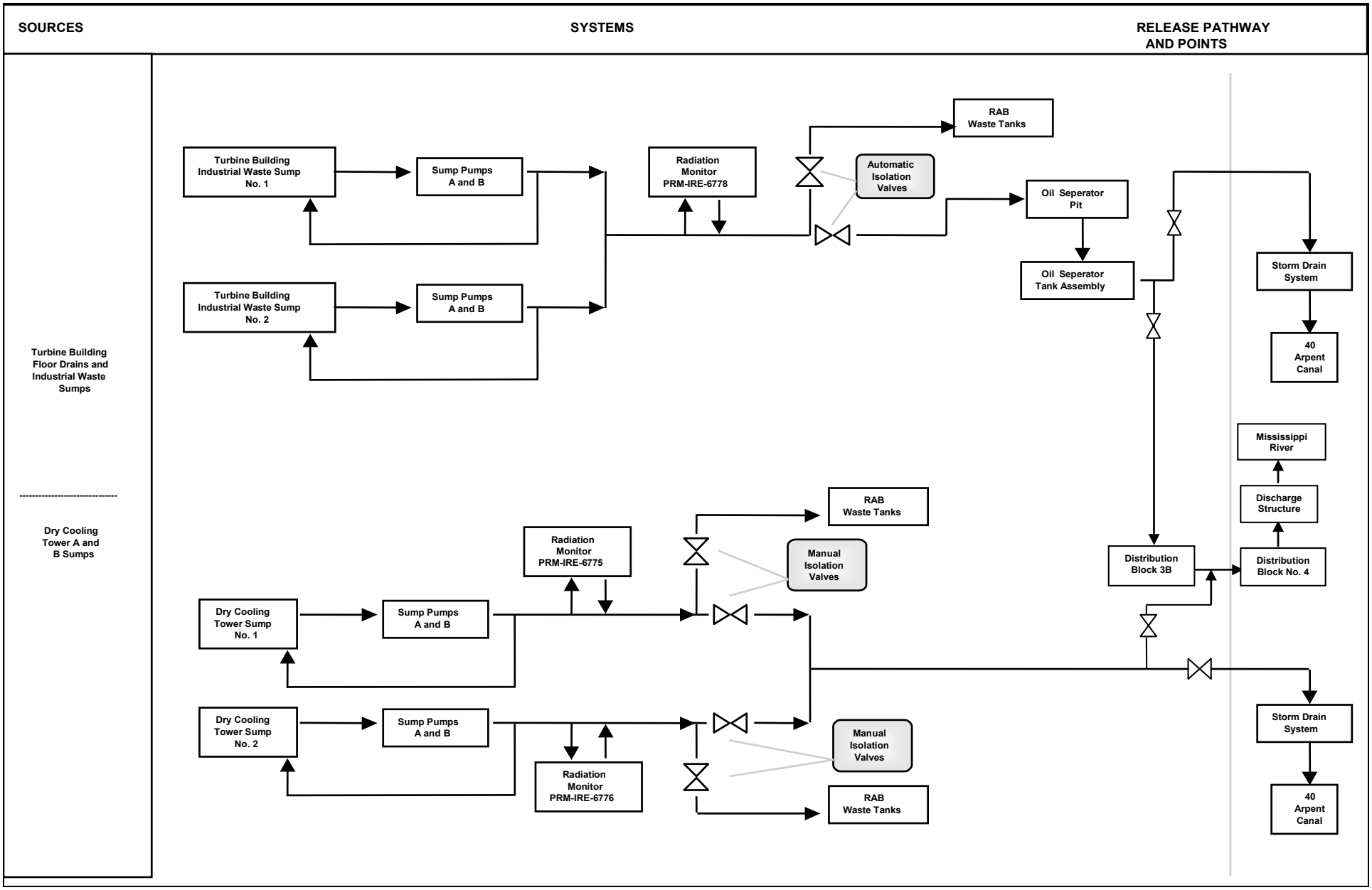
| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Np-238 | 4.19e+01 | 1.05e+00 | 6.48e-01 | 0.00e+00 | 2.30e+00 | 0.00e+00 | 1.41e+04 |
| Np-239 | 4.38e+00 | 3.92e-01 | 2.21e-01 | 0.00e+00 | 7.81e-01 | 0.00e+00 | 1.13e+04 |
| Pu-238 | 2.53e+06 | 2.96e+05 | 6.71e+04 | 0.00e+00 | 2.39e+05 | 0.00e+00 | 1.49e+05 |
| Pu-239 | 2.72e+06 | 3.06e+05 | 6.99e+04 | 0.00e+00 | 2.53e+05 | 0.00e+00 | 1.36e+05 |
| Pu-240 | 2.72e+06 | 3.06e+05 | 6.99e+04 | 0.00e+00 | 2.53e+05 | 0.00e+00 | 1.39e+05 |
| Pu-241 | 8.37e+04 | 3.47e+03 | 1.74e+03 | 0.00e+00 | 6.24e+03 | 0.00e+00 | 2.86e+03 |
| Pu-242 | 2.53e+06 | 2.94e+05 | 6.73e+04 | 0.00e+00 | 2.43e+05 | 0.00e+00 | 1.34e+05 |
| Pu-244 | 2.94e+06 | 3.38e+05 | 7.72e+04 | 0.00e+00 | 2.78e+05 | 0.00e+00 | 1.99e+05 |
| Am-241 | 7.14e+06 | 6.21e+06 | 5.33e+05 | 0.00e+00 | 3.20e+06 | 0.00e+00 | 3.76e+05 |
| Am-242m | 7.45e+06 | 6.02e+06 | 5.58e+05 | 0.00e+00 | 3.28e+06 | 0.00e+00 | 4.78e+05 |
| Am-243 | 7.11e+06 | 6.07e+06 | 5.23e+05 | 0.00e+00 | 3.14e+06 | 0.00e+00 | 4.46e+05 |
| Cm-242 | 6.17e+05 | 5.72e+05 | 4.10e+04 | 0.00e+00 | 1.18e+05 | 0.00e+00 | 3.71e+05 |
| Cm-243 | 6.90e+06 | 5.67e+06 | 4.43e+05 | 0.00e+00 | 1.61e+06 | 0.00e+00 | 3.99e+05 |
| Cm-244 | 5.81e+06 | 4.78e+06 | 3.74e+05 | 0.00e+00 | 1.33e+06 | 0.00e+00 | 3.86e+05 |
| Cm-245 | 8.84e+06 | 7.16e+06 | 5.58e+05 | 0.00e+00 | 2.13e+06 | 0.00e+00 | 3.60e+05 |
| Cm-246 | 8.74e+06 | 7.16e+06 | 5.58e+05 | 0.00e+00 | 2.13e+06 | 0.00e+00 | 3.54e+05 |
| Cm-247 | 8.54e+06 | 7.06e+06 | 5.48e+05 | 0.00e+00 | 2.09e+06 | 0.00e+00 | 4.65e+05 |
| Cm-248 | 7.06e+07 | 5.82e+07 | 4.52e+06 | 0.00e+00 | 1.73e+07 | 0.00e+00 | 7.50e+06 |
| Cf-252 | 5.92e+06 | 0.00e+00 | 1.43e+05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.45e+06 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# LIQUID WASTE MANAGEMENT SYSTEM EFFLUENT SOURCES AND RELEASE PATHWAYS AND POINTS



# LIQUID WASTE MANAGEMENT SYSTEM EFFLUENT SOURCES AND RELEASE PATHWAYS AND POINTS

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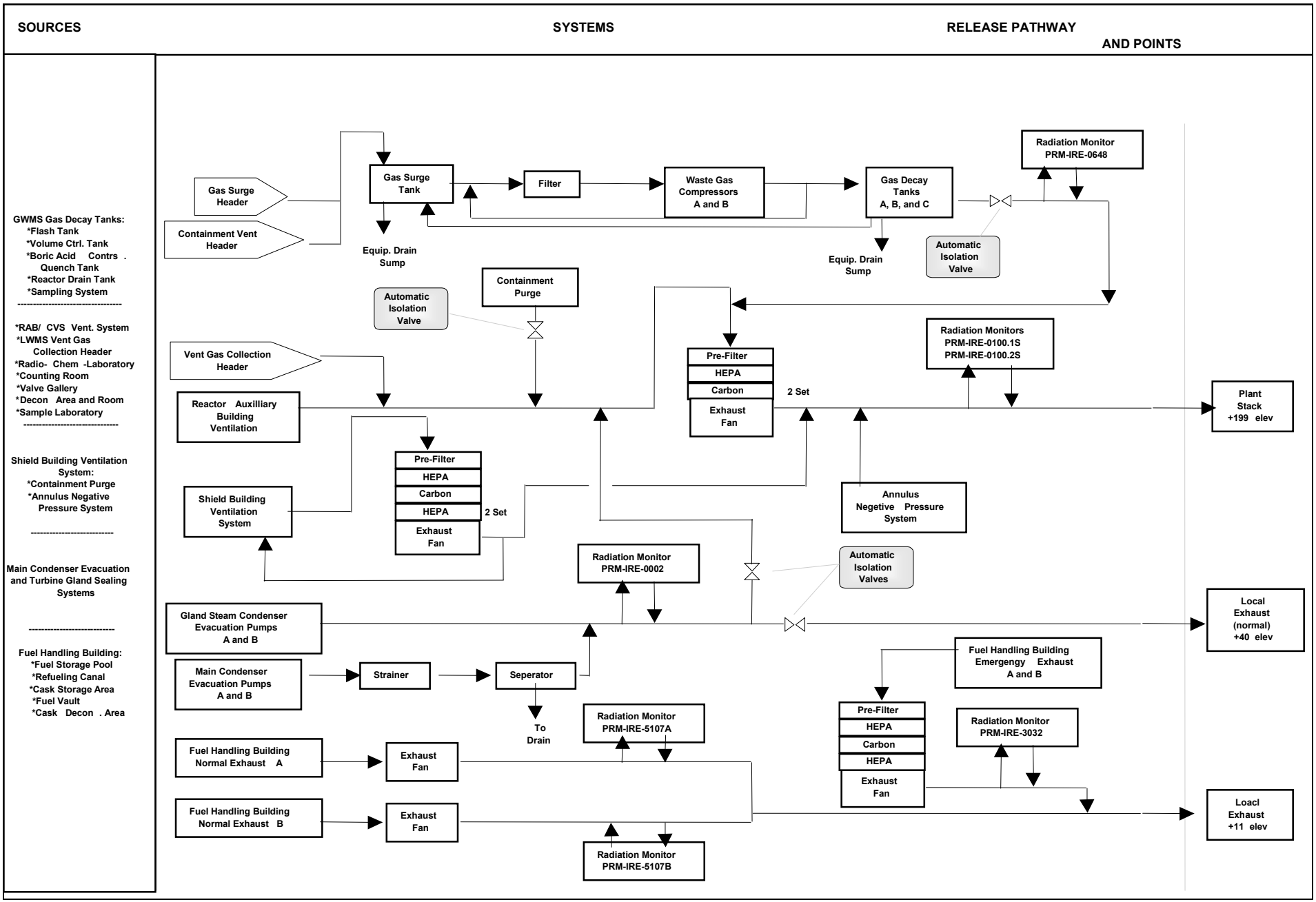
# GASEOUS EFFLUENT SOURCES, GASEOUS WASTE MANAGEMENT SYSTEM EFFLUENT SOURCES AND EXHAUST RELEASE POINTS



# RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

| EXPOSURE PATHWAY AND/OR SAMPLE | NUMBER OF REPRESENTATIVE SAMPLES AND SAMPLE LOCATIONS | SAMPLING AND COLLECTION FREQUENCY* | TYPE AND FREQUENCY OF ANALYSIS | VOLUME** |
|---|---|---|---|---|
| TLD | A-2, B-1, C-1, D-2, E-1, F-2, G-2, H-2, J-2, K-1, L-1, M-1, N-1, P-1, Q-1, R-1, A-5, B-4, D-5, E-5, F-4, G-4, H-8, P-6, Q-5, R-6, F-9, G-8, E-15, J-15, E-30 | Quarterly | TLD (1)<br>gamma dose quarterly | N/A |
| RADIOIODINE AND PARTICULATES | APF-1, APQ-1, APP-1<br>APC-1, APE-30 | Bi-Weekly | gross beta (2) , I-131 bi-weekly | 285 $m^3$ /wk |
| | | Quarterly Composite | gamma isotopic (2) quarterly | 3700 $m^3$ / qtr |
| DRINKING WATER / SURFACE WATER (3) | DWF-2 (4) / SWF-2 (4)<br>DWE-5 (4) / SWE-5 (4)<br>DWP-7 / SWP-7<br>SWK-1 (12)(13) | Quarterly Composite (5) | H-3<br>gross beta, gamma isotopic quarterly | Homogeneous<br>8 liters |
| | | Monthly Composite (10) | I-131 (7) monthly | |
| SHORELINE SEDIMENT | SHWK-1, SHWE-3, SHWQ-6 | Annually | gamma isotopic annually | 2 kilograms |
| MILK | MKE-3, MKA-31 | Quarterly | gamma isotopic, I-131quarterly | 8 liters |
| FISH | FH-1, FH-2, FH-3 | In season or Annually(9) | gamma isotopic annually | 500 grams |
| BROAD LEAF | BLQ-1, BLB-1, BLE-20 | Quarterly | gamma isotopic, I-131quarterly | 500 grams |
| SANITARY SYSTEM (11) | SWR-1 | Monthly Composite (10) | gamma isotopic monthly | Homogeneous<br>4 liters |
| | | Quarterly Composite (5) | H-3 quarterly | |

* Sample collection at specific locations may be increased at any time in order to increase the effectiveness of the REMP.

** These are typical volumes used to meet LLDs. Actual volumes are used in the calculations.

# RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

1. One or more instrument, such as a pressurized ion chamber, for measuring and recording dose rate continuously may be used in place of, or in addition to, integrating dosimeters. A TLD is considered one phosphor, two or more phosphors in a packet are considered two or more dosimeters. Geographical limitations affect siting of dosimeters.

2. Airborne particulate sample filters shall be analyzed for gross beta radioactivity 24 hours or more after sampling to allow for radon and thoron daughter decay. If gross beta activity in air particulate samples is greater than ten times the yearly mean of control samples, gamma isotopic analysis shall be performed on the individual samples. Gamma isotopic analysis means the identification and quantification of gamma-emitting radionuclides that may be attributable to the effluents from the facility.

3. Drinking Water and Surface Water samples are identical where designated.

4. The downstream sample is beyond the mixing zone.

5. A composite sample will contain aliquots of sample taken proportional to the quantity of flowing liquid that results in a specimen representative of the liquid flow.

6. DELETED

7. This analysis will be performed when the dose calculated for the consumption of water is greater than 1 mrem per year as calculated for maximum organ and age group.

8. DELETED

9. Striped mullet, gizzard shad, freshwater drum, and catfish will be collected. <u>If</u> they are not available, <u>then</u> substitute species will be collected and identified in reporting.

10. An analysis frequency of every 4 weeks satisfies this requirement. The maximum frequency is monthly.

11. Sanitary System Sampling and analysis performed additionally for this location. This sampling requirement is not derived directly from REMP requirements, but it represents another possible environmental interface with the plant. Information from this sample location will not normally be included in the Annual Radiological Environmental Operating Report.

12. Monthly composite is analyzed for gamma isotopic.

13. Gross beta is <u>not</u> required for surface water in accordance with TRM Table 3.12-1.

SAMPLE LOCATION TABLE

| LOCATION NUMBER | LOCATION DESCRIPTION | BEARING/ MILES TO PLANT | sition Latitude Longitude |
|---|---|---|---|
| | **DIRECT RADIATION (TLD)** | | |
| A-2 | (Eastbank) Located on pole on LA 628 at Zephirin L. Periloux Fire House. | 188°<br>1.27 | N 30.01381<br>W 90.46780 |
| B-1 | (Eastbank) Located on fence west of Little Gyspy. | 200°<br>0.75 | N 30.00576<br>W 90.46672 |
| C-1 | (Eastbank) Located on fence at Little Gyspy Cooling Water Intake structure. | 219°<br>0.67 | N 30.00307<br>W 90.46401 |
| D-2 | (Eastbank) Located on pole on levee at west entrance to Bonnet Carre Spillway. | 238°<br>1.24 | N 30.00471<br>W 90.45343 |

# RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

SAMPLE LOCATION TABLE (Continued)

| LOCATION NUMBER | LOCATION DESCRIPTION | BEARING/ MILES TO PLANT | Position Latitude Longitude |
|---|---|---|---|
| | **DIRECT RADIATION (TLD) (continued)** | | |
| E-1 | (Westbank) Located on pole on LA 18 east of Waterford 3 plant entrance. | 277°<br>0.41 | N 29.99468<br>W 90.46437 |
| F-2 | (Westbank) Located on fence on LA 3142 south of LA 18. | 294°<br>1.15 | N 29.98842<br>W 90.45387 |
| G-2 | (Westbank) Located on fence on LA 3142 north of railroad overpass. | 309°<br>1.26 | N 29.98371<br>W 90.45498 |
| H-2 | (Westbank) Located on fence on LA 3142 north of LA 3127/3142 intersection. | 327°<br>1.54 | N 29.97659<br>W 90.45753 |

# RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

SAMPLE LOCATION TABLE (Continued)

| LOCATION NUMBER | LOCATION DESCRIPTION | BEARING/ MILES TO PLANT | Position Latitude Longitude |
|---|---|---|---|
| | **DIRECT RADIATION (TLD) (continued)** | | |
| J-2 | (Westbank) Located on fence south of LA 3127 west of LA 3127/3142 intersection. | 356°<br>1.38 | N 29.97546<br>W 90.47003 |
| K-1 | (Westbank) Located on stop sign at entrance to Entergy Education Center on LA 3127. | 23°<br>1.06 | N 29.98153<br>W 90.47843 |
| L-1 | (Westbank) Located on gate on LA 3127 west of LA 3127/3142 intersection. | 42°<br>1.06 | N 29.98427<br>W 90.48314 |
| M-1 | (Westbank) Located on south gate of Waterford 1 and 2. | 67°<br>0.76 | N 29.99148<br>W 90.48286 |
| N-1 | (Westbank) Located on pole at corner of Railroad Avenue and School House Road. | 93°<br>0.98 | N 29.99649<br>W 90.48739 |

# RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

SAMPLE LOCATION TABLE (Continued)

| LOCATION NUMBER | LOCATION DESCRIPTION | BEARING/ MILES TO PLANT | Position Latitude Longitude |
|---|---|---|---|
| | **DIRECT RADIATION (TLD) (continued)** | | |
| P-1 | (Westbank) Located on fence enclosing air sample station APP-1. | 119°<br>0.84 | N 30.00158<br>W 90.48323 |
| Q-1 | (Westbank) Located on fence enclosing air sample station APQ-1. | 132°<br>0.81 | N 30.00355<br>W 90.48091 |
| R-1 | (Westbank) Located at Waterford 1 and 2 Cooling Water Intake Structure. | 147°<br>0.51 | N 30.00181<br>W 90.47564 |
| A-5 | (Eastbank) Located on pole at intersection of Oswald Avenue and US 61. | 177°<br>4.59 | N 30.06212<br>W 90.47334 |
| B-4 | (Eastbank) Located on pole near weigh station on US 61. | 197°<br>3.75 | N 30.04717<br>W 90.45130 |

# RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

SAMPLE LOCATION TABLE (Continued)

| LOCATION NUMBER | LOCATION<br><br>DESCRIPTION | BEARING/ MILES TO PLANT | Position Latitude Longitude |
|---|---|---|---|
| | **DIRECT RADIATION (TLD) (continued)** | | |
| D-5 | (Eastbank) Located on gate on shell road north of US 61/LA 48 intersection. | 249°<br>4.09 | N 30.01628<br>W 90.40730 |
| E-5 | (Eastbank) Located on fence on Wesco St. off LA 48. | 266°<br>4.08 | N 29.99840<br>W 90.40314 |
| F-4 | (Westbank) Located on pole behind house at 646 Aquarius St. in Hahnville. | 289°<br>3.53 | N 29.97818<br>W 90.41582 |
| G-4 | (Westbank) Located on pole on LA 3160 north of railroad track. | 309°<br>3.30 | N 29.96507<br>W 90.42867 |

# RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

SAMPLE LOCATION TABLE (Continued)

| LOCATION NUMBER | LOCATION DESCRIPTION | BEARING/ MILES TO PLANT | Position Latitude Longitude |
|---|---|---|---|
| | **DIRECT RADIATION (TLD) (continued)** | | |
| H-8 | (Westbank) Located on pole in front of Hahnville High School. | 331°<br>8.13 | N 29.89178<br>W 90.40725 |
| P-6 | (Westbank) Located on fence at LA 640/railroad track intersection. | 107°<br>5.58 | N 30.02121<br>W 90.55941 |
| Q-5 | (Westbank) Located on pole on LA 18 across from Mississippi River marker 137. | 129°<br>5.01 | N 30.04274<br>W 90.53464 |
| R-6 | (Eastbank) Located on fence on LA 3223 near railroad crossing. | 160°<br>5.52 | N 30.07108<br>W 90.50183 |
| F-9 | (Eastbank) Located on fence north of railroad tracks on Jonathan St. | 294°<br>8.18 | N 29.94563<br>W 90.34739 |

# RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

SAMPLE LOCATION TABLE (Continued)

| LOCATION NUMBER | LOCATION DESCRIPTION | BEARING/ MILES TO PLANT | Position Latitude Longitude |
|---|---|---|---|
| | DIRECT RADIATION (TLD) (continued) | | |
| G-8 | (Westbank) Located on back fence of Luling Entergy office. | 305°<br>7.74 | N 29.93055<br>W 90.36592 |
| E-15 | (Eastbank) Located on fence on Alliance Avenue. | 275°<br>11.7 | N 29.97695<br>W 90.27658 |
| J-15 | (Westbank) Located on pole near LA 631/Hwy 90 intersection in Des Allemands. | 357°<br>11.7 | N 29.82575<br>W 90.46457 |
| E-30* | (Westbank) Located at entrance to Entergy office on Delaronde St. in Algiers. | 276°<br>25.2 | N 29.95233<br>W 90.05441 |

* DENOTES CONTROL LOCATIONS

# RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

SAMPLE LOCATION TABLE (Continued)

| LOCATION NUMBER | LOCATION DESCRIPTION | BEARING/ MILES TO PLANT | Position Latitude Longitude |
|---|---|---|---|
| | **AIRBORNE** | | |
| APP-1 | (Westbank) Located in soybean/sugarcane field on Short St. in Killona. | 119°<br>0.84 | N 30.00158<br>W 90.48323 |
| APQ-1 | (Westbank) Located in soybean/sugarcane field off LA 18 east of LA 18/3141 intersection. | 132°<br>0.81 | N 30.00356<br>W 90.48093 |
| APF-1 | (Westbank) Located on north side of Secondary Meteorological Tower. | 299°<br>0.35 | N 29.99302<br>W 90.46601 |
| APC-1 | (Eastbank) Located inside Little Gypsy Cooling Water Intake Structure fence. | 219°<br>0.67 | N 30.00307<br>W 90.46401 |
| APE-30* | (Westbank) Located on roof of Energy office building on Delaronde St. in Algiers. | 276°<br>25.2 | N 29.95289<br>W 90.05430 |

* DENOTES CONTROL LOCATIONS

# RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

SAMPLE LOCATION TABLE (Continued)

| LOCATION NUMBER | LOCATION DESCRIPTION | BEARING/ MILES TO PLANT | Position Latitude Longitude |
|---|---|---|---|
| | **BROAD LEAF** | | |
| BLQ-1 | (Westbank) Located near air sample station APQ-1. | 132°<br>0.83 | N 30.00367<br>W 90.48132 |
| BLB-1 | (Eastbank) Located west of Little Gypsy on LA 628. | 197°<br>0.81 | N 30.00665<br>W 90.46691 |
| BLE-20* | (Westbank) Located on property of Nine Mile Point in Westwego. | 280°<br>19.7 | N 29.94142<br>W 90.14909 |

* DENOTES CONTROL LOCATION(S)

# RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

SAMPLE LOCATION TABLE (Continued)

| LOCATION NUMBER | LOCATION DESCRIPTION | BEARING/ MILES TO PLANT | Position Latitude Longitude |
|---|---|---|---|
| | **INGESTION** | | |
| | **MILK** | | |
| MKE-3 | (Westbank) Located at the Zeringue's house on LA 18 in Taft. | 279°<br>2.35 | N 29.98926<br>W 90.43243 |
| MKA-31* | (Eastbank) Located at 18736 Sisters Road, Ponchatoula, LA. | 3°<br>31.2 | N 30.50439<br>W 90.25114 |
| | **FISH** | | |
| FH-1* | Upstream of the plant intake structure. | N/A | N/A |
| FH-2 | Downstream of the plant discharge structure. | N/A | N/A |
| FH-3 | (Westbank) Waterways downstream of plant discharge directed to 40 Arpent Canal. | N/A | N/A |

* DENOTES CONTROL LOCATIONS

N/A - Not Applicable for this sampling location.

# RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

SAMPLE LOCATION TABLE (Continued)

| LOCATION NUMBER | LOCATION DESCRIPTION | BEARING/ MILES TO PLANT | Position Latitude Longitude |
|---|---|---|---|
| | **WATERBORNE** | | |
| SWK-1 | (Westbank) Located at 40 Arpent Canal south of the plant. | 14°<br>0.49 | N 29.98866<br>W 90.47324 |
| SHWE-3 | (Westbank) Located at Foot Ferry Landing on LA 18. | 276°<br>2.99 | N 29.99063<br>W 90.42151 |
| SHWK-1 | (Westbank) Located at 40 Arpent Canal south of plant. | 14°<br>0.49 | N 29.98866<br>W 90.47324 |
| SHWQ-6* | (Eastbank) Located on LA 628 east of Reserve ferry landing. | 129°<br>5.99 | N 30.05154<br>W 90.54748 |
| DWE-5<br>SWE-5 | (Eastbank) Located at St. Charles Parish Waterworks in New Sarpy. | 277°<br>4.59 | N 29.98622<br>W 90.39525 |
| DWP-7*<br>SWP-7* | (Westbank) Located at St. John Parish Waterworks in Edgard. | 117°<br>7.37 | N 30.04629<br>W 90.57931 |
| DWF-2<br>SWF-2 | (Westbank) Located at Dow Chemical Plant drinking water canal. | 302°<br>1.51 | N 29.98371<br>W 90.44989 |

* DENOTES CONTROL LOCATIONS

# RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

SAMPLE LOCATION TABLE (Continued)

| LOCATION NUMBER | LOCATION DESCRIPTION | BEARING/ MILES TO PLANT | Position Latitude Longitude |
|---|---|---|---|
| | **SANITARY SYSTEM** | | |
| SWR-1** | Sewage lift station Northwest of MSB. | 153°<br>0.10 | N 29.99684<br>W 90.47184 |

** Sampling requirements are not derived directly from REMP requirements therefore results will not appear in the annual report. However, it represents another possible environmental interface with the plant.

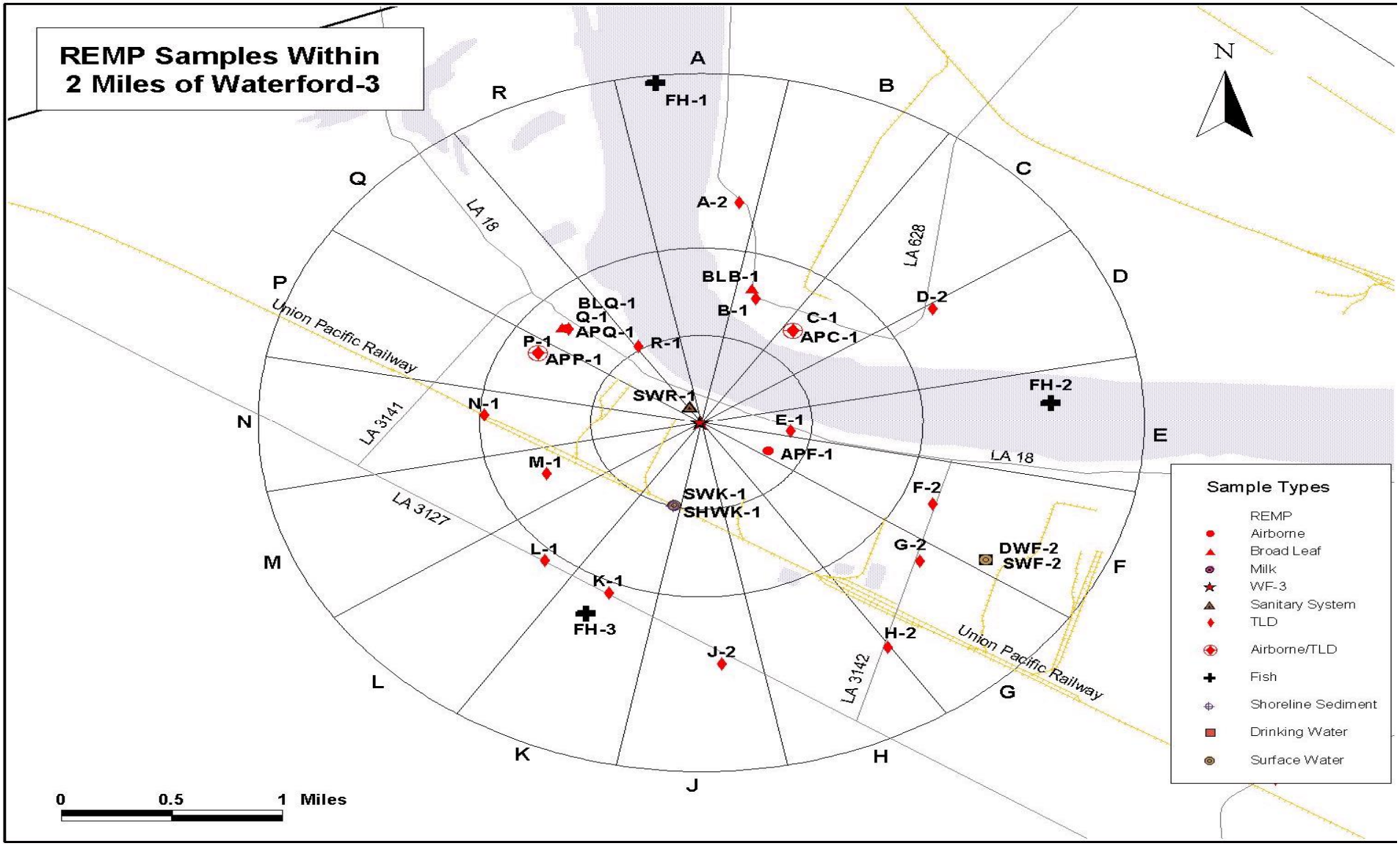
SECTOR AND ZONE DESIGNATORS FOR RADIOLOGICAL SAMPLING AND MONITORING POINTS

| SECTOR NOMENCLATURE | | ZONE NOMENCLATURE | |
|---|---|---|---|
| CENTERLINE OF SECTOR IN DEGREES TRUE NORTH FROM FACILITY | 22 1/2° SECTOR | MILES FROM FACILITY | ZONE |
| 0 & 360 | *A N | 0-1 | 1 |
| 22 1/2 | B NNE | 1-2 | 2 |
| 45 | C NE | 2-3 | 3 |
| 67 1/2 | D ENE | 3-4 | 4 |
| 90 | E E | 4-5 | 5 |
| 112 1/2 | F ESE | 5-6 | 6 |
| 135 | G SE | 6-7 | 7 |
| 157 1/2 | H OR SSE | 7-8 | 8 |
| 180 | J S | 8-9 | 9 |
| 202 1/2 | K SSW | 9-10 | 10 |
| 225 | L SW | 10-15 | 15 |
| 247 1/2 | M WSW | 15-20 | 20 |
| 270 | N W | 20-25 | 25 |
| 292 1/2 | P WNW | 25-30 | 30 |
| 315 | Q NW | 30-35 | 35 |
| 337 1/2 | R NNW | 35-40 | 40 |
| | | 40-45 | 45 |
| | | 45-50 | 50 |

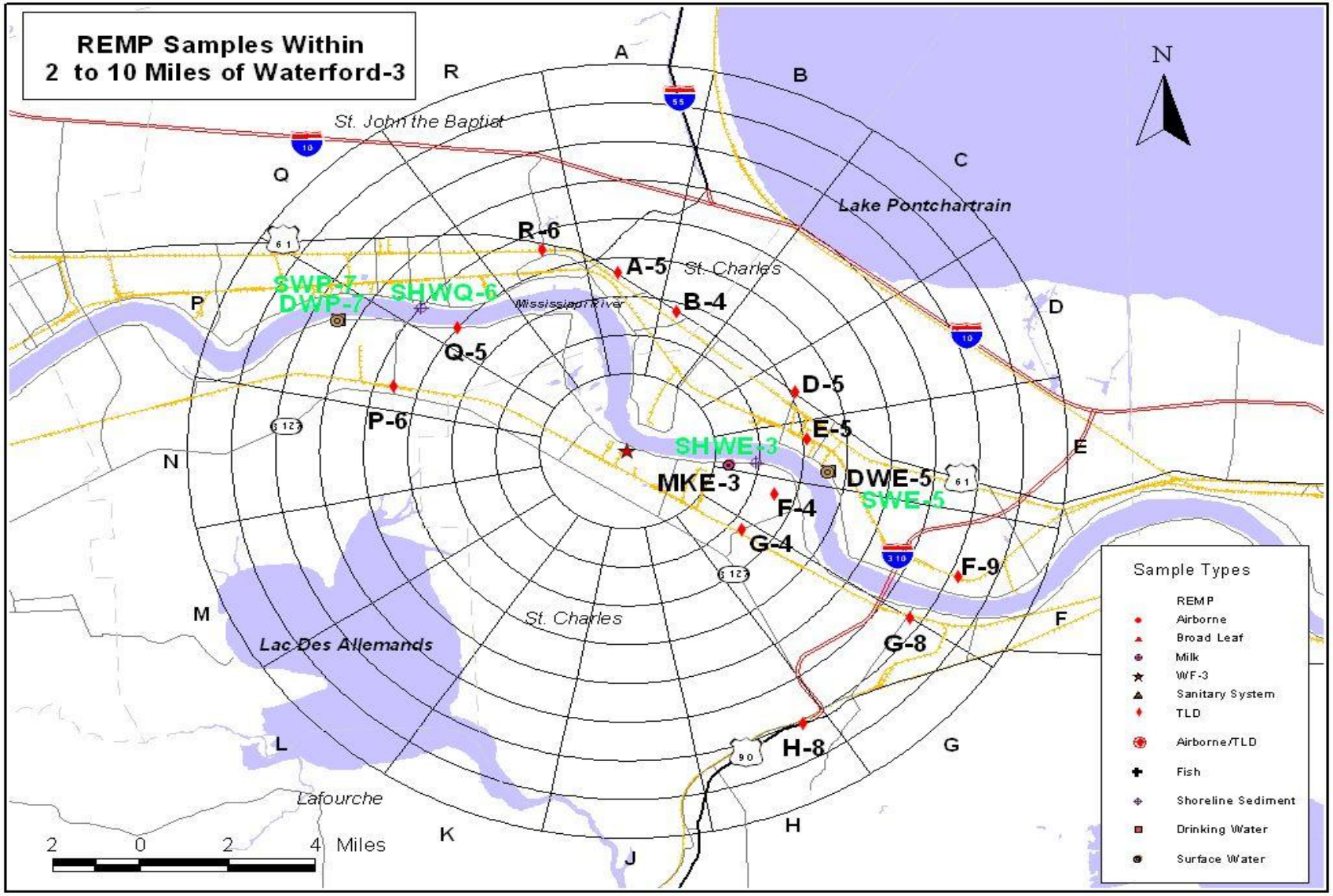
AREA SEGMENT - An area is identified by a Sector and Zone designator. Thus, area N-1 is that area which lies between 348 3/4 and 11¼ degrees true north from the facility out to a radius of 1 mile. Area G-4 would be that area between 123 3/4 to 146¼ degrees and the 3- and 4-mile arcs from the facility. For Airborne, Ingestion (milk), and Food Products pathways, the sector designator will be preceded by acronyms AP, MK, and FP, respectively.

* The letters I and O have been omitted from these sector designators so as to eliminate possible confusion between letters and numbers.

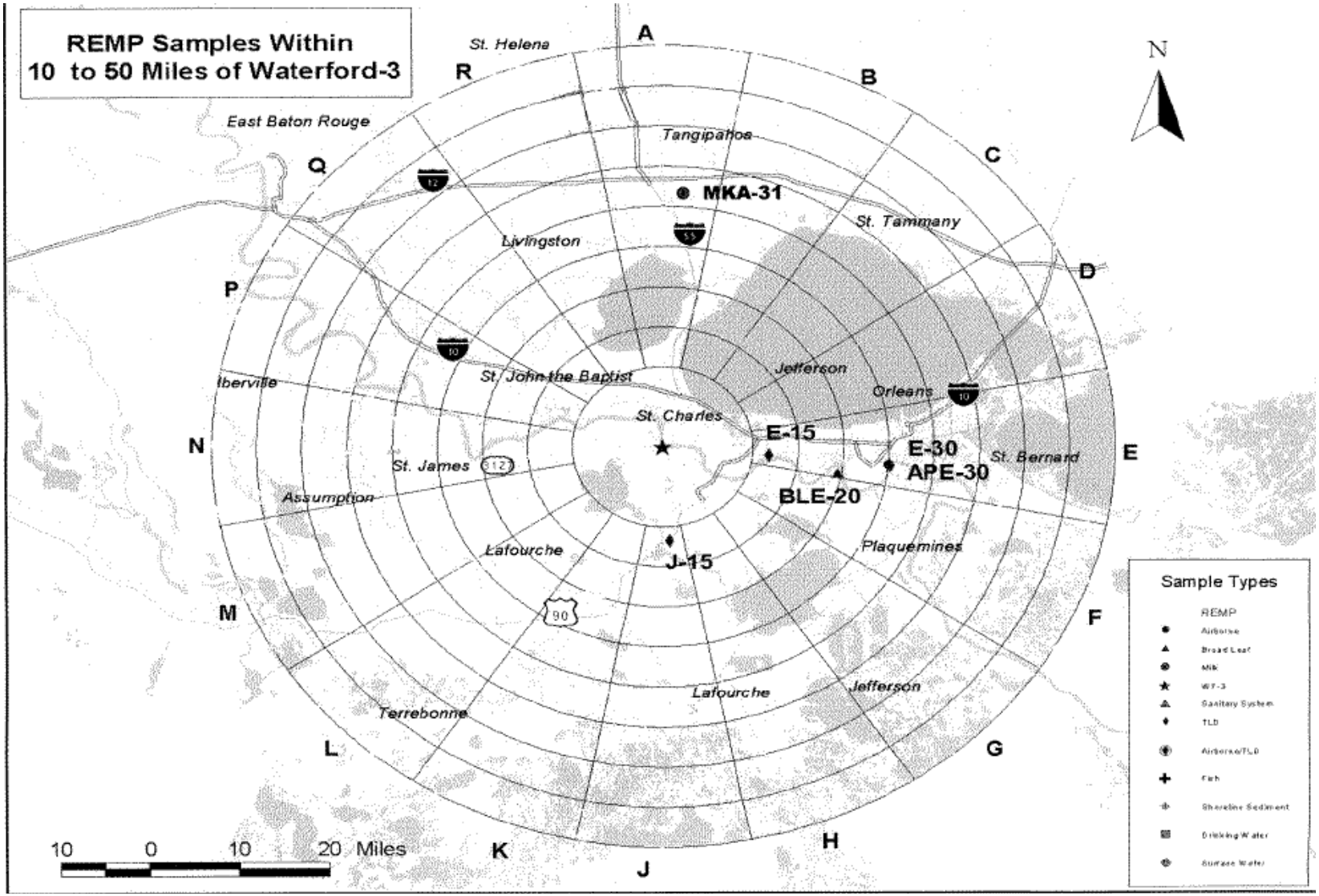
REMP SAMPLING LOCATIONS
WITHIN 2 MILES OF WATERFORD 3



REMP SAMPLES 2 TO 10 MILES
FROM WATERFORD 3



REMP SAMPLES 10 TO 50 MILES
FROM WATERFORD 3



# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Inhalation Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| H-3 | 0.00e+00 | 7.18e+02 | 7.18e+02 | 7.18e+02 | 7.18e+02 | 7.18e+02 | 7.18e+02 |
| Be-10 | 1.58e+06 | 2.45e+05 | 3.97e+04 | 0.00e+00 | 0.00e+00 | 1.78e+06 | 1.34e+05 |
| C-14 | 1.82e+04 | 3.41e+03 | 3.41e+03 | 3.41e+03 | 3.41e+03 | 3.41e+03 | 3.41e+03 |
| N-13 | 5.02e+01 | 5.02e+01 | 5.02e+01 | 5.02e+01 | 5.02e+01 | 5.02e+01 | 5.02e+01 |
| F-18 | 3.77e+03 | 0.00e+00 | 4.15e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.39e+01 |
| Na-22 | 1.04e+05 | 1.04e+05 | 1.04e+05 | 1.04e+05 | 1.04e+05 | 1.04e+05 | 1.04e+05 |
| Na-24 | 1.02e+04 | 1.02e+04 | 1.02e+04 | 1.02e+04 | 1.02e+04 | 1.02e+04 | 1.02e+04 |
| P-32 | 1.32e+06 | 7.71e+04 | 5.01e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 8.64e+04 |
| Ca-41 | 3.06e+05 | 0.00e+00 | 3.30e+04 | 0.00e+00 | 0.00e+00 | 3.06e+04 | 2.29e+03 |
| Sc-46 | 4.41e+05 | 8.56e+05 | 2.49e+05 | 0.00e+00 | 7.99e+05 | 0.00e+00 | 2.58e+05 |
| Cr-51 | 0.00e+00 | 0.00e+00 | 1.00e+02 | 5.95e+01 | 2.28e+01 | 1.44e+04 | 3.32e+03 |
| Mn-54 | 0.00e+00 | 3.96e+04 | 6.30e+03 | 0.00e+00 | 9.84e+03 | 1.40e+06 | 7.74e+04 |
| Mn-56 | 0.00e+00 | 1.24e+00 | 1.83e-01 | 0.00e+00 | 1.30e+00 | 9.44e+03 | 2.02e+04 |
| Fe-55 | 2.46e+04 | 1.70e+04 | 3.94e+03 | 0.00e+00 | 0.00e+00 | 7.21e+04 | 6.03e+03 |
| Fe-59 | 1.18e+04 | 2.78e+04 | 1.06e+04 | 0.00e+00 | 0.00e+00 | 1.02e+06 | 1.88e+05 |
| Co-57 | 0.00e+00 | 6.92e+02 | 6.71e+02 | 0.00e+00 | 0.00e+00 | 3.70e+05 | 3.14e+04 |
| Co-58 | 0.00e+00 | 1.58e+03 | 2.07e+03 | 0.00e+00 | 0.00e+00 | 9.28e+05 | 1.06e+05 |
| Co-60 | 0.00e+00 | 1.15e+04 | 1.48e+04 | 0.00e+00 | 0.00e+00 | 5.97e+06 | 2.85e+05 |
| Ni-59 | 3.25e+04 | 1.17e+04 | 5.42e+03 | 0.00e+00 | 0.00e+00 | 6.56e+04 | 4.89e+03 |
| Ni-63 | 4.32e+05 | 3.14e+04 | 1.45e+04 | 0.00e+00 | 0.00e+00 | 1.78e+05 | 1.34e+04 |
| Ni-65 | 1.54e+00 | 2.10e-01 | 9.12e-02 | 0.00e+00 | 0.00e+00 | 5.60e+03 | 1.23e+04 |
| Cu-64 | 0.00e+00 | 1.46e+00 | 6.15e-01 | 0.00e+00 | 4.62e+00 | 6.78e+03 | 4.90e+04 |
| Zn-65 | 3.24e+04 | 1.03e+05 | 4.66e+04 | 0.00e+00 | 6.90e+04 | 8.64e+05 | 5.34e+04 |
| Zn-69 | 3.38e-02 | 6.51e-02 | 4.52e-03 | 0.00e+00 | 4.22e-02 | 9.20e+02 | 1.63e+01 |
| Zn-69m | 8.16e+00 | 1.96e+01 | 1.79e+00 | 0.00e+00 | 1.18e+01 | 1.90e+04 | 1.37e+05 |
| Se-79 | 0.00e+00 | 3.06e+03 | 4.87e+02 | 0.00e+00 | 4.55e+03 | 3.58e+05 | 2.66e+04 |
| Br-82 | 0.00e+00 | 0.00e+00 | 1.35e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.04e+04 |
| Br-83 | 0.00e+00 | 0.00e+00 | 2.41e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.32e+02 |
| Br-84 | 0.00e+00 | 0.00e+00 | 3.13e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.64e-03 |
| Br-85 | 0.00e+00 | 0.00e+00 | 1.28e+01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Inhalation Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Rb-86 | 0.00e+00 | 1.35e+05 | 5.90e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.66e+04 |
| Rb-87 | 0.00e+00 | 7.89e+04 | 2.57e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.30e+03 |
| Rb-88 | 0.00e+00 | 3.87e+02 | 1.93e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.34e-09 |
| Rb-89 | 0.00e+00 | 2.56e+02 | 1.70e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 9.28e-12 |
| Sr-89 | 3.04e+05 | 0.00e+00 | 8.72e+03 | 0.00e+00 | 0.00e+00 | 1.40e+06 | 3.50e+05 |
| Sr-90 | 2.87e+07 | 0.00e+00 | 5.77e+05 | 0.00e+00 | 0.00e+00 | 9.60e+06 | 7.22e+05 |
| Sr-91 | 6.19e+01 | 0.00e+00 | 2.50e+00 | 0.00e+00 | 0.00e+00 | 3.65e+04 | 1.91e+05 |
| Sr-92 | 6.74e+00 | 0.00e+00 | 2.91e-01 | 0.00e+00 | 0.00e+00 | 1.65e+04 | 4.30e+04 |
| Y-90 | 2.09e+03 | 0.00e+00 | 5.61e+01 | 0.00e+00 | 0.00e+00 | 1.70e+05 | 5.06e+05 |
| Y-91 | 4.62e+05 | 0.00e+00 | 1.24e+04 | 0.00e+00 | 0.00e+00 | 1.70e+06 | 3.85e+05 |
| Y-91m | 2.61e-01 | 0.00e+00 | 1.02e-02 | 0.00e+00 | 0.00e+00 | 1.92e+03 | 1.33e+00 |
| Y-92 | 1.03e+01 | 0.00e+00 | 3.02e-01 | 0.00e+00 | 0.00e+00 | 1.57e+04 | 7.35e+04 |
| Y-93 | 9.44e+01 | 0.00e+00 | 2.61e+00 | 0.00e+00 | 0.00e+00 | 4.85e+04 | 4.22e+05 |
| Zr-93 | 4.18e+05 | 2.34e+04 | 1.10e+04 | 0.00e+00 | 8.88e+04 | 1.70e+05 | 1.21e+04 |
| Zr-95 | 1.07e+05 | 3.44e+04 | 2.33e+04 | 0.00e+00 | 5.42e+04 | 1.77e+06 | 1.50e+05 |
| Zr-97 | 9.68e+01 | 1.96e+01 | 9.04e+00 | 0.00e+00 | 2.97e+01 | 7.87e+04 | 5.23e+05 |
| Nb-93m | 2.48e+05 | 8.08e+04 | 1.99e+04 | 0.00e+00 | 9.28e+04 | 2.49e+05 | 1.90e+04 |
| Nb-95 | 1.41e+04 | 7.82e+03 | 4.21e+03 | 0.00e+00 | 7.74e+03 | 5.05e+05 | 1.04e+05 |
| Nb-97 | 2.22e-01 | 5.62e-02 | 2.05e-02 | 0.00e+00 | 6.54e-02 | 2.40e+03 | 2.42e+02 |
| Mo-93 | 0.00e+00 | 9.36e+03 | 2.54e+02 | 0.00e+00 | 2.84e+03 | 4.09e+05 | 3.03e+04 |
| Mo-99 | 0.00e+00 | 1.21e+02 | 2.30e+01 | 0.00e+00 | 2.91e+02 | 9.12e+04 | 2.48e+05 |
| Tc-101 | 4.18e-05 | 6.02e-05 | 5.90e-04 | 0.00e+00 | 1.08e-03 | 3.99e+02 | 1.09e-11 |
| Tc-99 | 2.50e+02 | 3.71e+02 | 1.00e+02 | 0.00e+00 | 4.68e+03 | 8.08e+05 | 6.03e+04 |
| Tc-99m | 1.03e-03 | 2.91e-03 | 3.70e-02 | 0.00e+00 | 4.42e-02 | 7.64e+02 | 4.16e+03 |
| Ru-103 | 1.53e+03 | 0.00e+00 | 6.58e+02 | 0.00e+00 | 5.83e+03 | 5.05e+05 | 1.10e+05 |
| Ru-105 | 7.90e-01 | 0.00e+00 | 3.11e-01 | 0.00e+00 | 1.02e+00 | 1.10e+04 | 4.82e+04 |
| Ru-106 | 6.91e+04 | 0.00e+00 | 8.72e+03 | 0.00e+00 | 1.34e+05 | 9.36e+06 | 9.12e+05 |
| Rh-105 | 7.39e+00 | 5.38e+00 | 3.54e+00 | 0.00e+00 | 2.29e+01 | 1.93e+04 | 8.72e+04 |
| Pd-107 | 0.00e+00 | 6.62e+02 | 4.70e+01 | 0.00e+00 | 5.26e+03 | 7.58e+04 | 5.65e+03 |
| Pd-109 | 0.00e+00 | 3.70e+00 | 9.28e-01 | 0.00e+00 | 1.88e+01 | 1.48e+04 | 1.22e+05 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Inhalation Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ag-110m | 1.08e+04 | 1.00e+04 | 5.94e+03 | 0.00e+00 | 1.97e+04 | 4.63e+06 | 3.02e+05 |
| Ag-111 | 3.40e+02 | 1.42e+02 | 7.10e+01 | 0.00e+00 | 4.59e+02 | 1.86e+05 | 2.23e+05 |
| Cd-113m | 0.00e+00 | 1.23e+06 | 3.98e+04 | 0.00e+00 | 1.37e+06 | 1.66e+06 | 1.27e+05 |
| Cd-115m | 0.00e+00 | 1.97e+05 | 6.36e+03 | 0.00e+00 | 1.58e+05 | 1.41e+06 | 3.84e+05 |
| Sn-123 | 2.42e+05 | 5.34e+03 | 7.86e+03 | 4.54e+03 | 0.00e+00 | 2.30e+06 | 3.14e+05 |
| Sn-125 | 9.28e+03 | 2.50e+02 | 5.62e+02 | 2.07e+02 | 0.00e+00 | 5.90e+05 | 5.45e+05 |
| Sn-126 | 1.26e+06 | 3.34e+04 | 4.80e+04 | 9.84e+03 | 0.00e+00 | 9.36e+06 | 1.27e+05 |
| Sb-124 | 3.12e+04 | 5.89e+02 | 1.24e+04 | 7.55e+01 | 0.00e+00 | 2.48e+06 | 4.06e+05 |
| Sb-125 | 5.34e+04 | 5.95e+02 | 1.26e+04 | 5.40e+01 | 0.00e+00 | 1.74e+06 | 1.01e+05 |
| Sb-126 | 3.60e+03 | 7.30e+01 | 1.30e+03 | 2.20e+01 | 0.00e+00 | 7.66e+05 | 4.81e+05 |
| Sb-127 | 2.64e+02 | 5.78e+00 | 1.02e+02 | 3.18e+00 | 0.00e+00 | 1.64e+05 | 3.02e+05 |
| Te-125m | 3.42e+03 | 1.58e+03 | 4.67e+02 | 1.05e+03 | 1.24e+04 | 3.14e+05 | 7.06e+04 |
| Te-127 | 1.40e+00 | 6.42e-01 | 3.10e-01 | 1.06e+00 | 5.10e+00 | 6.51e+03 | 5.74e+04 |
| Te-127m | 1.26e+04 | 5.77e+03 | 1.57e+03 | 3.29e+03 | 4.58e+04 | 9.60e+05 | 1.50e+05 |
| Te-129 | 4.98e-02 | 2.39e-02 | 1.24e-02 | 3.90e-02 | 1.87e-01 | 1.94e+03 | 1.57e+02 |
| Te-129m | 9.76e+03 | 4.67e+03 | 1.58e+03 | 3.44e+03 | 3.66e+04 | 1.16e+06 | 3.83e+05 |
| Te-131 | 1.11e-02 | 5.95e-03 | 3.59e-03 | 9.36e-03 | 4.37e-02 | 1.39e+03 | 1.84e+01 |
| Te-131m | 6.99e+01 | 4.36e+01 | 2.90e+01 | 5.50e+01 | 3.09e+02 | 1.46e+05 | 5.56e+05 |
| Te-132 | 2.60e+02 | 2.15e+02 | 1.62e+02 | 1.90e+02 | 1.46e+03 | 2.88e+05 | 5.10e+05 |
| Te-133m | 5.79e-02 | 4.32e-02 | 3.34e-02 | 5.02e-02 | 2.99e-01 | 4.41e+03 | 6.12e+01 |
| Te-134 | 3.07e-02 | 2.58e-02 | 1.26e-02 | 2.75e-02 | 1.74e-01 | 3.47e+03 | 2.38e-01 |
| I-129 | 1.98e+04 | 1.69e+04 | 5.53e+04 | 4.43e+07 | 3.62e+04 | 0.00e+00 | 1.78e+03 |
| I-130 | 4.58e+03 | 1.34e+04 | 5.28e+03 | 1.14e+06 | 2.09e+04 | 0.00e+00 | 7.69e+03 |
| I-131 | 2.52e+04 | 3.58e+04 | 2.05e+04 | 1.19e+07 | 6.13e+04 | 0.00e+00 | 6.28e+03 |
| I-132 | 1.16e+03 | 3.26e+03 | 1.16e+03 | 1.14e+05 | 5.18e+03 | 0.00e+00 | 4.06e+02 |
| I-133 | 8.64e+03 | 1.48e+04 | 4.52e+03 | 2.15e+06 | 2.58e+04 | 0.00e+00 | 8.88e+03 |
| I-134 | 6.44e+02 | 1.73e+03 | 6.15e+02 | 2.98e+04 | 2.75e+03 | 0.00e+00 | 1.01e+00 |
| I-135 | 2.68e+03 | 6.98e+03 | 2.57e+03 | 4.48e+05 | 1.11e+04 | 0.00e+00 | 5.25e+03 |
| Cs-134 | 3.73e+05 | 8.48e+05 | 7.28e+05 | 0.00e+00 | 2.87e+05 | 9.76e+04 | 1.04e+04 |
| Cs-134m | 1.27e+02 | 2.56e+02 | 1.38e+02 | 0.00e+00 | 1.46e+02 | 2.34e+01 | 6.34e+01 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Inhalation Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Cs-135 | 1.17e+05 | 1.03e+05 | 4.79e+04 | 0.00e+00 | 4.09e+04 | 1.26e+04 | 1.69e+03 |
| Cs-136 | 3.90e+04 | 1.46e+05 | 1.10e+05 | 0.00e+00 | 8.56e+04 | 1.20e+04 | 1.17e+04 |
| Cs-137 | 4.78e+05 | 6.21e+05 | 4.28e+05 | 0.00e+00 | 2.22e+05 | 7.52e+04 | 8.40e+03 |
| Cs-138 | 3.31e+02 | 6.21e+02 | 3.24e+02 | 0.00e+00 | 4.80e+02 | 4.86e+01 | 1.86e-03 |
| Cs-139 | 2.05e+02 | 2.90e+02 | 1.11e+02 | 0.00e+00 | 2.44e+02 | 2.27e+01 | 4.39e-21 |
| Ba-139 | 9.36e-01 | 6.66e-04 | 2.74e-02 | 0.00e+00 | 6.22e-04 | 3.76e+03 | 8.96e+02 |
| Ba-140 | 3.90e+04 | 4.90e+01 | 2.57e+03 | 0.00e+00 | 1.67e+01 | 1.27e+06 | 2.18e+05 |
| Ba-141 | 1.00e-01 | 7.53e-05 | 3.36e-03 | 0.00e+00 | 7.00e-05 | 1.94e+03 | 1.16e-07 |
| Ba-142 | 2.63e-02 | 2.70e-05 | 1.66e-03 | 0.00e+00 | 2.29e-05 | 1.19e+03 | 1.57e-16 |
| La-140 | 3.44e+02 | 1.74e+02 | 4.58e+01 | 0.00e+00 | 0.00e+00 | 1.36e+05 | 4.58e+05 |
| La-141 | 4.27e+00 | 1.33e+00 | 2.17e-01 | 0.00e+00 | 0.00e+00 | 1.08e+04 | 5.85e+04 |
| La-142 | 6.83e-01 | 3.10e-01 | 7.72e-02 | 0.00e+00 | 0.00e+00 | 6.33e+03 | 2.11e+03 |
| Ce-141 | 1.99e+04 | 1.35e+04 | 1.53e+03 | 0.00e+00 | 6.26e+03 | 3.62e+05 | 1.20e+05 |
| Ce-143 | 1.86e+02 | 1.38e+02 | 1.53e+01 | 0.00e+00 | 6.08e+01 | 7.98e+04 | 2.26e+05 |
| Ce-144 | 3.43e+06 | 1.43e+06 | 1.84e+05 | 0.00e+00 | 8.48e+05 | 7.78e+06 | 8.16e+05 |
| Pr-143 | 9.36e+03 | 3.75e+03 | 4.64e+02 | 0.00e+00 | 2.16e+03 | 2.81e+05 | 2.00e+05 |
| Pr-144 | 3.01e-02 | 1.25e-02 | 1.53e-03 | 0.00e+00 | 7.05e-03 | 1.02e+03 | 2.15e-08 |
| Nd-147 | 5.27e+03 | 6.10e+03 | 3.65e+02 | 0.00e+00 | 3.56e+03 | 2.21e+05 | 1.73e+05 |
| Pm-147 | 6.70e+05 | 6.30e+04 | 2.55e+04 | 0.00e+00 | 1.19e+05 | 5.28e+05 | 4.43e+04 |
| Pm-148 | 3.07e+03 | 5.10e+02 | 2.56e+02 | 0.00e+00 | 9.60e+02 | 3.13e+05 | 4.64e+05 |
| Pm-148m | 7.86e+04 | 2.03e+04 | 1.55e+04 | 0.00e+00 | 3.08e+04 | 1.71e+06 | 3.34e+05 |
| Pm-149 | 2.75e+02 | 3.90e+01 | 1.59e+01 | 0.00e+00 | 7.35e+01 | 5.77e+04 | 2.00e+05 |
| Pm-151 | 6.80e+01 | 1.14e+01 | 5.77e+00 | 0.00e+00 | 2.04e+01 | 3.15e+04 | 1.60e+05 |
| Sm-151 | 6.87e+05 | 1.18e+05 | 2.84e+04 | 0.00e+00 | 1.33e+05 | 3.56e+05 | 2.60e+04 |
| Sm-153 | 1.36e+02 | 1.14e+02 | 8.32e+00 | 0.00e+00 | 3.67e+01 | 3.31e+04 | 1.26e+05 |
| Eu-152 | 1.90e+06 | 4.33e+05 | 3.81e+05 | 0.00e+00 | 2.68e+06 | 2.74e+06 | 1.27e+05 |
| Eu-154 | 5.92e+06 | 7.28e+05 | 5.18e+05 | 0.00e+00 | 3.49e+06 | 4.67e+06 | 2.72e+05 |
| Eu-155 | 8.08e+05 | 1.14e+05 | 7.37e+04 | 0.00e+00 | 5.27e+05 | 7.57e+05 | 4.76e+04 |
| Eu-156 | 1.54e+04 | 1.18e+04 | 1.92e+03 | 0.00e+00 | 7.96e+03 | 6.85e+05 | 3.60e+05 |
| Tb-160 | 1.77e+05 | 0.00e+00 | 2.20e+04 | 0.00e+00 | 7.28e+04 | 1.54e+06 | 2.14e+05 |

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# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Inhalation Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ho-166m | 2.70e+06 | 8.40e+05 | 6.40e+05 | 0.00e+00 | 1.26e+06 | 3.15e+06 | 1.27e+05 |
| W-181 | 4.98e+01 | 1.62e+01 | 1.74e+00 | 0.00e+00 | 0.00e+00 | 1.37e+04 | 2.02e+03 |
| W-185 | 1.56e+03 | 5.18e+02 | 5.45e+01 | 0.00e+00 | 0.00e+00 | 4.46e+05 | 8.56e+04 |
| W-187 | 8.48e+00 | 7.08e+00 | 2.48e+00 | 0.00e+00 | 0.00e+00 | 2.90e+04 | 1.55e+05 |
| Pb-210 | 2.11e+08 | 5.38e+07 | 6.70e+06 | 0.00e+00 | 1.70e+08 | 2.10e+08 | 1.21e+04 |
| Bi-210 | 1.85e+03 | 1.27e+04 | 1.06e+03 | 0.00e+00 | 1.54e+05 | 8.88e+06 | 2.36e+05 |
| Po-210 | 3.18e+06 | 6.88e+06 | 7.66e+05 | 0.00e+00 | 2.36e+07 | 2.51e+08 | 3.35e+05 |
| Ra-223 | 1.44e+06 | 2.22e+03 | 2.88e+05 | 0.00e+00 | 6.28e+04 | 2.04e+08 | 2.27e+06 |
| Ra-224 | 1.58e+05 | 3.82e+02 | 3.17e+04 | 0.00e+00 | 1.08e+04 | 7.02e+07 | 2.41e+06 |
| Ra-225 | 2.40e+06 | 2.85e+03 | 4.79e+05 | 0.00e+00 | 8.08e+04 | 2.34e+08 | 2.17e+06 |
| Ra-226 | 1.00e+09 | 1.91e+04 | 7.31e+08 | 0.00e+00 | 5.42e+05 | 9.36e+08 | 2.35e+06 |
| Ra-228 | 3.53e+08 | 9.84e+03 | 3.82e+08 | 0.00e+00 | 2.78e+05 | 1.29e+09 | 4.00e+05 |
| Ac-225 | 3.38e+06 | 4.66e+06 | 2.27e+05 | 0.00e+00 | 5.30e+05 | 1.77e+08 | 2.02e+06 |
| Ac-227 | 1.84e+10 | 2.44e+09 | 1.09e+09 | 0.00e+00 | 7.86e+08 | 1.93e+09 | 4.06e+05 |
| Th-227 | 1.74e+06 | 3.14e+04 | 5.00e+04 | 0.00e+00 | 1.78e+05 | 3.02e+08 | 2.67e+06 |
| Th-228 | 1.60e+09 | 2.71e+07 | 5.42e+07 | 0.00e+00 | 1.51e+08 | 8.08e+09 | 2.79e+06 |
| Th-229 | 1.21e+11 | 3.47e+09 | 2.01e+09 | 0.00e+00 | 1.70e+10 | 2.90e+10 | 3.86e+05 |
| Th-230 | 1.83e+10 | 1.05e+09 | 5.09e+08 | 0.00e+00 | 5.12e+09 | 4.97e+09 | 2.98e+05 |
| Th-232 | 2.05e+10 | 8.96e+08 | 7.23e+06 | 0.00e+00 | 4.38e+09 | 4.77e+09 | 2.54e+05 |
| Th-234 | 1.30e+04 | 7.65e+02 | 3.76e+02 | 0.00e+00 | 4.33e+03 | 1.51e+06 | 5.62e+05 |
| Pa-231 | 4.06e+10 | 1.53e+09 | 1.58e+09 | 0.00e+00 | 8.56e+09 | 4.60e+08 | 3.55e+05 |
| Pa-233 | 9.68e+03 | 1.94e+03 | 1.67e+03 | 0.00e+00 | 7.32e+03 | 2.82e+05 | 8.16e+04 |
| U-232 | 4.11e+08 | 0.00e+00 | 2.93e+07 | 0.00e+00 | 4.45e+07 | 1.78e+09 | 3.37e+05 |
| U-233 | 8.72e+07 | 0.00e+00 | 5.28e+06 | 0.00e+00 | 2.03e+07 | 4.26e+08 | 3.11e+05 |
| U-234 | 8.32e+07 | 0.00e+00 | 5.17e+06 | 0.00e+00 | 1.99e+07 | 4.18e+08 | 3.05e+05 |
| U-235 | 8.00e+07 | 0.00e+00 | 4.86e+06 | 0.00e+00 | 1.87e+07 | 3.92e+08 | 3.87e+05 |
| U-236 | 8.00e+07 | 0.00e+00 | 4.96e+06 | 0.00e+00 | 1.91e+07 | 4.00e+08 | 2.86e+05 |
| U-237 | 2.94e+02 | 0.00e+00 | 7.82e+01 | 0.00e+00 | 1.21e+03 | 8.16e+04 | 9.60e+04 |
| U-238 | 7.66e+07 | 0.00e+00 | 4.54e+06 | 0.00e+00 | 1.74e+07 | 3.66e+08 | 2.73e+05 |
| Np-237 | 1.25e+10 | 8.00e+09 | 5.50e+08 | 0.00e+00 | 4.08e+09 | 4.18e+08 | 3.94e+05 |

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# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Inhalation Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Np-238 | 2.37e+03 | 5.76e+02 | 3.69e+01 | 0.00e+00 | 2.18e+02 | 8.16e+04 | 1.70e+05 |
| Np-239 | 2.30e+02 | 2.03e+02 | 1.24e+01 | 0.00e+00 | 7.00e+01 | 3.76e+04 | 1.19e+05 |
| Pu-238 | 1.14e+10 | 7.77e+09 | 5.52e+08 | 0.00e+00 | 2.37e+09 | 1.46e+09 | 3.62e+05 |
| Pu-239 | 1.33e+10 | 8.56e+09 | 6.20e+08 | 0.00e+00 | 2.64e+09 | 1.38e+09 | 3.30e+05 |
| Pu-240 | 1.32e+10 | 8.56e+09 | 6.18e+08 | 0.00e+00 | 2.63e+09 | 1.38e+09 | 3.37e+05 |
| Pu-241 | 2.74e+08 | 6.95e+07 | 1.03e+07 | 0.00e+00 | 4.74e+07 | 1.22e+06 | 6.92e+03 |
| Pu-242 | 1.22e+10 | 8.24e+09 | 5.97e+08 | 0.00e+00 | 2.54e+09 | 1.32e+09 | 3.24e+05 |
| Pu-244 | 1.43e+10 | 9.44e+09 | 6.83e+08 | 0.00e+00 | 2.91e+09 | 1.51e+09 | 4.82e+05 |
| Am-241 | 1.34e+10 | 9.04e+09 | 5.37e+08 | 0.00e+00 | 4.03e+09 | 4.85e+08 | 3.68e+05 |
| Am-242m | 1.36e+10 | 8.48e+09 | 5.38e+08 | 0.00e+00 | 4.01e+09 | 1.95e+08 | 4.63e+05 |
| Am-243 | 1.34e+10 | 8.80e+09 | 5.26e+08 | 0.00e+00 | 3.96e+09 | 4.60e+08 | 4.32e+05 |
| Cm-242 | 1.78e+08 | 1.42e+08 | 7.87e+06 | 0.00e+00 | 3.58e+07 | 3.14e+08 | 3.93e+05 |
| Cm-243 | 8.80e+09 | 6.09e+09 | 3.69e+08 | 0.00e+00 | 1.72e+09 | 5.05e+08 | 3.87e+05 |
| Cm-244 | 6.70e+09 | 4.70e+09 | 2.81e+08 | 0.00e+00 | 1.31e+09 | 4.85e+08 | 3.74e+05 |
| Cm-245 | 1.39e+10 | 9.12e+09 | 5.71e+08 | 0.00e+00 | 2.66e+09 | 4.68e+08 | 3.49e+05 |
| Cm-246 | 1.38e+10 | 9.12e+09 | 5.70e+08 | 0.00e+00 | 2.66e+09 | 4.77e+08 | 3.43e+05 |
| Cm-247 | 1.34e+10 | 8.96e+09 | 5.62e+08 | 0.00e+00 | 2.62e+09 | 4.68e+08 | 4.50e+05 |
| Cm-248 | 1.12e+11 | 7.41e+10 | 4.63e+09 | 0.00e+00 | 2.16e+10 | 3.86e+09 | 7.27e+06 |
| Cf-252 | 4.34e+09 | 0.00e+00 | 1.86e+08 | 0.00e+00 | 0.00e+00 | 1.59e+09 | 1.42e+06 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Inhalation Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| H-3 | 0.00e+00 | 7.25e+02 | 7.25e+02 | 7.25e+02 | 7.25e+02 | 7.25e+02 | 7.25e+02 |
| Be-10 | 2.22e+06 | 3.46e+05 | 5.67e+04 | 0.00e+00 | 0.00e+00 | 3.07e+06 | 1.42e+05 |
| C-14 | 2.60e+04 | 4.87e+03 | 4.87e+03 | 4.87e+03 | 4.87e+03 | 4.87e+03 | 4.87e+03 |
| N-13 | 6.92e+01 | 6.92e+01 | 6.92e+01 | 6.92e+01 | 6.92e+01 | 6.92e+01 | 6.92e+01 |
| F-18 | 5.22e+03 | 0.00e+00 | 5.68e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.11e+02 |
| Na-22 | 1.41e+05 | 1.41e+05 | 1.41e+05 | 1.41e+05 | 1.41e+05 | 1.41e+05 | 1.41e+05 |
| Na-24 | 1.38e+04 | 1.38e+04 | 1.38e+04 | 1.38e+04 | 1.38e+04 | 1.38e+04 | 1.38e+04 |
| P-32 | 1.89e+06 | 1.10e+05 | 7.16e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 9.28e+04 |
| Ca-41 | 3.24e+05 | 0.00e+00 | 3.50e+04 | 0.00e+00 | 0.00e+00 | 8.08e+08 | 2.42e+03 |
| Sc-46 | 5.79e+05 | 1.13e+06 | 3.34e+05 | 0.00e+00 | 1.08e+06 | 0.00e+00 | 2.38e+05 |
| Cr-51 | 0.00e+00 | 0.00e+00 | 1.35e+02 | 7.50e+01 | 3.07e+01 | 2.10e+04 | 3.00e+03 |
| Mn-54 | 0.00e+00 | 5.11e+04 | 8.40e+03 | 0.00e+00 | 1.27e+04 | 1.98e+06 | 6.68e+04 |
| Mn-56 | 0.00e+00 | 1.70e+00 | 2.52e-01 | 0.00e+00 | 1.79e+00 | 1.52e+04 | 5.74e+04 |
| Fe-55 | 3.34e+04 | 2.38e+04 | 5.54e+03 | 0.00e+00 | 0.00e+00 | 1.24e+05 | 6.39e+03 |
| Fe-59 | 1.59e+04 | 3.70e+04 | 1.43e+04 | 0.00e+00 | 0.00e+00 | 1.53e+06 | 1.78e+05 |
| Co-57 | 0.00e+00 | 9.44e+02 | 9.20e+02 | 0.00e+00 | 0.00e+00 | 5.86e+05 | 3.14e+04 |
| Co-58 | 0.00e+00 | 2.07e+03 | 2.78e+03 | 0.00e+00 | 0.00e+00 | 1.34e+06 | 9.52e+04 |
| Co-60 | 0.00e+00 | 1.51e+04 | 1.98e+04 | 0.00e+00 | 0.00e+00 | 8.72e+06 | 2.59e+05 |
| Ni-59 | 4.35e+04 | 1.62e+04 | 7.39e+03 | 0.00e+00 | 0.00e+00 | 1.13e+05 | 5.18e+03 |
| Ni-63 | 5.80e+05 | 4.34e+04 | 1.98e+04 | 0.00e+00 | 0.00e+00 | 3.07e+05 | 1.42e+04 |
| Ni-65 | 2.18e+00 | 2.93e-01 | 1.27e-01 | 0.00e+00 | 0.00e+00 | 9.36e+03 | 3.67e+04 |
| Cu-64 | 0.00e+00 | 2.03e+00 | 8.48e-01 | 0.00e+00 | 6.41e+00 | 1.11e+04 | 6.14e+04 |
| Zn-65 | 3.86e+04 | 1.34e+05 | 6.24e+04 | 0.00e+00 | 8.64e+04 | 1.24e+06 | 4.66e+04 |
| Zn-69 | 4.83e-02 | 9.20e-02 | 6.46e-03 | 0.00e+00 | 6.02e-02 | 1.58e+03 | 2.85e+02 |
| Zn-69m | 1.15e+01 | 2.71e+01 | 2.49e+00 | 0.00e+00 | 1.65e+01 | 3.14e+04 | 1.71e+05 |
| Se-79 | 0.00e+00 | 4.34e+03 | 6.97e+02 | 0.00e+00 | 6.50e+03 | 6.17e+05 | 2.82e+04 |
| Br-82 | 0.00e+00 | 0.00e+00 | 1.82e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-83 | 0.00e+00 | 0.00e+00 | 3.44e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-84 | 0.00e+00 | 0.00e+00 | 4.33e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-85 | 0.00e+00 | 0.00e+00 | 1.83e+01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Inhalation Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Rb-86 | 0.00e+00 | 1.90e+05 | 8.40e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.77e+04 |
| Rb-87 | 0.00e+00 | 1.12e+05 | 3.66e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.44e+03 |
| Rb-88 | 0.00e+00 | 5.46e+02 | 2.72e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.92e-05 |
| Rb-89 | 0.00e+00 | 3.52e+02 | 2.33e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.38e-07 |
| Sr-89 | 4.34e+05 | 0.00e+00 | 1.25e+04 | 0.00e+00 | 0.00e+00 | 2.42e+06 | 3.71e+05 |
| Sr-90 | 3.31e+07 | 0.00e+00 | 6.66e+05 | 0.00e+00 | 0.00e+00 | 1.65e+07 | 7.65e+05 |
| Sr-91 | 8.80e+01 | 0.00e+00 | 3.51e+00 | 0.00e+00 | 0.00e+00 | 6.07e+04 | 2.59e+05 |
| Sr-92 | 9.52e+00 | 0.00e+00 | 4.06e-01 | 0.00e+00 | 0.00e+00 | 2.74e+04 | 1.19e+05 |
| Y-90 | 2.98e+03 | 0.00e+00 | 8.00e+01 | 0.00e+00 | 0.00e+00 | 2.93e+05 | 5.59e+05 |
| Y-91 | 6.61e+05 | 0.00e+00 | 1.77e+04 | 0.00e+00 | 0.00e+00 | 2.94e+06 | 4.09e+05 |
| Y-91m | 3.70e-01 | 0.00e+00 | 1.42e-02 | 0.00e+00 | 0.00e+00 | 3.20e+03 | 3.02e+01 |
| Y-92 | 1.47e+01 | 0.00e+00 | 4.29e-01 | 0.00e+00 | 0.00e+00 | 2.68e+04 | 1.65e+05 |
| Y-93 | 1.35e+02 | 0.00e+00 | 3.72e+00 | 0.00e+00 | 0.00e+00 | 8.32e+04 | 5.79e+05 |
| Zr-93 | 5.46e+05 | 2.70e+04 | 1.47e+04 | 0.00e+00 | 9.28e+04 | 2.94e+05 | 1.28e+04 |
| Zr-95 | 1.46e+05 | 4.58e+04 | 3.15e+04 | 0.00e+00 | 6.74e+04 | 2.69e+06 | 1.49e+05 |
| Zr-97 | 1.38e+02 | 2.72e+01 | 1.26e+01 | 0.00e+00 | 4.12e+01 | 1.30e+05 | 6.30e+05 |
| Nb-93m | 3.31e+05 | 1.09e+05 | 2.73e+04 | 0.00e+00 | 1.27e+05 | 4.29e+05 | 2.02e+04 |
| Nb-95 | 1.86e+04 | 1.03e+04 | 5.66e+03 | 0.00e+00 | 1.00e+04 | 7.51e+05 | 9.68e+04 |
| Nb-97 | 3.14e-01 | 7.78e-02 | 2.84e-02 | 0.00e+00 | 9.12e-02 | 3.93e+03 | 2.17e+03 |
| Mo-93 | 0.00e+00 | 1.33e+04 | 3.62e+02 | 0.00e+00 | 4.05e+03 | 7.05e+05 | 3.19e+04 |
| Mo-99 | 0.00e+00 | 1.69e+02 | 3.22e+01 | 0.00e+00 | 4.11e+02 | 1.54e+05 | 2.69e+05 |
| Tc-101 | 5.92e-05 | 8.40e-05 | 8.24e-04 | 0.00e+00 | 1.52e-03 | 6.67e+02 | 8.72e-07 |
| Tc-99 | 3.58e+02 | 5.26e+02 | 1.43e+02 | 0.00e+00 | 6.68e+03 | 1.39e+06 | 6.39e+04 |
| Tc-99m | 1.38e-03 | 3.86e-03 | 4.99e-02 | 0.00e+00 | 5.76e-02 | 1.15e+03 | 6.13e+03 |
| Ru-103 | 2.10e+03 | 0.00e+00 | 8.96e+02 | 0.00e+00 | 7.43e+03 | 7.83e+05 | 1.09e+05 |
| Ru-105 | 1.12e+00 | 0.00e+00 | 4.34e-01 | 0.00e+00 | 1.41e+00 | 1.82e+04 | 9.04e+04 |
| Ru-106 | 9.84e+04 | 0.00e+00 | 1.24e+04 | 0.00e+00 | 1.90e+05 | 1.61e+07 | 9.60e+05 |
| Rh-105 | 1.06e+01 | 7.58e+00 | 4.99e+00 | 0.00e+00 | 3.23e+01 | 3.27e+04 | 9.84e+04 |
| Pd-107 | 0.00e+00 | 9.36e+02 | 6.71e+01 | 0.00e+00 | 7.51e+03 | 1.30e+05 | 5.99e+03 |
| Pd-109 | 0.00e+00 | 5.25e+00 | 1.33e+00 | 0.00e+00 | 2.69e+01 | 2.55e+04 | 1.57e+05 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Inhalation Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ag-110m | 1.38e+04 | 1.31e+04 | 7.99e+03 | 0.00e+00 | 2.50e+04 | 6.75e+06 | 2.73e+05 |
| Ag-111 | 4.86e+02 | 2.02e+02 | 1.01e+02 | 0.00e+00 | 6.54e+02 | 3.20e+05 | 2.40e+05 |
| Cd-113m | 0.00e+00 | 1.74e+06 | 5.68e+04 | 0.00e+00 | 1.94e+06 | 2.87e+06 | 1.34e+05 |
| Cd-115m | 0.00e+00 | 2.78e+05 | 9.12e+03 | 0.00e+00 | 2.26e+05 | 2.42e+06 | 4.08e+05 |
| Sn-123 | 3.45e+05 | 7.55e+03 | 1.12e+04 | 6.04e+03 | 0.00e+00 | 3.97e+06 | 3.33e+05 |
| Sn-125 | 1.33e+04 | 3.54e+02 | 7.99e+02 | 2.76e+02 | 0.00e+00 | 1.01e+06 | 5.83e+05 |
| Sn-126 | 1.74e+06 | 4.31e+04 | 6.59e+04 | 1.14e+04 | 0.00e+00 | 1.38e+07 | 1.34e+05 |
| Sb-124 | 4.30e+04 | 7.94e+02 | 1.68e+04 | 9.76e+01 | 0.00e+00 | 3.85e+06 | 3.98e+05 |
| Sb-125 | 7.38e+04 | 8.08e+02 | 1.72e+04 | 7.04e+01 | 0.00e+00 | 2.74e+06 | 9.92e+04 |
| Sb-126 | 4.95e+03 | 1.02e+02 | 1.78e+03 | 2.80e+01 | 0.00e+00 | 1.24e+06 | 4.81e+05 |
| Sb-127 | 3.71e+02 | 7.94e+00 | 1.40e+02 | 4.17e+00 | 0.00e+00 | 2.65e+05 | 3.15e+05 |
| Te-125m | 4.88e+03 | 2.24e+03 | 6.67e+02 | 1.40e+03 | 0.00e+00 | 5.36e+05 | 7.50e+04 |
| Te-127 | 2.01e+00 | 9.12e-01 | 4.42e-01 | 1.42e+00 | 7.28e+00 | 1.12e+04 | 8.08e+04 |
| Te-127m | 1.80e+04 | 8.16e+03 | 2.18e+03 | 4.38e+03 | 6.54e+04 | 1.66e+06 | 1.59e+05 |
| Te-129 | 7.10e-02 | 3.38e-02 | 1.76e-02 | 5.18e-02 | 2.66e-01 | 3.30e+03 | 1.62e+03 |
| Te-129m | 1.39e+04 | 6.58e+03 | 2.25e+03 | 4.58e+03 | 5.19e+04 | 1.98e+06 | 4.05e+05 |
| Te-131 | 1.58e-02 | 8.32e-03 | 5.04e-03 | 1.24e-02 | 6.18e-02 | 2.34e+03 | 1.51e+01 |
| Te-131m | 9.84e+01 | 6.01e+01 | 4.02e+01 | 7.25e+01 | 4.39e+02 | 2.38e+05 | 6.21e+05 |
| Te-132 | 3.60e+02 | 2.90e+02 | 2.19e+02 | 2.46e+02 | 1.95e+03 | 4.49e+05 | 4.63e+05 |
| Te-133m | 8.08e-02 | 5.86e-02 | 4.57e-02 | 6.54e-02 | 4.06e-01 | 6.97e+03 | 9.84e+02 |
| Te-134 | 4.25e-02 | 3.48e-02 | 2.91e-02 | 3.57e-02 | 2.33e-01 | 5.40e+03 | 1.10e+01 |
| I-129 | 2.82e+04 | 2.35e+04 | 3.92e+04 | 2.93e+07 | 4.21e+04 | 0.00e+00 | 1.83e+03 |
| I-130 | 6.24e+03 | 1.79e+04 | 7.17e+03 | 1.49e+06 | 2.75e+04 | 0.00e+00 | 9.12e+03 |
| I-131 | 3.54e+04 | 4.91e+04 | 2.64e+04 | 1.46e+07 | 8.40e+04 | 0.00e+00 | 6.49e+03 |
| I-132 | 1.59e+03 | 4.38e+03 | 1.58e+03 | 1.51e+05 | 6.92e+03 | 0.00e+00 | 1.27e+03 |
| I-133 | 1.22e+04 | 2.05e+04 | 6.22e+03 | 2.92e+06 | 3.59e+04 | 0.00e+00 | 1.03e+04 |
| I-134 | 8.88e+02 | 2.32e+03 | 8.40e+02 | 3.95e+04 | 3.66e+03 | 0.00e+00 | 2.04e+01 |
| I-135 | 3.70e+03 | 9.44e+03 | 3.49e+03 | 6.21e+05 | 1.49e+04 | 0.00e+00 | 6.95e+03 |
| Cs-134 | 5.02e+05 | 1.13e+06 | 5.49e+05 | 0.00e+00 | 3.75e+05 | 1.46e+05 | 9.76e+03 |
| Cs-134m | 1.76e+02 | 3.48e+02 | 1.88e+02 | 0.00e+00 | 2.03e+02 | 3.65e+01 | 1.62e+02 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Inhalation Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Cs-135 | 1.66e+05 | 1.46e+05 | 3.58e+04 | 0.00e+00 | 5.84e+04 | 2.16e+04 | 1.78e+03 |
| Cs-136 | 5.15e+04 | 1.94e+05 | 1.37e+05 | 0.00e+00 | 1.10e+05 | 1.78e+04 | 1.09e+04 |
| Cs-137 | 6.70e+05 | 8.48e+05 | 3.11e+05 | 0.00e+00 | 3.04e+05 | 1.21e+05 | 8.48e+03 |
| Cs-138 | 4.66e+02 | 8.56e+02 | 4.46e+02 | 0.00e+00 | 6.62e+02 | 7.87e+01 | 2.70e-01 |
| Cs-139 | 2.92e+02 | 4.10e+02 | 1.58e+02 | 0.00e+00 | 3.47e+02 | 3.89e+01 | 1.33e-13 |
| Ba-139 | 1.34e+00 | 9.44e-04 | 3.90e-02 | 0.00e+00 | 8.88e-04 | 6.46e+03 | 6.45e+03 |
| Ba-140 | 5.47e+04 | 6.70e+01 | 3.52e+03 | 0.00e+00 | 2.28e+01 | 2.03e+06 | 2.29e+05 |
| Ba-141 | 1.42e-01 | 1.06e-04 | 4.74e-03 | 0.00e+00 | 9.84e-05 | 3.29e+03 | 7.46e-04 |
| Ba-142 | 3.70e-02 | 3.70e-05 | 2.27e-03 | 0.00e+00 | 3.14e-05 | 1.91e+03 | 4.79e-10 |
| La-140 | 4.79e+02 | 2.36e+02 | 6.26e+01 | 0.00e+00 | 0.00e+00 | 2.14e+05 | 4.87e+05 |
| La-141 | 6.10e+00 | 1.88e+00 | 3.10e-01 | 0.00e+00 | 0.00e+00 | 1.85e+04 | 1.23e+05 |
| La-142 | 9.60e-01 | 4.25e-01 | 1.06e-01 | 0.00e+00 | 0.00e+00 | 1.02e+04 | 1.20e+04 |
| Ce-141 | 2.84e+04 | 1.90e+04 | 2.17e+03 | 0.00e+00 | 8.88e+03 | 6.14e+05 | 1.26e+05 |
| Ce-143 | 2.66e+02 | 1.94e+02 | 2.16e+01 | 0.00e+00 | 8.64e+01 | 1.30e+05 | 2.55e+05 |
| Ce-144 | 4.89e+06 | 2.02e+06 | 2.62e+05 | 0.00e+00 | 1.21e+06 | 1.34e+07 | 8.64e+05 |
| Pr-143 | 1.34e+04 | 5.31e+03 | 6.62e+02 | 0.00e+00 | 3.09e+03 | 4.83e+05 | 2.14e+05 |
| Pr-144 | 4.30e-02 | 1.76e-02 | 2.18e-03 | 0.00e+00 | 1.01e-02 | 1.75e+03 | 2.35e-04 |
| Nd-147 | 7.86e+03 | 8.56e+03 | 5.13e+02 | 0.00e+00 | 5.02e+03 | 3.72e+05 | 1.82e+05 |
| Pm-147 | 9.20e+05 | 8.80e+04 | 3.60e+04 | 0.00e+00 | 1.68e+05 | 9.12e+05 | 4.70e+04 |
| Pm-148 | 4.35e+03 | 7.10e+02 | 3.58e+02 | 0.00e+00 | 1.28e+03 | 5.22e+05 | 4.91e+05 |
| Pm-148m | 1.06e+05 | 2.68e+04 | 2.10e+04 | 0.00e+00 | 4.06e+04 | 2.56e+06 | 3.28e+05 |
| Pm-149 | 3.93e+02 | 5.51e+01 | 2.27e+01 | 0.00e+00 | 1.05e+02 | 9.92e+04 | 2.23e+05 |
| Pm-151 | 9.60e+01 | 1.59e+01 | 8.08e+00 | 0.00e+00 | 2.86e+01 | 5.25e+04 | 1.82e+05 |
| Sm-151 | 8.56e+05 | 1.68e+05 | 3.89e+04 | 0.00e+00 | 1.82e+05 | 6.14e+05 | 2.82e+04 |
| Sm-153 | 1.94e+02 | 1.61e+02 | 1.18e+01 | 0.00e+00 | 5.25e+01 | 5.69e+04 | 1.42e+05 |
| Eu-152 | 2.37e+06 | 5.75e+05 | 5.04e+05 | 0.00e+00 | 2.67e+06 | 4.01e+06 | 1.08e+05 |
| Eu-154 | 7.54e+06 | 9.84e+05 | 6.88e+05 | 0.00e+00 | 4.35e+06 | 7.30e+06 | 2.67e+05 |
| Eu-155 | 1.60e+06 | 1.57e+05 | 9.68e+04 | 0.00e+00 | 6.12e+05 | 1.21e+07 | 4.78e+05 |
| Eu-156 | 2.16e+04 | 1.62e+04 | 2.64e+03 | 0.00e+00 | 1.09e+04 | 1.10e+06 | 3.65e+05 |
| Tb-160 | 2.43e+05 | 0.00e+00 | 3.03e+04 | 0.00e+00 | 9.60e+04 | 2.38e+06 | 2.08e+05 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Inhalation Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ho-166m | 3.52e+06 | 1.09e+06 | 7.90e+05 | 0.00e+00 | 1.60e+06 | 4.99e+06 | 1.34e+05 |
| W-181 | 7.12e+01 | 2.30e+01 | 2.41e+00 | 0.00e+00 | 0.00e+00 | 2.36e+04 | 2.15e+03 |
| W-185 | 2.22e+03 | 7.34e+02 | 7.78e+01 | 0.00e+00 | 0.00e+00 | 7.68e+05 | 9.12e+04 |
| W-187 | 1.20e+01 | 9.76e+00 | 3.43e+00 | 0.00e+00 | 0.00e+00 | 4.74e+04 | 1.77e+05 |
| Pb-210 | 2.47e+08 | 6.62e+07 | 8.56e+06 | 0.00e+00 | 2.36e+08 | 3.62e+08 | 1.28e+04 |
| Bi-210 | 2.64e+03 | 1.81e+04 | 1.51e+03 | 0.00e+00 | 2.19e+05 | 1.53e+07 | 2.55e+05 |
| Po-210 | 4.54e+06 | 9.76e+06 | 1.10e+06 | 0.00e+00 | 3.37e+07 | 4.33e+08 | 3.56e+05 |
| Ra-223 | 2.06e+06 | 3.14e+03 | 4.11e+05 | 0.00e+00 | 8.96e+04 | 3.51e+08 | 2.43e+06 |
| Ra-224 | 2.26e+05 | 5.42e+02 | 4.52e+04 | 0.00e+00 | 1.54e+04 | 1.21e+08 | 2.63e+06 |
| Ra-225 | 3.42e+06 | 4.03e+03 | 6.85e+05 | 0.00e+00 | 1.15e+05 | 4.03e+08 | 2.31e+06 |
| Ra-226 | 1.06e+09 | 2.70e+04 | 7.90e+08 | 0.00e+00 | 7.74e+05 | 1.62e+09 | 2.49e+06 |
| Ra-228 | 4.27e+08 | 1.39e+04 | 4.70e+08 | 0.00e+00 | 3.98e+05 | 2.22e+09 | 4.24e+05 |
| Ac-225 | 4.83e+06 | 6.60e+06 | 3.25e+05 | 0.00e+00 | 7.58e+05 | 3.05e+08 | 2.16e+06 |
| Ac-227 | 1.99e+10 | 2.95e+09 | 1.18e+09 | 0.00e+00 | 8.56e+08 | 3.33e+09 | 4.30e+05 |
| Th-227 | 2.47e+06 | 4.45e+04 | 7.14e+04 | 0.00e+00 | 2.54e+05 | 5.20e+08 | 2.86e+06 |
| Th-228 | 2.08e+09 | 3.50e+07 | 7.02e+07 | 0.00e+00 | 1.96e+08 | 1.35e+10 | 2.96e+06 |
| Th-229 | 1.23e+11 | 3.55e+09 | 2.05e+09 | 0.00e+00 | 1.74e+10 | 4.19e+10 | 4.10e+05 |
| Th-230 | 1.87e+10 | 1.07e+09 | 5.19e+08 | 0.00e+00 | 5.24e+09 | 7.18e+09 | 3.16e+05 |
| Th-232 | 2.09e+10 | 9.12e+08 | 7.37e+06 | 0.00e+00 | 4.48e+09 | 6.88e+09 | 2.69e+05 |
| Th-234 | 1.86e+04 | 1.08e+03 | 5.37e+02 | 0.00e+00 | 6.18e+03 | 2.61e+06 | 5.99e+05 |
| Pa-231 | 4.26e+10 | 1.60e+09 | 1.66e+09 | 0.00e+00 | 8.96e+09 | 7.93e+08 | 3.77e+05 |
| Pa-233 | 1.34e+04 | 2.59e+03 | 2.31e+03 | 0.00e+00 | 9.76e+03 | 4.31e+05 | 8.00e+04 |
| U-232 | 5.85e+08 | 0.00e+00 | 4.18e+07 | 0.00e+00 | 6.35e+07 | 3.07e+09 | 3.57e+05 |
| U-233 | 1.24e+08 | 0.00e+00 | 7.54e+06 | 0.00e+00 | 2.90e+07 | 7.34e+08 | 3.30e+05 |
| U-234 | 1.18e+08 | 0.00e+00 | 7.38e+06 | 0.00e+00 | 2.84e+07 | 7.19e+08 | 3.23e+05 |
| U-235 | 1.14e+08 | 0.00e+00 | 6.94e+06 | 0.00e+00 | 2.67e+07 | 6.75e+08 | 4.10e+05 |
| U-236 | 1.14e+08 | 0.00e+00 | 7.09e+06 | 0.00e+00 | 2.73e+07 | 6.90e+08 | 3.03e+05 |
| U-237 | 4.20e+02 | 0.00e+00 | 1.12e+02 | 0.00e+00 | 1.73e+03 | 1.41e+05 | 1.03e+05 |
| U-238 | 1.09e+08 | 0.00e+00 | 6.48e+06 | 0.00e+00 | 2.50e+07 | 6.31e+08 | 2.90e+05 |
| Np-237 | 1.31e+10 | 8.48e+09 | 5.77e+08 | 0.00e+00 | 4.28e+09 | 7.19e+08 | 4.18e+05 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Inhalation Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Np-238 | 3.38e+03 | 8.16e+02 | 5.27e+01 | 0.00e+00 | 3.10e+02 | 1.40e+05 | 1.90e+05 |
| Np-239 | 3.38e+02 | 2.88e+02 | 1.77e+01 | 0.00e+00 | 1.00e+02 | 6.49e+04 | 1.32e+05 |
| Pu-238 | 1.20e+10 | 8.24e+09 | 5.78e+08 | 0.00e+00 | 2.48e+09 | 2.50e+09 | 3.83e+05 |
| Pu-239 | 1.38e+10 | 8.96e+09 | 6.44e+08 | 0.00e+00 | 2.75e+09 | 2.34e+09 | 3.50e+05 |
| Pu-240 | 1.38e+10 | 8.96e+09 | 6.43e+08 | 0.00e+00 | 2.74e+09 | 2.34e+09 | 3.57e+05 |
| Pu-241 | 2.99e+08 | 7.65e+07 | 1.12e+07 | 0.00e+00 | 5.18e+07 | 2.08e+06 | 7.34e+03 |
| Pu-242 | 1.28e+10 | 8.64e+09 | 6.20e+08 | 0.00e+00 | 2.65e+09 | 2.26e+09 | 3.43e+05 |
| Pu-244 | 1.50e+10 | 9.92e+09 | 7.10e+08 | 0.00e+00 | 3.03e+09 | 2.58e+09 | 5.11e+05 |
| Am-241 | 1.42e+10 | 9.60e+09 | 5.68e+08 | 0.00e+00 | 4.26e+09 | 8.40e+08 | 3.90e+05 |
| Am-242m | 1.43e+10 | 9.04e+09 | 5.72e+08 | 0.00e+00 | 4.24e+09 | 3.37e+08 | 4.91e+05 |
| Am-243 | 1.42e+10 | 9.36e+09 | 5.56e+08 | 0.00e+00 | 4.17e+09 | 7.93e+08 | 4.58e+05 |
| Cm-242 | 2.54e+08 | 2.01e+08 | 1.13e+07 | 0.00e+00 | 5.12e+07 | 5.41e+08 | 4.17e+05 |
| Cm-243 | 9.52e+09 | 6.64e+09 | 4.00e+08 | 0.00e+00 | 1.87e+09 | 8.72e+08 | 4.10e+05 |
| Cm-244 | 7.35e+09 | 5.22e+09 | 3.10e+08 | 0.00e+00 | 1.45e+09 | 8.40e+08 | 3.97e+05 |
| Cm-245 | 1.46e+10 | 9.76e+09 | 6.02e+08 | 0.00e+00 | 2.82e+09 | 8.08e+08 | 3.70e+05 |
| Cm-246 | 1.45e+10 | 9.76e+09 | 6.02e+08 | 0.00e+00 | 2.81e+09 | 8.24e+08 | 3.63e+05 |
| Cm-247 | 1.42e+10 | 9.52e+09 | 5.93e+08 | 0.00e+00 | 2.77e+09 | 8.08e+08 | 4.78e+05 |
| Cm-248 | 1.18e+11 | 7.86e+10 | 4.89e+09 | 0.00e+00 | 2.28e+10 | 6.66e+09 | 7.70e+06 |
| Cf-252 | 5.73e+09 | 0.00e+00 | 2.46e+08 | 0.00e+00 | 0.00e+00 | 2.74e+09 | 1.51e+06 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Inhalation Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| H-3 | 0.00e+00 | 6.40e+02 | 6.40e+02 | 6.40e+02 | 6.40e+02 | 6.40e+02 | 6.40e+02 |
| Be-10 | 3.12e+06 | 3.64e+05 | 7.84e+04 | 0.00e+00 | 0.00e+00 | 2.74e+06 | 6.36e+04 |
| C-14 | 3.59e+04 | 6.73e+03 | 6.73e+03 | 6.73e+03 | 6.73e+03 | 6.73e+03 | 6.73e+03 |
| N-13 | 8.62e+01 | 8.62e+01 | 8.62e+01 | 8.62e+01 | 8.62e+01 | 8.62e+01 | 8.62e+01 |
| F-18 | 6.96e+03 | 0.00e+00 | 6.84e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.25e+03 |
| Na-22 | 1.63e+05 | 1.63e+05 | 1.63e+05 | 1.63e+05 | 1.63e+05 | 1.63e+05 | 1.63e+05 |
| Na-24 | 1.61e+04 | 1.61e+04 | 1.61e+04 | 1.61e+04 | 1.61e+04 | 1.61e+04 | 1.61e+04 |
| P-32 | 2.60e+06 | 1.14e+05 | 9.88e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.22e+04 |
| Ca-41 | 2.61e+05 | 0.00e+00 | 2.85e+04 | 0.00e+00 | 0.00e+00 | 2.67e+08 | 1.09e+03 |
| Sc-46 | 7.29e+05 | 9.99e+05 | 3.85e+05 | 0.00e+00 | 8.84e+05 | 0.00e+00 | 9.06e+04 |
| Cr-51 | 0.00e+00 | 0.00e+00 | 1.54e+02 | 8.55e+01 | 2.43e+01 | 1.70e+04 | 1.08e+03 |
| Mn-54 | 0.00e+00 | 4.29e+04 | 9.51e+03 | 0.00e+00 | 1.00e+04 | 1.58e+06 | 2.29e+04 |
| Mn-56 | 0.00e+00 | 1.66e+00 | 3.12e-01 | 0.00e+00 | 1.67e+00 | 1.31e+04 | 1.23e+05 |
| Fe-55 | 4.74e+04 | 2.52e+04 | 7.77e+03 | 0.00e+00 | 0.00e+00 | 1.11e+05 | 2.87e+03 |
| Fe-59 | 2.07e+04 | 3.34e+04 | 1.67e+04 | 0.00e+00 | 0.00e+00 | 1.27e+06 | 7.07e+04 |
| Co-57 | 0.00e+00 | 9.03e+02 | 1.07e+03 | 0.00e+00 | 0.00e+00 | 5.07e+05 | 1.32e+04 |
| Co-58 | 0.00e+00 | 1.77e+03 | 3.16e+03 | 0.00e+00 | 0.00e+00 | 1.11e+06 | 3.44e+04 |
| Co-60 | 0.00e+00 | 1.31e+04 | 2.26e+04 | 0.00e+00 | 0.00e+00 | 7.07e+06 | 9.62e+04 |
| Ni-59 | 6.14e+04 | 1.73e+04 | 1.05e+04 | 0.00e+00 | 0.00e+00 | 1.01e+05 | 2.33e+03 |
| Ni-63 | 8.21e+05 | 4.62e+04 | 2.80e+04 | 0.00e+00 | 0.00e+00 | 2.75e+05 | 6.33e+03 |
| Ni-65 | 2.99e+00 | 2.96e-01 | 1.64e-01 | 0.00e+00 | 0.00e+00 | 8.18e+03 | 8.40e+04 |
| Cu-64 | 0.00e+00 | 1.99e+00 | 1.07e+00 | 0.00e+00 | 6.03e+00 | 9.58e+03 | 3.67e+04 |
| Zn-65 | 4.26e+04 | 1.13e+05 | 7.03e+04 | 0.00e+00 | 7.14e+04 | 9.95e+05 | 1.63e+04 |
| Zn-69 | 6.70e-02 | 9.66e-02 | 8.92e-03 | 0.00e+00 | 5.85e-02 | 1.42e+03 | 1.02e+04 |
| Zn-69m | 1.58e+01 | 2.69e+01 | 3.18e+00 | 0.00e+00 | 1.56e+01 | 2.72e+04 | 1.00e+05 |
| Se-79 | 0.00e+00 | 4.55e+03 | 9.62e+02 | 0.00e+00 | 6.33e+03 | 5.51e+05 | 1.27e+04 |
| Br-82 | 0.00e+00 | 0.00e+00 | 2.09e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-83 | 0.00e+00 | 0.00e+00 | 4.74e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-84 | 0.00e+00 | 0.00e+00 | 5.48e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-85 | 0.00e+00 | 0.00e+00 | 2.53e+01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Inhalation Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Rb-86 | 0.00e+00 | 1.98e+05 | 1.14e+05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.99e+03 |
| Rb-87 | 0.00e+00 | 1.17e+05 | 5.07e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.10e+03 |
| Rb-88 | 0.00e+00 | 5.62e+02 | 3.66e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.72e+01 |
| Rb-89 | 0.00e+00 | 3.45e+02 | 2.90e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.89e+00 |
| Sr-89 | 5.99e+05 | 0.00e+00 | 1.72e+04 | 0.00e+00 | 0.00e+00 | 2.16e+06 | 1.67e+05 |
| Sr-90 | 3.85e+07 | 0.00e+00 | 7.66e+05 | 0.00e+00 | 0.00e+00 | 1.48e+07 | 3.43e+05 |
| Sr-91 | 1.21e+02 | 0.00e+00 | 4.59e+00 | 0.00e+00 | 0.00e+00 | 5.33e+04 | 1.74e+05 |
| Sr-92 | 1.31e+01 | 0.00e+00 | 5.25e-01 | 0.00e+00 | 0.00e+00 | 2.40e+04 | 2.42e+05 |
| Y-90 | 4.11e+03 | 0.00e+00 | 1.11e+02 | 0.00e+00 | 0.00e+00 | 2.62e+05 | 2.68e+05 |
| Y-91 | 9.14e+05 | 0.00e+00 | 2.44e+04 | 0.00e+00 | 0.00e+00 | 2.63e+06 | 1.84e+05 |
| Y-91m | 5.07e-01 | 0.00e+00 | 1.84e-02 | 0.00e+00 | 0.00e+00 | 2.81e+03 | 1.72e+03 |
| Y-92 | 2.03e+01 | 0.00e+00 | 5.81e-01 | 0.00e+00 | 0.00e+00 | 2.39e+04 | 2.39e+05 |
| Y-93 | 1.86e+02 | 0.00e+00 | 5.11e+00 | 0.00e+00 | 0.00e+00 | 7.44e+04 | 3.88e+05 |
| Zr-93 | 7.66e+05 | 2.89e+04 | 2.05e+04 | 0.00e+00 | 1.11e+05 | 2.63e+05 | 5.44e+03 |
| Zr-95 | 1.90e+05 | 4.18e+04 | 3.70e+04 | 0.00e+00 | 5.96e+04 | 2.23e+06 | 6.11e+04 |
| Zr-97 | 1.88e+02 | 2.72e+01 | 1.60e+01 | 0.00e+00 | 3.88e+01 | 1.13e+05 | 3.51e+05 |
| Nb-93m | 4.70e+05 | 1.17e+05 | 3.85e+04 | 0.00e+00 | 1.27e+05 | 3.85e+05 | 9.06e+03 |
| Nb-95 | 2.35e+04 | 9.18e+03 | 6.55e+03 | 0.00e+00 | 8.62e+03 | 6.14e+05 | 3.70e+04 |
| Nb-97 | 4.29e-01 | 7.70e-02 | 3.60e-02 | 0.00e+00 | 8.55e-02 | 3.42e+03 | 2.78e+04 |
| Mo-93 | 0.00e+00 | 1.39e+04 | 5.00e+02 | 0.00e+00 | 3.92e+03 | 6.29e+05 | 1.40e+04 |
| Mo-99 | 0.00e+00 | 1.72e+02 | 4.26e+01 | 0.00e+00 | 3.92e+02 | 1.35e+05 | 1.27e+05 |
| Tc-101 | 8.10e-05 | 8.51e-05 | 1.08e-03 | 0.00e+00 | 1.45e-03 | 5.85e+02 | 1.63e+01 |
| Tc-99 | 4.96e+02 | 5.51e+02 | 1.98e+02 | 0.00e+00 | 6.48e+03 | 1.25e+06 | 2.87e+04 |
| Tc-99m | 1.78e-03 | 3.48e-03 | 5.77e-02 | 0.00e+00 | 5.07e-02 | 9.51e+02 | 4.81e+03 |
| Ru-103 | 2.79e+03 | 0.00e+00 | 1.07e+03 | 0.00e+00 | 7.03e+03 | 6.62e+05 | 4.48e+04 |
| Ru-105 | 1.53e+00 | 0.00e+00 | 5.55e-01 | 0.00e+00 | 1.34e+00 | 1.59e+04 | 9.95e+04 |
| Ru-106 | 1.36e+05 | 0.00e+00 | 1.69e+04 | 0.00e+00 | 1.84e+05 | 1.43e+07 | 4.29e+05 |
| Rh-105 | 1.45e+01 | 7.77e+00 | 6.62e+00 | 0.00e+00 | 3.10e+01 | 2.89e+04 | 4.92e+04 |
| Pd-107 | 0.00e+00 | 9.80e+02 | 9.29e+01 | 0.00e+00 | 7.29e+03 | 1.17e+05 | 2.69e+03 |
| Pd-109 | 0.00e+00 | 5.48e+00 | 1.83e+00 | 0.00e+00 | 2.61e+01 | 2.28e+04 | 9.58e+04 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Inhalation Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ag-110m | 1.69e+04 | 1.14e+04 | 9.14e+03 | 0.00e+00 | 2.12e+04 | 5.48e+06 | 1.00e+05 |
| Ag-111 | 6.70e+02 | 2.10e+02 | 1.39e+02 | 0.00e+00 | 6.33e+02 | 2.86e+05 | 1.10e+05 |
| Cd-113m | 0.00e+00 | 1.82e+06 | 7.84e+04 | 0.00e+00 | 1.90e+06 | 2.57e+06 | 6.03e+04 |
| Cd-115m | 0.00e+00 | 2.92e+05 | 1.25e+04 | 0.00e+00 | 2.19e+05 | 2.17e+06 | 1.84e+05 |
| Sn-123 | 4.77e+05 | 7.92e+03 | 1.55e+04 | 8.40e+03 | 0.00e+00 | 3.55e+06 | 1.50e+05 |
| Sn-125 | 1.83e+04 | 3.68e+02 | 1.09e+03 | 3.81e+02 | 0.00e+00 | 8.99e+05 | 2.65e+05 |
| Sn-126 | 2.31e+06 | 3.85e+04 | 8.73e+04 | 1.05e+04 | 0.00e+00 | 1.12e+07 | 6.03e+04 |
| Sb-124 | 5.74e+04 | 7.40e+02 | 2.00e+04 | 1.26e+02 | 0.00e+00 | 3.24e+06 | 1.64e+05 |
| Sb-125 | 9.84e+04 | 7.58e+02 | 2.07e+04 | 9.10e+01 | 0.00e+00 | 2.32e+06 | 4.03e+04 |
| Sb-126 | 6.36e+03 | 9.69e+01 | 2.28e+03 | 3.70e+01 | 0.00e+00 | 1.06e+06 | 2.10e+05 |
| Sb-127 | 5.03e+02 | 7.73e+00 | 1.74e+02 | 5.59e+00 | 0.00e+00 | 2.28e+05 | 1.41e+05 |
| Te-125m | 6.73e+03 | 2.33e+03 | 9.14e+02 | 1.92e+03 | 0.00e+00 | 4.77e+05 | 3.38e+04 |
| Te-127 | 2.77e+00 | 9.51e-01 | 6.10e-01 | 1.96e+00 | 7.07e+00 | 1.00e+04 | 5.62e+04 |
| Te-127m | 2.49e+04 | 8.55e+03 | 3.02e+03 | 6.07e+03 | 6.36e+04 | 1.48e+06 | 7.14e+04 |
| Te-129 | 9.77e-02 | 3.50e-02 | 2.38e-02 | 7.14e-02 | 2.57e-01 | 2.93e+03 | 2.55e+04 |
| Te-129m | 1.92e+04 | 6.84e+03 | 3.04e+03 | 6.33e+03 | 5.03e+04 | 1.76e+06 | 1.82e+05 |
| Te-131 | 2.17e-02 | 8.44e-03 | 6.59e-03 | 1.70e-02 | 5.88e-02 | 2.05e+03 | 1.33e+03 |
| Te-131m | 1.34e+02 | 5.92e+01 | 5.07e+01 | 9.77e+01 | 4.00e+02 | 2.06e+05 | 3.08e+05 |
| Te-132 | 4.81e+02 | 2.72e+02 | 2.63e+02 | 3.17e+02 | 1.77e+03 | 3.77e+05 | 1.38e+05 |
| Te-133m | 1.08e-01 | 5.59e-02 | 5.55e-02 | 8.58e-02 | 3.74e-01 | 5.92e+03 | 1.76e+04 |
| Te-134 | 5.66e-02 | 3.26e-02 | 3.48e-02 | 4.59e-02 | 2.11e-01 | 4.55e+03 | 1.80e+03 |
| I-129 | 3.88e+04 | 2.37e+04 | 2.11e+04 | 1.58e+07 | 4.00e+04 | 0.00e+00 | 7.96e+02 |
| I-130 | 8.18e+03 | 1.64e+04 | 8.44e+03 | 1.85e+06 | 2.45e+04 | 0.00e+00 | 5.11e+03 |
| I-131 | 4.81e+04 | 4.81e+04 | 2.73e+04 | 1.62e+07 | 7.88e+04 | 0.00e+00 | 2.84e+03 |
| I-132 | 2.12e+03 | 4.07e+03 | 1.88e+03 | 1.94e+05 | 6.25e+03 | 0.00e+00 | 3.20e+03 |
| I-133 | 1.66e+04 | 2.03e+04 | 7.70e+03 | 3.85e+06 | 3.38e+04 | 0.00e+00 | 5.48e+03 |
| I-134 | 1.17e+03 | 2.16e+03 | 9.95e+02 | 5.07e+04 | 3.30e+03 | 0.00e+00 | 9.55e+02 |
| I-135 | 4.92e+03 | 8.73e+03 | 4.14e+03 | 7.92e+05 | 1.34e+04 | 0.00e+00 | 4.44e+03 |
| Cs-134 | 6.51e+05 | 1.01e+06 | 2.25e+05 | 0.00e+00 | 3.30e+05 | 1.21e+05 | 3.85e+03 |
| Cs-134m | 2.34e+02 | 3.30e+02 | 2.26e+02 | 0.00e+00 | 1.83e+02 | 3.09e+01 | 2.93e+02 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Inhalation Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Cs-135 | 2.31e+05 | 1.53e+05 | 1.65e+04 | 0.00e+00 | 5.66e+04 | 1.93e+04 | 8.03e+02 |
| Cs-136 | 6.51e+04 | 1.71e+05 | 1.16e+05 | 0.00e+00 | 9.55e+04 | 1.45e+04 | 4.18e+03 |
| Cs-137 | 9.06e+05 | 8.25e+05 | 1.28e+05 | 0.00e+00 | 2.82e+05 | 1.04e+05 | 3.62e+03 |
| Cs-138 | 6.33e+02 | 8.40e+02 | 5.55e+02 | 0.00e+00 | 6.22e+02 | 6.81e+01 | 2.70e+02 |
| Cs-139 | 4.03e+02 | 4.26e+02 | 2.15e+02 | 0.00e+00 | 3.36e+02 | 3.46e+01 | 2.68e-02 |
| Ba-139 | 1.84e+00 | 9.84e-04 | 5.36e-02 | 0.00e+00 | 8.62e-04 | 5.77e+03 | 5.77e+04 |
| Ba-140 | 7.40e+04 | 6.48e+01 | 4.33e+03 | 0.00e+00 | 2.11e+01 | 1.74e+06 | 1.02e+05 |
| Ba-141 | 1.96e-01 | 1.09e-04 | 6.36e-03 | 0.00e+00 | 9.47e-05 | 2.92e+03 | 2.75e+02 |
| Ba-142 | 5.00e-02 | 3.60e-05 | 2.79e-03 | 0.00e+00 | 2.91e-05 | 1.64e+03 | 2.74e+00 |
| La-140 | 6.44e+02 | 2.25e+02 | 7.55e+01 | 0.00e+00 | 0.00e+00 | 1.83e+05 | 2.26e+05 |
| La-141 | 8.44e+00 | 1.96e+00 | 4.26e-01 | 0.00e+00 | 0.00e+00 | 1.66e+04 | 1.62e+05 |
| La-142 | 1.30e+00 | 4.11e-01 | 1.29e-01 | 0.00e+00 | 0.00e+00 | 8.70e+03 | 7.58e+04 |
| Ce-141 | 3.92e+04 | 1.95e+04 | 2.90e+03 | 0.00e+00 | 8.55e+03 | 5.44e+05 | 5.66e+04 |
| Ce-143 | 3.66e+02 | 1.99e+02 | 2.87e+01 | 0.00e+00 | 8.36e+01 | 1.15e+05 | 1.27e+05 |
| Ce-144 | 6.77e+06 | 2.12e+06 | 3.61e+05 | 0.00e+00 | 1.17e+06 | 1.20e+07 | 3.88e+05 |
| Pr-143 | 1.85e+04 | 5.55e+03 | 9.14e+02 | 0.00e+00 | 3.00e+03 | 4.33e+05 | 9.73e+04 |
| Pr-144 | 5.96e-02 | 1.85e-02 | 3.00e-03 | 0.00e+00 | 9.77e-03 | 1.57e+03 | 1.97e+02 |
| Nd-147 | 1.08e+04 | 8.73e+03 | 6.81e+02 | 0.00e+00 | 4.81e+03 | 3.28e+05 | 8.21e+04 |
| Pm-147 | 1.30e+06 | 9.32e+04 | 5.03e+04 | 0.00e+00 | 1.65e+05 | 8.14e+05 | 2.11e+04 |
| Pm-148 | 5.96e+03 | 7.18e+02 | 4.62e+02 | 0.00e+00 | 1.22e+03 | 4.59e+05 | 2.22e+05 |
| Pm-148m | 1.22e+05 | 2.42e+04 | 2.42e+04 | 0.00e+00 | 3.60e+04 | 2.12e+06 | 1.32e+05 |
| Pm-149 | 5.44e+02 | 5.77e+01 | 3.13e+01 | 0.00e+00 | 1.02e+02 | 8.88e+04 | 1.08e+05 |
| Pm-151 | 1.32e+02 | 1.60e+01 | 1.04e+01 | 0.00e+00 | 2.72e+01 | 4.59e+04 | 9.25e+04 |
| Sm-151 | 1.16e+06 | 1.76e+05 | 5.51e+04 | 0.00e+00 | 1.81e+05 | 5.48e+05 | 1.27e+04 |
| Sm-153 | 2.68e+02 | 1.67e+02 | 1.61e+01 | 0.00e+00 | 5.07e+01 | 5.07e+04 | 6.92e+04 |
| Eu-152 | 2.75e+06 | 5.07e+05 | 5.96e+05 | 0.00e+00 | 2.12e+06 | 3.33e+06 | 4.22e+04 |
| Eu-154 | 1.01e+07 | 9.21e+05 | 8.40e+05 | 0.00e+00 | 4.03e+06 | 6.14e+06 | 1.10e+05 |
| Eu-155 | 2.07e+06 | 1.50e+05 | 1.18e+05 | 0.00e+00 | 5.59e+05 | 1.03e+06 | 1.99e+05 |
| Eu-156 | 2.92e+04 | 1.57e+04 | 3.24e+03 | 0.00e+00 | 1.01e+04 | 9.40e+05 | 1.57e+05 |
| Tb-160 | 2.88e+05 | 0.00e+00 | 3.58e+04 | 0.00e+00 | 8.58e+04 | 1.98e+06 | 8.44e+04 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Inhalation Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ho-166m | 4.96e+06 | 1.04e+06 | 8.77e+05 | 0.00e+00 | 1.48e+06 | 4.18e+06 | 6.03e+04 |
| W-181 | 9.84e+01 | 2.41e+01 | 3.33e+00 | 0.00e+00 | 0.00e+00 | 2.11e+04 | 9.66e+02 |
| W-185 | 3.07e+03 | 7.70e+02 | 1.08e+02 | 0.00e+00 | 0.00e+00 | 6.88e+05 | 4.11e+04 |
| W-187 | 1.63e+01 | 9.66e+00 | 4.33e+00 | 0.00e+00 | 0.00e+00 | 4.11e+04 | 9.10e+04 |
| Pb-210 | 2.97e+08 | 6.84e+07 | 1.18e+07 | 0.00e+00 | 2.33e+08 | 3.23e+08 | 5.74e+03 |
| Bi-210 | 3.64e+03 | 1.89e+04 | 2.09e+03 | 0.00e+00 | 2.13e+05 | 1.37e+07 | 1.19e+05 |
| Po-210 | 6.29e+06 | 1.02e+07 | 1.51e+06 | 0.00e+00 | 3.27e+07 | 3.88e+08 | 1.60e+05 |
| Ra-223 | 2.85e+06 | 3.29e+03 | 5.70e+05 | 0.00e+00 | 8.73e+04 | 3.14e+08 | 1.11e+06 |
| Ra-224 | 3.12e+05 | 5.66e+02 | 6.25e+04 | 0.00e+00 | 1.50e+04 | 1.08e+08 | 1.24e+06 |
| Ra-225 | 4.74e+06 | 4.22e+03 | 9.47e+05 | 0.00e+00 | 1.12e+05 | 3.60e+08 | 1.05e+06 |
| Ra-226 | 8.66e+08 | 2.83e+04 | 7.10e+08 | 0.00e+00 | 7.51e+05 | 1.44e+09 | 1.12e+06 |
| Ra-228 | 5.51e+08 | 1.46e+04 | 6.22e+08 | 0.00e+00 | 3.85e+05 | 1.99e+09 | 1.90e+05 |
| Ac-225 | 6.70e+06 | 6.92e+06 | 4.48e+05 | 0.00e+00 | 7.36e+05 | 2.73e+08 | 9.88e+05 |
| Ac-227 | 1.84e+10 | 2.98e+09 | 1.14e+09 | 0.00e+00 | 6.55e+08 | 2.97e+09 | 1.93e+05 |
| Th-227 | 3.42e+06 | 4.66e+04 | 9.88e+04 | 0.00e+00 | 2.47e+05 | 4.66e+08 | 1.29e+06 |
| Th-228 | 2.98e+09 | 3.85e+07 | 1.01e+08 | 0.00e+00 | 2.00e+08 | 1.24e+10 | 1.33e+06 |
| Th-229 | 8.07e+10 | 2.12e+09 | 1.34e+09 | 0.00e+00 | 1.05e+10 | 4.00e+10 | 1.85e+05 |
| Th-230 | 1.22e+10 | 6.40e+08 | 3.40e+08 | 0.00e+00 | 3.15e+09 | 6.84e+09 | 1.42e+05 |
| Th-232 | 1.36e+10 | 5.44e+08 | 4.74e+06 | 0.00e+00 | 2.69e+09 | 6.55e+09 | 1.21e+05 |
| Th-234 | 2.57e+04 | 1.14e+03 | 7.40e+02 | 0.00e+00 | 5.99e+03 | 2.33e+06 | 2.71e+05 |
| Pa-231 | 3.19e+10 | 1.06e+09 | 1.27e+09 | 0.00e+00 | 5.77e+09 | 7.10e+08 | 1.69e+05 |
| Pa-233 | 1.53e+04 | 2.40e+03 | 2.68e+03 | 0.00e+00 | 8.81e+03 | 3.61e+05 | 3.31e+04 |
| U-232 | 8.10e+08 | 0.00e+00 | 5.77e+07 | 0.00e+00 | 6.18e+07 | 2.75e+09 | 1.60e+05 |
| U-233 | 1.72e+08 | 0.00e+00 | 1.04e+07 | 0.00e+00 | 2.82e+07 | 6.55e+08 | 1.48e+05 |
| U-234 | 1.65e+08 | 0.00e+00 | 1.02e+07 | 0.00e+00 | 2.76e+07 | 6.44e+08 | 1.45e+05 |
| U-235 | 1.58e+08 | 0.00e+00 | 9.58e+06 | 0.00e+00 | 2.59e+07 | 6.03e+08 | 1.84e+05 |
| U-236 | 1.58e+08 | 0.00e+00 | 9.80e+06 | 0.00e+00 | 2.65e+07 | 6.18e+08 | 1.36e+05 |
| U-237 | 5.81e+02 | 0.00e+00 | 1.54e+02 | 0.00e+00 | 1.68e+03 | 1.26e+05 | 4.77e+04 |
| U-238 | 1.51e+08 | 0.00e+00 | 8.95e+06 | 0.00e+00 | 2.42e+07 | 5.66e+08 | 1.30e+05 |
| Np-237 | 1.01e+10 | 5.99e+09 | 4.40e+08 | 0.00e+00 | 2.74e+09 | 6.44e+08 | 1.87e+05 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Inhalation Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Np-238 | 4.66e+03 | 8.51e+02 | 7.29e+01 | 0.00e+00 | 3.02e+02 | 1.25e+05 | 9.25e+04 |
| Np-239 | 4.66e+02 | 3.01e+02 | 2.35e+01 | 0.00e+00 | 9.73e+01 | 5.81e+04 | 6.40e+04 |
| Pu-238 | 9.44e+09 | 5.92e+09 | 4.48e+08 | 0.00e+00 | 1.65e+09 | 2.25e+09 | 1.72e+05 |
| Pu-239 | 1.03e+10 | 6.22e+09 | 4.74e+08 | 0.00e+00 | 1.77e+09 | 2.12e+09 | 1.57e+05 |
| Pu-240 | 1.03e+10 | 6.22e+09 | 4.70e+08 | 0.00e+00 | 1.76e+09 | 2.11e+09 | 1.60e+05 |
| Pu-241 | 2.94e+08 | 6.48e+07 | 1.08e+07 | 0.00e+00 | 4.07e+07 | 1.87e+06 | 3.29e+03 |
| Pu-242 | 9.58e+09 | 5.99e+09 | 4.55e+08 | 0.00e+00 | 1.70e+09 | 2.04e+09 | 1.54e+05 |
| Pu-244 | 1.12e+10 | 6.84e+09 | 5.22e+08 | 0.00e+00 | 1.95e+09 | 2.33e+09 | 2.29e+05 |
| Am-241 | 1.10e+10 | 6.81e+09 | 4.59e+08 | 0.00e+00 | 2.82e+09 | 7.47e+08 | 1.75e+05 |
| Am-242m | 1.14e+10 | 6.51e+09 | 4.70e+08 | 0.00e+00 | 2.85e+09 | 3.01e+08 | 2.21e+05 |
| Am-243 | 1.09e+10 | 6.59e+09 | 4.44e+08 | 0.00e+00 | 2.75e+09 | 7.10e+08 | 2.05e+05 |
| Cm-242 | 3.51e+08 | 2.10e+08 | 1.55e+07 | 0.00e+00 | 4.96e+07 | 4.85e+08 | 1.87e+05 |
| Cm-243 | 8.58e+09 | 5.25e+09 | 3.68e+08 | 0.00e+00 | 1.38e+09 | 7.77e+08 | 1.84e+05 |
| Cm-244 | 7.18e+09 | 4.37e+09 | 3.07e+08 | 0.00e+00 | 1.13e+09 | 7.47e+08 | 1.78e+05 |
| Cm-245 | 1.13e+10 | 6.81e+09 | 4.74e+08 | 0.00e+00 | 1.86e+09 | 7.22e+08 | 1.66e+05 |
| Cm-246 | 1.12e+10 | 6.81e+09 | 4.74e+08 | 0.00e+00 | 1.86e+09 | 7.36e+08 | 1.63e+05 |
| Cm-247 | 1.09e+10 | 6.73e+09 | 4.66e+08 | 0.00e+00 | 1.83e+09 | 7.22e+08 | 2.15e+05 |
| Cm-248 | 9.06e+10 | 5.55e+10 | 3.85e+09 | 0.00e+00 | 1.51e+10 | 5.96e+09 | 3.46e+06 |
| Cf-252 | 8.07e+09 | 0.00e+00 | 3.45e+08 | 0.00e+00 | 0.00e+00 | 2.45e+09 | 6.81e+05 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Inhalation Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| H-3 | 0.00e+00 | 3.68e+02 | 3.68e+02 | 3.68e+02 | 3.68e+02 | 3.68e+02 | 3.68e+02 |
| Be-10 | 1.33e+06 | 1.75e+05 | 3.71e+04 | 0.00e+00 | 0.00e+00 | 2.09e+06 | 2.42e+04 |
| C-14 | 2.65e+04 | 5.31e+03 | 5.31e+03 | 5.31e+03 | 5.31e+03 | 5.31e+03 | 5.31e+03 |
| N-13 | 6.15e+01 | 6.15e+01 | 6.15e+01 | 6.15e+01 | 6.15e+01 | 6.15e+01 | 6.15e+01 |
| F-18 | 5.49e+03 | 0.00e+00 | 4.66e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 8.54e+02 |
| Na-22 | 1.03e+05 | 1.03e+05 | 1.03e+05 | 1.03e+05 | 1.03e+05 | 1.03e+05 | 1.03e+05 |
| Na-24 | 1.06e+04 | 1.06e+04 | 1.06e+04 | 1.06e+04 | 1.06e+04 | 1.06e+04 | 1.06e+04 |
| P-32 | 2.03e+06 | 1.12e+05 | 7.74e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.61e+04 |
| Ca-41 | 1.05e+05 | 0.00e+00 | 1.14e+04 | 0.00e+00 | 0.00e+00 | 9.72e+07 | 4.14e+02 |
| Sc-46 | 5.25e+05 | 7.57e+05 | 2.37e+05 | 0.00e+00 | 4.98e+05 | 0.00e+00 | 3.07e+04 |
| Cr-51 | 0.00e+00 | 0.00e+00 | 8.95e+01 | 5.75e+01 | 1.32e+01 | 1.28e+04 | 3.57e+02 |
| Mn-54 | 0.00e+00 | 2.53e+04 | 4.98e+03 | 0.00e+00 | 4.98e+03 | 1.00e+06 | 7.06e+03 |
| Mn-56 | 0.00e+00 | 1.54e+00 | 2.21e-01 | 0.00e+00 | 1.10e+00 | 1.25e+04 | 7.17e+04 |
| Fe-55 | 1.97e+04 | 1.17e+04 | 3.33e+03 | 0.00e+00 | 0.00e+00 | 8.69e+04 | 1.09e+03 |
| Fe-59 | 1.36e+04 | 2.35e+04 | 9.48e+03 | 0.00e+00 | 0.00e+00 | 1.01e+06 | 2.48e+04 |
| Co-57 | 0.00e+00 | 6.51e+02 | 6.41e+02 | 0.00e+00 | 0.00e+00 | 3.79e+05 | 4.86e+03 |
| Co-58 | 0.00e+00 | 1.22e+03 | 1.82e+03 | 0.00e+00 | 0.00e+00 | 7.77e+05 | 1.11e+04 |
| Co-60 | 0.00e+00 | 8.02e+03 | 1.18e+04 | 0.00e+00 | 0.00e+00 | 4.51e+06 | 3.19e+04 |
| Ni-59 | 2.53e+04 | 7.62e+03 | 4.34e+03 | 0.00e+00 | 0.00e+00 | 7.67e+04 | 8.88e+02 |
| Ni-63 | 3.39e+05 | 2.04e+04 | 1.16e+04 | 0.00e+00 | 0.00e+00 | 2.09e+05 | 2.42e+03 |
| Ni-65 | 2.39e+00 | 2.84e-01 | 1.23e-01 | 0.00e+00 | 0.00e+00 | 8.12e+03 | 5.01e+04 |
| Cu-64 | 0.00e+00 | 1.88e+00 | 7.74e-01 | 0.00e+00 | 3.98e+00 | 9.30e+03 | 1.50e+04 |
| Zn-65 | 1.93e+04 | 6.26e+04 | 3.11e+04 | 0.00e+00 | 3.25e+04 | 6.47e+05 | 5.14e+04 |
| Zn-69 | 5.39e-02 | 9.67e-02 | 7.18e-03 | 0.00e+00 | 4.02e-02 | 1.47e+03 | 1.32e+04 |
| Zn-69m | 1.26e+01 | 2.58e+01 | 2.34e+00 | 0.00e+00 | 1.04e+01 | 2.67e+04 | 4.09e+04 |
| Se-79 | 0.00e+00 | 3.15e+03 | 5.88e+02 | 0.00e+00 | 3.46e+03 | 4.19e+05 | 4.84e+03 |
| Br-82 | 0.00e+00 | 0.00e+00 | 1.33e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-83 | 0.00e+00 | 0.00e+00 | 3.81e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-84 | 0.00e+00 | 0.00e+00 | 4.00e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-85 | 0.00e+00 | 0.00e+00 | 2.04e+01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Inhalation Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Rb-86 | 0.00e+00 | 1.90e+05 | 8.82e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.04e+03 |
| Rb-87 | 0.00e+00 | 9.95e+04 | 3.70e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.19e+02 |
| Rb-88 | 0.00e+00 | 5.57e+02 | 2.87e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.39e+02 |
| Rb-89 | 0.00e+00 | 3.21e+02 | 2.06e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.82e+01 |
| Sr-89 | 3.98e+05 | 0.00e+00 | 1.14e+04 | 0.00e+00 | 0.00e+00 | 2.03e+06 | 6.40e+04 |
| Sr-90 | 1.55e+07 | 0.00e+00 | 3.12e+05 | 0.00e+00 | 0.00e+00 | 1.12e+07 | 1.31e+05 |
| Sr-91 | 9.56e+01 | 0.00e+00 | 3.46e+00 | 0.00e+00 | 0.00e+00 | 5.26e+04 | 7.34e+04 |
| Sr-92 | 1.05e+01 | 0.00e+00 | 3.91e-01 | 0.00e+00 | 0.00e+00 | 2.38e+04 | 1.40e+05 |
| Y-90 | 3.29e+03 | 0.00e+00 | 8.82e+01 | 0.00e+00 | 0.00e+00 | 2.69e+05 | 1.04e+05 |
| Y-91 | 5.88e+05 | 0.00e+00 | 1.57e+04 | 0.00e+00 | 0.00e+00 | 2.45e+06 | 7.03e+04 |
| Y-91m | 4.07e-01 | 0.00e+00 | 1.39e-02 | 0.00e+00 | 0.00e+00 | 2.79e+03 | 2.35e+03 |
| Y-92 | 1.64e+01 | 0.00e+00 | 4.61e-01 | 0.00e+00 | 0.00e+00 | 2.45e+04 | 1.27e+05 |
| Y-93 | 1.50e+02 | 0.00e+00 | 4.07e+00 | 0.00e+00 | 0.00e+00 | 7.64e+04 | 1.67e+05 |
| Zr-93 | 3.14e+05 | 1.33e+04 | 8.65e+03 | 0.00e+00 | 4.47e+04 | 1.92e+05 | 2.07e+03 |
| Zr-95 | 1.15e+05 | 2.79e+04 | 2.03e+04 | 0.00e+00 | 3.11e+04 | 1.75e+06 | 2.17e+04 |
| Zr-97 | 1.50e+02 | 2.56e+01 | 1.17e+01 | 0.00e+00 | 2.59e+01 | 1.10e+05 | 1.40e+05 |
| Nb-93m | 1.93e+05 | 5.03e+04 | 1.61e+04 | 0.00e+00 | 5.15e+04 | 2.93e+05 | 3.46e+03 |
| Nb-95 | 1.57e+04 | 6.43e+03 | 3.78e+03 | 0.00e+00 | 4.72e+03 | 4.79e+05 | 1.27e+04 |
| Nb-97 | 3.42e-01 | 7.29e-02 | 2.63e-02 | 0.00e+00 | 5.70e-02 | 3.32e+03 | 2.69e+04 |
| Mo-93 | 0.00e+00 | 9.04e+03 | 3.11e+02 | 0.00e+00 | 2.16e+03 | 4.76e+05 | 5.26e+03 |
| Mo-99 | 0.00e+00 | 1.65e+02 | 3.23e+01 | 0.00e+00 | 2.65e+02 | 1.35e+05 | 4.87e+04 |
| Tc-101 | 6.51e-05 | 8.23e-05 | 8.12e-04 | 0.00e+00 | 9.79e-04 | 5.84e+02 | 8.44e+02 |
| Tc-99 | 2.93e+02 | 3.75e+02 | 1.24e+02 | 0.00e+00 | 3.49e+03 | 9.48e+05 | 1.09e+04 |
| Tc-99m | 1.40e-03 | 2.88e-03 | 3.72e-02 | 0.00e+00 | 3.11e-02 | 8.11e+02 | 2.03e+03 |
| Ru-103 | 2.02e+03 | 0.00e+00 | 6.79e+02 | 0.00e+00 | 4.24e+03 | 5.52e+05 | 1.61e+04 |
| Ru-105 | 1.22e+00 | 0.00e+00 | 4.10e-01 | 0.00e+00 | 8.99e-01 | 1.57e+04 | 4.84e+04 |
| Ru-106 | 8.68e+04 | 0.00e+00 | 1.09e+04 | 0.00e+00 | 1.07e+05 | 1.16e+07 | 1.64e+05 |
| Rh-105 | 1.16e+01 | 7.57e+00 | 5.08e+00 | 0.00e+00 | 2.10e+01 | 2.91e+04 | 1.92e+04 |
| Pd-107 | 0.00e+00 | 6.89e+02 | 5.75e+01 | 0.00e+00 | 3.85e+03 | 8.88e+04 | 1.03e+03 |
| Pd-109 | 0.00e+00 | 5.49e+00 | 1.47e+00 | 0.00e+00 | 1.79e+01 | 2.35e+04 | 3.99e+04 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Inhalation Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ag-110m | 9.98e+03 | 7.22e+03 | 5.00e+03 | 0.00e+00 | 1.09e+04 | 3.67e+06 | 3.30e+04 |
| Ag-111 | 5.25e+02 | 2.03e+02 | 1.08e+02 | 0.00e+00 | 4.27e+02 | 2.88e+05 | 4.23e+04 |
| Cd-113m | 0.00e+00 | 9.34e+05 | 3.70e+04 | 0.00e+00 | 8.12e+05 | 1.96e+06 | 2.31e+04 |
| Cd-115m | 0.00e+00 | 2.42e+05 | 8.67e+03 | 0.00e+00 | 1.32e+05 | 2.06e+06 | 7.03e+04 |
| Sn-123 | 2.93e+05 | 5.89e+03 | 1.02e+04 | 5.98e+03 | 0.00e+00 | 3.11e+06 | 5.71e+04 |
| Sn-125 | 1.41e+04 | 3.51e+02 | 8.40e+02 | 3.46e+02 | 0.00e+00 | 9.00e+05 | 1.02e+05 |
| Sn-126 | 1.16e+06 | 2.02e+04 | 4.93e+04 | 5.38e+03 | 0.00e+00 | 6.90e+06 | 2.31e+04 |
| Sb-124 | 3.79e+04 | 5.56e+02 | 1.20e+04 | 1.01e+02 | 0.00e+00 | 2.65e+06 | 5.91e+04 |
| Sb-125 | 5.17e+04 | 4.77e+02 | 1.09e+04 | 6.23e+01 | 0.00e+00 | 1.64e+06 | 1.47e+04 |
| Sb-126 | 4.31e+03 | 8.41e+01 | 1.55e+03 | 3.29e+01 | 0.00e+00 | 9.63e+05 | 7.46e+04 |
| Sb-127 | 3.95e+02 | 7.06e+00 | 1.23e+02 | 5.04e+00 | 0.00e+00 | 2.16e+05 | 5.29e+04 |
| Te-125m | 4.76e+03 | 1.99e+03 | 6.58e+02 | 1.62e+03 | 0.00e+00 | 4.47e+05 | 1.29e+04 |
| Te-127 | 2.23e+00 | 9.53e-01 | 4.89e-01 | 1.85e+00 | 4.86e+00 | 1.03e+04 | 2.44e+04 |
| Te-127m | 1.67e+04 | 6.90e+03 | 2.07e+03 | 4.87e+03 | 3.75e+04 | 1.31e+06 | 2.73e+04 |
| Te-129 | 7.88e-02 | 3.47e-02 | 1.88e-02 | 6.75e-02 | 1.75e-01 | 3.00e+03 | 2.63e+04 |
| Te-129m | 1.41e+04 | 6.09e+03 | 2.23e+03 | 5.47e+03 | 3.18e+04 | 1.68e+06 | 6.90e+04 |
| Te-131 | 1.74e-02 | 8.22e-03 | 5.00e-03 | 1.58e-02 | 3.99e-02 | 2.06e+03 | 8.22e+03 |
| Te-131m | 1.07e+02 | 5.50e+01 | 3.63e+01 | 8.93e+01 | 2.65e+02 | 1.99e+05 | 1.19e+05 |
| Te-132 | 3.72e+02 | 2.37e+02 | 1.76e+02 | 2.79e+02 | 1.03e+03 | 3.40e+05 | 4.41e+04 |
| Te-133m | 8.58e-02 | 5.03e-02 | 3.84e-02 | 7.73e-02 | 2.41e-01 | 5.49e+03 | 2.23e+04 |
| Te-134 | 4.45e-02 | 2.86e-02 | 2.35e-02 | 4.07e-02 | 1.34e-01 | 4.10e+03 | 3.54e+03 |
| I-129 | 3.02e+04 | 2.23e+04 | 1.62e+04 | 1.46e+07 | 2.63e+04 | 0.00e+00 | 2.97e+02 |
| I-130 | 6.36e+03 | 1.39e+04 | 5.57e+03 | 1.60e+06 | 1.53e+04 | 0.00e+00 | 1.99e+03 |
| I-131 | 3.79e+04 | 4.44e+04 | 1.96e+04 | 1.48e+07 | 5.18e+04 | 0.00e+00 | 1.06e+03 |
| I-132 | 1.69e+03 | 3.54e+03 | 1.26e+03 | 1.69e+05 | 3.95e+03 | 0.00e+00 | 1.90e+03 |
| I-133 | 1.32e+04 | 1.92e+04 | 5.60e+03 | 3.56e+06 | 2.24e+04 | 0.00e+00 | 2.16e+03 |
| I-134 | 9.21e+02 | 1.88e+03 | 6.65e+02 | 4.45e+04 | 2.09e+03 | 0.00e+00 | 1.29e+03 |
| I-135 | 3.86e+03 | 7.60e+03 | 2.77e+03 | 6.96e+05 | 8.47e+03 | 0.00e+00 | 1.83e+03 |
| Cs-134 | 3.96e+05 | 7.03e+05 | 7.45e+04 | 0.00e+00 | 1.90e+05 | 7.97e+04 | 1.33e+03 |
| Cs-134m | 1.85e+02 | 2.94e+02 | 1.55e+02 | 0.00e+00 | 1.19e+02 | 2.80e+01 | 1.62e+02 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Inhalation Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Cs-135 | 1.40e+05 | 1.21e+05 | 6.62e+03 | 0.00e+00 | 3.61e+04 | 1.41e+04 | 3.05e+02 |
| Cs-136 | 4.83e+04 | 1.35e+05 | 5.29e+04 | 0.00e+00 | 5.64e+04 | 1.18e+04 | 1.43e+03 |
| Cs-137 | 5.49e+05 | 6.12e+05 | 4.55e+04 | 0.00e+00 | 1.72e+05 | 7.13e+04 | 1.33e+03 |
| Cs-138 | 5.05e+02 | 7.81e+02 | 3.98e+02 | 0.00e+00 | 4.10e+02 | 6.54e+01 | 8.76e+02 |
| Cs-139 | 3.25e+02 | 4.24e+02 | 1.71e+02 | 0.00e+00 | 2.31e+02 | 3.54e+01 | 1.86e+01 |
| Ba-139 | 1.48e+00 | 9.84e-04 | 4.30e-02 | 0.00e+00 | 5.92e-04 | 5.95e+03 | 5.10e+04 |
| Ba-140 | 5.60e+04 | 5.60e+01 | 2.90e+03 | 0.00e+00 | 1.34e+01 | 1.60e+06 | 3.84e+04 |
| Ba-141 | 1.57e-01 | 1.08e-04 | 4.97e-03 | 0.00e+00 | 6.50e-05 | 2.97e+03 | 4.75e+03 |
| Ba-142 | 3.98e-02 | 3.30e-05 | 1.96e-03 | 0.00e+00 | 1.90e-05 | 1.55e+03 | 6.93e+02 |
| La-140 | 5.05e+02 | 2.00e+02 | 5.15e+01 | 0.00e+00 | 0.00e+00 | 1.68e+05 | 8.48e+04 |
| La-141 | 6.79e+00 | 1.96e+00 | 3.43e-01 | 0.00e+00 | 0.00e+00 | 1.71e+04 | 8.34e+04 |
| La-142 | 1.03e+00 | 3.77e-01 | 9.04e-02 | 0.00e+00 | 0.00e+00 | 8.22e+03 | 5.95e+04 |
| Ce-141 | 2.77e+04 | 1.67e+04 | 1.99e+03 | 0.00e+00 | 5.25e+03 | 5.17e+05 | 2.16e+04 |
| Ce-143 | 2.93e+02 | 1.93e+02 | 2.21e+01 | 0.00e+00 | 5.64e+01 | 1.16e+05 | 4.97e+04 |
| Ce-144 | 3.19e+06 | 1.21e+06 | 1.76e+05 | 0.00e+00 | 5.38e+05 | 9.84e+06 | 1.48e+05 |
| Pr-143 | 1.40e+04 | 5.24e+03 | 6.99e+02 | 0.00e+00 | 1.97e+03 | 4.33e+05 | 3.72e+04 |
| Pr-144 | 4.79e-02 | 1.85e-02 | 2.41e-03 | 0.00e+00 | 6.72e-03 | 1.61e+03 | 4.28e+03 |
| Nd-147 | 7.94e+03 | 8.13e+03 | 5.00e+02 | 0.00e+00 | 3.15e+03 | 3.22e+05 | 3.12e+04 |
| Pm-147 | 5.47e+05 | 4.30e+04 | 2.18e+04 | 0.00e+00 | 6.90e+04 | 6.37e+05 | 8.05e+03 |
| Pm-148 | 4.68e+03 | 6.75e+02 | 3.42e+02 | 0.00e+00 | 8.06e+02 | 4.48e+05 | 8.46e+04 |
| Pm-148m | 7.00e+04 | 1.74e+04 | 1.39e+04 | 0.00e+00 | 2.03e+04 | 1.71e+06 | 4.72e+04 |
| Pm-149 | 4.34e+02 | 5.71e+01 | 2.49e+01 | 0.00e+00 | 6.94e+01 | 9.10e+04 | 4.21e+04 |
| Pm-151 | 1.05e+02 | 1.54e+01 | 7.77e+00 | 0.00e+00 | 1.82e+01 | 4.55e+04 | 3.61e+04 |
| Sm-151 | 4.73e+05 | 9.03e+04 | 2.28e+04 | 0.00e+00 | 7.34e+04 | 4.17e+05 | 4.84e+03 |
| Sm-153 | 2.14e+02 | 1.65e+02 | 1.27e+01 | 0.00e+00 | 3.46e+01 | 5.18e+04 | 2.70e+04 |
| Eu-152 | 1.10e+06 | 2.48e+05 | 2.41e+05 | 0.00e+00 | 8.32e+05 | 2.07e+06 | 1.38e+04 |
| Eu-154 | 4.14e+06 | 4.84e+05 | 3.43e+05 | 0.00e+00 | 1.60e+06 | 4.27e+06 | 3.98e+04 |
| Eu-155 | 8.36e+05 | 8.01e+04 | 4.84e+04 | 0.00e+00 | 2.21e+05 | 7.28e+05 | 7.27e+04 |
| Eu-156 | 2.18e+04 | 1.34e+04 | 2.16e+03 | 0.00e+00 | 6.27e+03 | 8.57e+05 | 5.80e+04 |
| Tb-160 | 1.57e+05 | 0.00e+00 | 1.96e+04 | 0.00e+00 | 4.48e+04 | 1.55e+06 | 3.00e+04 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Inhalation Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ho-166m | 2.03e+06 | 4.30e+05 | 3.51e+05 | 0.00e+00 | 5.91e+05 | 2.87e+06 | 2.31e+04 |
| W-181 | 6.80e+01 | 2.04e+01 | 2.34e+00 | 0.00e+00 | 0.00e+00 | 1.86e+04 | 3.68e+02 |
| W-185 | 2.20e+03 | 6.76e+02 | 7.81e+01 | 0.00e+00 | 0.00e+00 | 6.27e+05 | 1.57e+04 |
| W-187 | 1.30e+01 | 9.02e+00 | 3.12e+00 | 0.00e+00 | 0.00e+00 | 3.96e+04 | 3.56e+04 |
| Pb-210 | 1.21e+08 | 2.83e+07 | 4.80e+06 | 0.00e+00 | 9.59e+07 | 2.46e+08 | 2.20e+03 |
| Bi-210 | 2.88e+03 | 1.86e+04 | 1.65e+03 | 0.00e+00 | 1.44e+05 | 1.39e+07 | 4.58e+04 |
| Po-210 | 4.17e+06 | 7.88e+06 | 9.97e+05 | 0.00e+00 | 1.82e+07 | 3.36e+08 | 6.10e+04 |
| Ra-223 | 2.18e+06 | 3.16e+03 | 4.37e+05 | 0.00e+00 | 5.82e+04 | 3.15e+08 | 4.26e+05 |
| Ra-224 | 2.48e+05 | 5.60e+02 | 4.96e+04 | 0.00e+00 | 1.02e+04 | 1.11e+08 | 4.79e+05 |
| Ra-225 | 3.60e+06 | 4.03e+03 | 7.18e+05 | 0.00e+00 | 7.43e+04 | 3.60e+08 | 4.02e+05 |
| Ra-226 | 3.47e+08 | 2.04e+04 | 2.87e+08 | 0.00e+00 | 4.12e+05 | 1.10e+09 | 4.27e+05 |
| Ra-228 | 2.24e+08 | 1.07e+04 | 2.52e+08 | 0.00e+00 | 2.14e+05 | 1.53e+09 | 7.27e+04 |
| Ac-225 | 5.17e+06 | 6.61e+06 | 3.47e+05 | 0.00e+00 | 4.89e+05 | 2.74e+08 | 3.79e+05 |
| Ac-227 | 7.41e+09 | 1.23e+09 | 4.59e+08 | 0.00e+00 | 2.60e+08 | 2.27e+09 | 7.38e+04 |
| Th-227 | 2.55e+06 | 4.24e+04 | 7.34e+04 | 0.00e+00 | 1.58e+05 | 4.58e+08 | 4.94e+05 |
| Th-228 | 1.18e+09 | 1.54e+07 | 4.00e+07 | 0.00e+00 | 7.85e+07 | 6.51e+09 | 5.07e+05 |
| Th-229 | 3.19e+10 | 8.32e+08 | 5.33e+08 | 0.00e+00 | 1.30e+09 | 1.78e+10 | 7.03e+04 |
| Th-230 | 4.84e+09 | 2.51e+08 | 1.35e+08 | 0.00e+00 | 1.23e+09 | 3.05e+09 | 5.42e+04 |
| Th-232 | 5.40e+09 | 2.14e+08 | 3.21e+06 | 0.00e+00 | 1.06e+09 | 2.93e+09 | 4.61e+04 |
| Th-234 | 1.86e+04 | 1.00e+03 | 5.38e+02 | 0.00e+00 | 3.78e+03 | 2.27e+06 | 1.04e+05 |
| Pa-231 | 1.27e+10 | 4.20e+08 | 5.07e+08 | 0.00e+00 | 2.27e+09 | 5.39e+08 | 6.45e+04 |
| Pa-233 | 9.58e+03 | 1.85e+03 | 1.67e+03 | 0.00e+00 | 5.15e+03 | 3.07e+05 | 1.27e+04 |
| U-232 | 3.60e+08 | 0.00e+00 | 2.98e+07 | 0.00e+00 | 3.36e+07 | 2.09e+09 | 6.10e+04 |
| U-233 | 7.62e+07 | 0.00e+00 | 5.36e+06 | 0.00e+00 | 1.53e+07 | 4.98e+08 | 5.64e+04 |
| U-234 | 7.31e+07 | 0.00e+00 | 5.25e+06 | 0.00e+00 | 1.50e+07 | 4.89e+08 | 5.53e+04 |
| U-235 | 7.01e+07 | 0.00e+00 | 4.93e+06 | 0.00e+00 | 1.41e+07 | 4.59e+08 | 7.03e+04 |
| U-236 | 7.01e+07 | 0.00e+00 | 5.04e+06 | 0.00e+00 | 1.44e+07 | 4.69e+08 | 5.19e+04 |
| U-237 | 4.55e+02 | 0.00e+00 | 1.21e+02 | 0.00e+00 | 1.13e+03 | 1.28e+05 | 1.83e+04 |
| U-238 | 6.71e+07 | 0.00e+00 | 4.61e+06 | 0.00e+00 | 1.32e+07 | 4.28e+08 | 4.96e+04 |
| Np-237 | 4.03e+09 | 2.39e+09 | 1.76e+08 | 0.00e+00 | 1.08e+09 | 4.89e+08 | 7.14e+04 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Inhalation Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Np-238 | 3.74e+03 | 8.47e+02 | 5.82e+01 | 0.00e+00 | 2.06e+02 | 1.29e+05 | 3.61e+04 |
| Np-239 | 3.71e+02 | 2.98e+02 | 1.88e+01 | 0.00e+00 | 6.62e+01 | 5.95e+04 | 2.49e+04 |
| Pu-238 | 3.77e+09 | 2.35e+09 | 1.78e+08 | 0.00e+00 | 6.50e+08 | 1.26e+09 | 6.57e+04 |
| Pu-239 | 4.10e+09 | 2.46e+09 | 1.88e+08 | 0.00e+00 | 6.93e+08 | 1.19e+09 | 5.99e+04 |
| Pu-240 | 4.10e+09 | 2.45e+09 | 1.88e+08 | 0.00e+00 | 6.92e+08 | 1.19e+09 | 6.10e+04 |
| Pu-241 | 1.18e+08 | 2.59e+07 | 4.35e+06 | 0.00e+00 | 1.61e+07 | 1.07e+06 | 1.26e+03 |
| Pu-242 | 3.81e+09 | 2.37e+09 | 1.81e+08 | 0.00e+00 | 6.68e+08 | 1.14e+09 | 5.88e+04 |
| Pu-244 | 4.44e+09 | 2.72e+09 | 2.07e+08 | 0.00e+00 | 7.64e+08 | 1.31e+09 | 8.76e+04 |
| Am-241 | 4.41e+09 | 2.73e+09 | 1.83e+08 | 0.00e+00 | 1.11e+09 | 5.68e+08 | 6.69e+04 |
| Am-242m | 4.55e+09 | 2.60e+09 | 1.89e+08 | 0.00e+00 | 1.12e+09 | 2.30e+08 | 8.41e+04 |
| Am-243 | 4.34e+09 | 2.63e+09 | 1.78e+08 | 0.00e+00 | 1.08e+09 | 5.39e+08 | 7.84e+04 |
| Cm-242 | 1.79e+08 | 1.21e+08 | 7.98e+06 | 0.00e+00 | 2.37e+07 | 4.16e+08 | 7.14e+04 |
| Cm-243 | 3.46e+09 | 2.13e+09 | 1.48e+08 | 0.00e+00 | 5.47e+08 | 5.94e+08 | 7.03e+04 |
| Cm-244 | 2.90e+09 | 1.78e+09 | 1.24e+08 | 0.00e+00 | 4.49e+08 | 5.71e+08 | 6.80e+04 |
| Cm-245 | 4.51e+09 | 2.74e+09 | 1.90e+08 | 0.00e+00 | 7.32e+08 | 5.49e+08 | 6.34e+04 |
| Cm-246 | 4.48e+09 | 2.74e+09 | 1.90e+08 | 0.00e+00 | 7.32e+08 | 5.59e+08 | 6.23e+04 |
| Cm-247 | 4.35e+09 | 2.70e+09 | 1.86e+08 | 0.00e+00 | 7.21e+08 | 5.49e+08 | 8.19e+04 |
| Cm-248 | 3.61e+10 | 2.23e+10 | 1.54e+09 | 0.00e+00 | 5.94e+09 | 4.52e+09 | 1.32e+06 |
| Cf-252 | 3.32e+09 | 0.00e+00 | 1.41e+08 | 0.00e+00 | 0.00e+00 | 1.92e+09 | 2.59e+05 |

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Cow's Milk (food) Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| H-3 | 0.00e+00 | 4.35e+02 | 4.35e+02 | 4.35e+02 | 4.35e+02 | 4.35e+02 | 4.35e+02 |
| Be-10 | 2.46e+06 | 3.79e+05 | 6.14e+04 | 0.00e+00 | 2.87e+05 | 0.00e+00 | 2.07e+07 |
| C-14 | 2.63e+08 | 5.27e+07 | 5.27e+07 | 5.27e+07 | 5.27e+07 | 5.27e+07 | 5.27e+07 |
| N-13 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| F-18 | 4.65e-03 | 0.00e+00 | 5.15e-04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.38e-04 |
| Na-22 | 5.29e+09 | 5.29e+09 | 5.29e+09 | 5.29e+09 | 5.29e+09 | 5.29e+09 | 5.29e+09 |
| Na-24 | 2.44e+06 | 2.44e+06 | 2.44e+06 | 2.44e+06 | 2.44e+06 | 2.44e+06 | 2.44e+06 |
| P-32 | 1.71e+10 | 1.06e+09 | 6.61e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.92e+09 |
| Ca-41 | 1.14e+10 | 0.00e+00 | 1.24e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.14e+07 |
| Sc-46 | 1.79e+02 | 3.48e+02 | 1.01e+02 | 0.00e+00 | 3.25e+02 | 0.00e+00 | 1.70e+06 |
| Cr-51 | 0.00e+00 | 0.00e+00 | 2.86e+04 | 1.71e+04 | 6.30e+03 | 3.79e+04 | 7.19e+06 |
| Mn-54 | 0.00e+00 | 8.41e+06 | 1.61e+06 | 0.00e+00 | 2.50e+06 | 0.00e+00 | 2.58e+07 |
| Mn-56 | 0.00e+00 | 4.15e-03 | 7.37e-04 | 0.00e+00 | 5.27e-03 | 0.00e+00 | 1.33e-01 |
| Fe-55 | 2.51e+07 | 1.73e+07 | 4.05e+06 | 0.00e+00 | 0.00e+00 | 9.68e+06 | 9.95e+06 |
| Fe-59 | 2.97e+07 | 6.98e+07 | 2.68e+07 | 0.00e+00 | 0.00e+00 | 1.95e+07 | 2.33e+08 |
| Co-57 | 0.00e+00 | 1.28e+06 | 2.13e+06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.25e+07 |
| Co-58 | 0.00e+00 | 4.71e+06 | 1.06e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 9.55e+07 |
| Co-60 | 0.00e+00 | 1.64e+07 | 3.62e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.08e+08 |
| Ni-59 | 5.05e+08 | 1.73e+08 | 8.44e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.57e+07 |
| Ni-63 | 6.73e+09 | 4.66e+08 | 2.26e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 9.73e+07 |
| Ni-65 | 3.76e-01 | 4.88e-02 | 2.23e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.24e+00 |
| Cu-64 | 0.00e+00 | 2.39e+04 | 1.12e+04 | 0.00e+00 | 6.03e+04 | 0.00e+00 | 2.04e+06 |
| Zn-65 | 1.37e+09 | 4.37e+09 | 1.97e+09 | 0.00e+00 | 2.92e+09 | 0.00e+00 | 2.75e+09 |
| Zn-69 | 2.18e-12 | 4.17e-12 | 2.90e-13 | 0.00e+00 | 2.71e-12 | 0.00e+00 | 6.26e-13 |
| Zn-69m | 1.81e+05 | 4.35e+05 | 3.98e+04 | 0.00e+00 | 2.64e+05 | 0.00e+00 | 2.66e+07 |
| Se-79 | 0.00e+00 | 9.15e+08 | 1.53e+08 | 0.00e+00 | 1.58e+09 | 0.00e+00 | 1.87e+08 |
| Br-82 | 0.00e+00 | 0.00e+00 | 3.23e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.70e+07 |
| Br-83 | 0.00e+00 | 0.00e+00 | 9.87e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.42e-01 |
| Br-84 | 0.00e+00 | 0.00e+00 | 1.73e-23 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.36e-28 |
| Br-85 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Cow's Milk (food) Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Rb-86 | 0.00e+00 | 2.59e+09 | 1.21e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.12e+08 |
| Rb-87 | 0.00e+00 | 2.85e+09 | 9.92e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.34e+08 |
| Rb-88 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Rb-89 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sr-89 | 1.45e+09 | 0.00e+00 | 4.16e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.33e+08 |
| Sr-90 | 5.38e+10 | 0.00e+00 | 1.08e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.35e+09 |
| Sr-91 | 2.90e+04 | 0.00e+00 | 1.17e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.38e+05 |
| Sr-92 | 4.95e-01 | 0.00e+00 | 2.14e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 9.81e+00 |
| Y-90 | 7.09e+01 | 0.00e+00 | 1.90e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.52e+05 |
| Y-91 | 8.59e+03 | 0.00e+00 | 2.30e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.73e+06 |
| Y-91m | 6.27e-20 | 0.00e+00 | 2.43e-21 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.84e-19 |
| Y-92 | 5.64e-05 | 0.00e+00 | 1.65e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 9.88e-01 |
| Y-93 | 2.24e-01 | 0.00e+00 | 6.19e-03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.11e+03 |
| Zr-93 | 1.62e+03 | 9.04e+01 | 4.21e+01 | 0.00e+00 | 3.43e+02 | 0.00e+00 | 9.39e+04 |
| Zr-95 | 9.43e+02 | 3.03e+02 | 2.05e+02 | 0.00e+00 | 4.75e+02 | 0.00e+00 | 9.59e+05 |
| Zr-97 | 4.34e-01 | 8.76e-02 | 4.01e-02 | 0.00e+00 | 1.32e-01 | 0.00e+00 | 2.71e+04 |
| Nb-93m | 4.91e+05 | 1.60e+05 | 3.95e+04 | 0.00e+00 | 1.84e+05 | 0.00e+00 | 7.40e+07 |
| Nb-95 | 8.26e+04 | 4.59e+04 | 2.47e+04 | 0.00e+00 | 4.54e+04 | 0.00e+00 | 2.79e+08 |
| Nb-97 | 6.58e-12 | 1.66e-12 | 6.07e-13 | 0.00e+00 | 1.94e-12 | 0.00e+00 | 6.14e-09 |
| Mo-93 | 0.00e+00 | 4.35e+08 | 1.18e+07 | 0.00e+00 | 1.23e+08 | 0.00e+00 | 7.07e+07 |
| Mo-99 | 0.00e+00 | 2.48e+07 | 4.72e+06 | 0.00e+00 | 5.61e+07 | 0.00e+00 | 5.74e+07 |
| Tc-101 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Tc-99 | 2.42e+07 | 3.59e+07 | 9.70e+06 | 0.00e+00 | 4.52e+08 | 3.05e+06 | 1.17e+09 |
| Tc-99m | 3.34e+00 | 9.44e+00 | 1.20e+02 | 0.00e+00 | 1.43e+02 | 4.63e+00 | 5.59e+03 |
| Ru-103 | 1.02e+03 | 0.00e+00 | 4.39e+02 | 0.00e+00 | 3.89e+03 | 0.00e+00 | 1.19e+05 |
| Ru-105 | 8.64e-04 | 0.00e+00 | 3.41e-04 | 0.00e+00 | 1.12e-02 | 0.00e+00 | 5.29e-01 |
| Ru-106 | 2.04e+04 | 0.00e+00 | 2.58e+03 | 0.00e+00 | 3.94e+04 | 0.00e+00 | 1.32e+06 |
| Rh-105 | 3.46e+05 | 2.53e+05 | 1.67e+05 | 0.00e+00 | 1.08e+06 | 0.00e+00 | 4.03e+07 |
| Pd-107 | 0.00e+00 | 1.14e+07 | 7.26e+05 | 0.00e+00 | 1.02e+08 | 0.00e+00 | 7.04e+07 |
| Pd-109 | 0.00e+00 | 4.49e+04 | 1.01e+04 | 0.00e+00 | 2.56e+05 | 0.00e+00 | 4.98e+06 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Cow's Milk (food) Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ag-110m | 5.82e+07 | 5.39e+07 | 3.20e+07 | 0.00e+00 | 1.06e+08 | 0.00e+00 | 2.20e+10 |
| Ag-111 | 6.47e+06 | 2.71e+06 | 1.35e+06 | 0.00e+00 | 8.74e+06 | 0.00e+00 | 4.97e+09 |
| Cd-113m | 0.00e+00 | 2.94e+06 | 9.43e+04 | 0.00e+00 | 3.24e+06 | 0.00e+00 | 2.37e+07 |
| Cd-115m | 0.00e+00 | 1.26e+06 | 4.02e+04 | 0.00e+00 | 9.99e+05 | 0.00e+00 | 5.30e+07 |
| Sn-123 | 5.36e+08 | 8.88e+06 | 1.31e+07 | 7.55e+06 | 0.00e+00 | 0.00e+00 | 1.09e+09 |
| Sn-125 | 5.68e+07 | 1.14e+06 | 2.58e+06 | 9.47e+05 | 0.00e+00 | 0.00e+00 | 7.09e+08 |
| Sn-126 | 1.63e+09 | 3.23e+07 | 4.64e+07 | 9.51e+06 | 0.00e+00 | 0.00e+00 | 4.69e+08 |
| Sb-124 | 2.57e+07 | 4.86e+05 | 1.02e+07 | 6.24e+04 | 0.00e+00 | 2.00e+07 | 7.31e+08 |
| Sb-125 | 2.04e+07 | 2.28e+05 | 4.86e+06 | 2.08e+04 | 0.00e+00 | 1.58e+07 | 2.25e+08 |
| Sb-126 | 5.63e+06 | 1.15e+05 | 2.03e+06 | 3.45e+04 | 0.00e+00 | 3.45e+06 | 4.60e+08 |
| Sb-127 | 4.53e+05 | 9.93e+03 | 1.74e+05 | 5.45e+03 | 0.00e+00 | 2.69e+05 | 1.04e+08 |
| Te-125m | 1.63e+07 | 5.90e+06 | 2.18e+06 | 4.90e+06 | 6.63e+07 | 0.00e+00 | 6.50e+07 |
| Te-127 | 6.56e+02 | 2.35e+02 | 1.42e+02 | 4.86e+02 | 2.67e+03 | 0.00e+00 | 5.17e+04 |
| Te-127m | 4.58e+07 | 1.64e+07 | 5.58e+06 | 1.17e+07 | 1.86e+08 | 0.00e+00 | 1.53e+08 |
| Te-129 | 2.92e-10 | 1.10e-10 | 7.11e-11 | 2.24e-10 | 1.23e-09 | 0.00e+00 | 2.20e-10 |
| Te-129m | 6.02e+07 | 2.25e+07 | 9.53e+06 | 2.07e+07 | 2.51e+08 | 0.00e+00 | 3.03e+08 |
| Te-131 | 3.95e-33 | 1.65e-33 | 1.25e-33 | 3.25e-33 | 1.73e-32 | 0.00e+00 | 5.60e-34 |
| Te-131m | 3.62e+05 | 1.77e+05 | 1.47e+05 | 2.80e+05 | 1.79e+06 | 0.00e+00 | 1.76e+07 |
| Te-132 | 2.40e+06 | 1.55e+06 | 1.46e+06 | 1.72e+06 | 1.50e+07 | 0.00e+00 | 7.35e+07 |
| Te-133m | 2.19e-13 | 1.28e-13 | 1.24e-13 | 1.86e-13 | 1.27e-12 | 0.00e+00 | 4.40e-14 |
| Te-134 | 9.41e-19 | 6.16e-19 | 3.78e-19 | 8.22e-19 | 5.95e-18 | 0.00e+00 | 1.04e-21 |
| I-129 | 7.58e+08 | 6.51e+08 | 2.14e+09 | 1.68e+12 | 1.40e+09 | 0.00e+00 | 1.03e+08 |
| I-130 | 4.21e+05 | 1.24e+06 | 4.90e+05 | 1.05e+08 | 1.94e+06 | 0.00e+00 | 1.07e+06 |
| I-131 | 2.96e+08 | 4.24e+08 | 2.43e+08 | 1.39e+11 | 7.26e+08 | 0.00e+00 | 1.12e+08 |
| I-132 | 1.67e-01 | 4.47e-01 | 1.56e-01 | 1.56e+01 | 7.12e-01 | 0.00e+00 | 8.39e-02 |
| I-133 | 3.88e+06 | 6.74e+06 | 2.06e+06 | 9.91e+08 | 1.18e+07 | 0.00e+00 | 6.06e+06 |
| I-134 | 2.11e-12 | 5.72e-12 | 2.05e-12 | 9.92e-11 | 9.10e-12 | 0.00e+00 | 4.99e-15 |
| I-135 | 1.29e+04 | 3.38e+04 | 1.25e+04 | 2.23e+06 | 5.42e+04 | 0.00e+00 | 3.82e+04 |
| Cs-134 | 5.65e+09 | 1.34e+10 | 1.10e+10 | 0.00e+00 | 4.35e+09 | 1.44e+09 | 2.35e+08 |
| Cs-134m | 1.76e-01 | 3.70e-01 | 1.89e-01 | 0.00e+00 | 2.01e-01 | 3.16e-02 | 1.31e-01 |

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# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Cow's Milk (food) Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Cs-135 | 1.81e+09 | 1.67e+09 | 7.41e+08 | 0.00e+00 | 6.32e+08 | 1.89e+08 | 3.90e+07 |
| Cs-136 | 2.63e+08 | 1.04e+09 | 7.48e+08 | 0.00e+00 | 5.78e+08 | 7.93e+07 | 1.18e+08 |
| Cs-137 | 7.38e+09 | 1.01e+10 | 6.61e+09 | 0.00e+00 | 3.43e+09 | 1.14e+09 | 1.95e+08 |
| Cs-138 | 9.72e-24 | 1.92e-23 | 9.50e-24 | 0.00e+00 | 1.41e-23 | 1.39e-24 | 8.18e-29 |
| Cs-139 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-139 | 4.54e-08 | 3.24e-11 | 1.33e-09 | 0.00e+00 | 3.03e-11 | 1.84e-11 | 8.06e-08 |
| Ba-140 | 2.69e+07 | 3.38e+04 | 1.76e+06 | 0.00e+00 | 1.15e+04 | 1.93e+04 | 5.54e+07 |
| Ba-141 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-142 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| La-140 | 4.52e+00 | 2.28e+00 | 6.01e-01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.67e+05 |
| La-141 | 3.00e-05 | 9.31e-06 | 1.52e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.11e+00 |
| La-142 | 1.90e-11 | 8.66e-12 | 2.16e-12 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.32e-08 |
| Ce-141 | 4.84e+03 | 3.28e+03 | 3.72e+02 | 0.00e+00 | 1.52e+03 | 0.00e+00 | 1.25e+07 |
| Ce-143 | 4.16e+01 | 3.08e+04 | 3.40e+00 | 0.00e+00 | 1.35e+01 | 0.00e+00 | 1.15e+06 |
| Ce-144 | 3.58e+05 | 1.50e+05 | 1.92e+04 | 0.00e+00 | 8.87e+04 | 0.00e+00 | 1.21e+08 |
| Pr-143 | 1.58e+02 | 6.33e+01 | 7.83e+00 | 0.00e+00 | 3.66e+01 | 0.00e+00 | 6.92e+05 |
| Pr-144 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Nd-147 | 9.42e+01 | 1.09e+02 | 6.51e+00 | 0.00e+00 | 6.36e+01 | 0.00e+00 | 5.22e+05 |
| Pm-147 | 2.87e+03 | 2.70e+02 | 1.09e+02 | 0.00e+00 | 5.10e+02 | 0.00e+00 | 3.40e+05 |
| Pm-148 | 5.93e+01 | 9.85e+00 | 4.96e+00 | 0.00e+00 | 1.86e+01 | 0.00e+00 | 7.74e+05 |
| Pm-148m | 8.57e+02 | 2.22e+02 | 1.70e+02 | 0.00e+00 | 3.35e+02 | 0.00e+00 | 1.88e+06 |
| Pm-149 | 4.28e+00 | 6.05e-01 | 2.47e-01 | 0.00e+00 | 1.14e+00 | 0.00e+00 | 1.13e+05 |
| Pm-151 | 6.47e-01 | 1.09e-01 | 5.48e-02 | 0.00e+00 | 1.94e-01 | 0.00e+00 | 2.99e+04 |
| Sm-151 | 2.67e+03 | 4.60e+02 | 1.10e+02 | 0.00e+00 | 5.14e+02 | 0.00e+00 | 2.03e+05 |
| Sm-153 | 1.99e+00 | 1.66e+00 | 1.21e-01 | 0.00e+00 | 5.36e-01 | 0.00e+00 | 5.92e+04 |
| Eu-152 | 7.51e+03 | 1.71e+03 | 1.50e+03 | 0.00e+00 | 1.06e+04 | 0.00e+00 | 9.86e+05 |
| Eu-154 | 2.38e+04 | 2.92e+03 | 2.08e+03 | 0.00e+00 | 1.40e+04 | 0.00e+00 | 2.12e+06 |
| Eu-155 | 3.25e+03 | 4.61e+02 | 2.97e+02 | 0.00e+00 | 2.13e+03 | 0.00e+00 | 3.62e+05 |
| Eu-156 | 2.52e+02 | 1.95e+02 | 3.14e+01 | 0.00e+00 | 1.30e+02 | 0.00e+00 | 1.33e+06 |
| Tb-160 | 1.49e+03 | 0.00e+00 | 1.86e+02 | 0.00e+00 | 6.16e+02 | 0.00e+00 | 1.37e+06 |

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# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Cow's Milk (food) Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ho-166m | 1.04e+04 | 3.26e+03 | 2.47e+03 | 0.00e+00 | 4.87e+03 | 0.00e+00 | 9.89e+05 |
| W-181 | 3.39e+04 | 1.11e+04 | 1.18e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.26e+06 |
| W-185 | 1.29e+06 | 4.32e+05 | 4.54e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.99e+07 |
| W-187 | 6.52e+03 | 5.45e+03 | 1.91e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.79e+06 |
| Pb-210 | 7.32e+10 | 2.09e+10 | 2.60e+09 | 0.00e+00 | 5.88e+10 | 0.00e+00 | 1.07e+07 |
| Bi-210 | 3.56e+05 | 2.46e+06 | 2.04e+05 | 0.00e+00 | 2.96e+07 | 0.00e+00 | 3.67e+07 |
| Po-210 | 7.42e+08 | 1.58e+09 | 1.79e+08 | 0.00e+00 | 5.25e+09 | 0.00e+00 | 1.33e+08 |
| Ra-223 | 1.22e+11 | 1.88e+08 | 2.44e+10 | 0.00e+00 | 5.33e+09 | 0.00e+00 | 7.89e+09 |
| Ra-224 | 1.41e+10 | 3.42e+07 | 2.83e+09 | 0.00e+00 | 9.65e+08 | 0.00e+00 | 2.98e+09 |
| Ra-225 | 1.90e+11 | 2.25e+08 | 3.79e+10 | 0.00e+00 | 6.39e+09 | 0.00e+00 | 8.85e+09 |
| Ra-226 | 1.87e+13 | 3.55e+08 | 1.36e+13 | 0.00e+00 | 1.01e+10 | 0.00e+00 | 2.05e+10 |
| Ra-228 | 6.87e+12 | 1.91e+08 | 7.43e+12 | 0.00e+00 | 5.42e+09 | 0.00e+00 | 3.46e+09 |
| Ac-225 | 6.17e+04 | 8.49e+04 | 4.15e+03 | 0.00e+00 | 9.67e+03 | 0.00e+00 | 5.70e+06 |
| Ac-227 | 7.21e+07 | 9.56e+06 | 4.28e+06 | 0.00e+00 | 3.09e+06 | 0.00e+00 | 3.16e+06 |
| Th-227 | 2.80e+05 | 5.06e+03 | 8.06e+03 | 0.00e+00 | 2.88e+04 | 0.00e+00 | 1.10e+07 |
| Th-228 | 1.88e+07 | 3.18e+05 | 6.35e+05 | 0.00e+00 | 1.77e+06 | 0.00e+00 | 2.13e+07 |
| Th-229 | 5.26e+08 | 1.50e+07 | 8.69e+06 | 0.00e+00 | 7.26e+07 | 0.00e+00 | 3.02e+06 |
| Th-230 | 7.96e+07 | 4.52e+06 | 2.20e+06 | 0.00e+00 | 2.18e+07 | 0.00e+00 | 2.33e+06 |
| Th-232 | 8.89e+07 | 3.86e+06 | 5.80e+04 | 0.00e+00 | 1.86e+07 | 0.00e+00 | 1.98e+06 |
| Th-234 | 1.85e+03 | 1.09e+02 | 5.33e+01 | 0.00e+00 | 6.16e+02 | 0.00e+00 | 2.61e+06 |
| Pa-231 | 1.58e+08 | 5.95e+06 | 6.14e+06 | 0.00e+00 | 3.34e+07 | 0.00e+00 | 2.77e+06 |
| Pa-233 | 1.28e+02 | 2.58e+01 | 2.22e+01 | 0.00e+00 | 9.70e+01 | 0.00e+00 | 3.99e+05 |
| U-232 | 1.59e+10 | 0.00e+00 | 1.14e+09 | 0.00e+00 | 1.73e+09 | 0.00e+00 | 2.62e+08 |
| U-233 | 3.37e+09 | 0.00e+00 | 2.04e+08 | 0.00e+00 | 7.84e+08 | 0.00e+00 | 2.42e+08 |
| U-234 | 3.23e+09 | 0.00e+00 | 2.00e+08 | 0.00e+00 | 7.69e+08 | 0.00e+00 | 2.37e+08 |
| U-235 | 3.10e+09 | 0.00e+00 | 1.88e+08 | 0.00e+00 | 7.23e+08 | 0.00e+00 | 3.02e+08 |
| U-236 | 3.10e+09 | 0.00e+00 | 1.92e+08 | 0.00e+00 | 7.38e+08 | 0.00e+00 | 2.23e+08 |
| U-237 | 5.65e+04 | 0.00e+00 | 1.50e+04 | 0.00e+00 | 2.32e+05 | 0.00e+00 | 1.99e+07 |
| U-238 | 2.96e+09 | 0.00e+00 | 1.75e+08 | 0.00e+00 | 6.76e+08 | 0.00e+00 | 2.13e+08 |
| Np-237 | 4.87e+07 | 3.46e+06 | 2.14e+06 | 0.00e+00 | 1.59e+07 | 0.00e+00 | 3.07e+06 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Adult age group by nuclide.
Waterford Steam Electric Station
Pathway : Cow's Milk (food) Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Np-238 | 3.62e+01 | 9.75e-01 | 5.63e-01 | 0.00e+00 | 3.30e+00 | 0.00e+00 | 9.06e+04 |
| Np-239 | 3.68e+00 | 3.61e-01 | 1.99e-01 | 0.00e+00 | 1.13e+00 | 0.00e+00 | 7.41e+04 |
| Pu-238 | 9.73e+06 | 1.23e+06 | 2.64e+05 | 0.00e+00 | 1.13e+06 | 0.00e+00 | 1.13e+06 |
| Pu-239 | 1.12e+07 | 1.35e+06 | 2.95e+05 | 0.00e+00 | 1.25e+06 | 0.00e+00 | 1.03e+06 |
| Pu-240 | 1.12e+07 | 1.34e+06 | 2.95e+05 | 0.00e+00 | 1.25e+06 | 0.00e+00 | 1.05e+06 |
| Pu-241 | 2.42e+05 | 1.15e+04 | 5.12e+03 | 0.00e+00 | 2.36e+04 | 0.00e+00 | 2.16e+04 |
| Pu-242 | 1.04e+07 | 1.30e+06 | 2.84e+05 | 0.00e+00 | 1.21e+06 | 0.00e+00 | 1.01e+06 |
| Pu-244 | 1.21e+07 | 1.49e+06 | 3.26e+05 | 0.00e+00 | 1.38e+06 | 0.00e+00 | 1.50e+06 |
| Am-241 | 2.89e+07 | 2.70e+07 | 2.07e+06 | 0.00e+00 | 1.56e+07 | 0.00e+00 | 2.84e+06 |
| Am-242m | 2.94e+07 | 2.56e+07 | 2.10e+06 | 0.00e+00 | 1.56e+07 | 0.00e+00 | 3.61e+06 |
| Am-243 | 2.91e+07 | 2.67e+07 | 2.05e+06 | 0.00e+00 | 1.54e+07 | 0.00e+00 | 3.36e+06 |
| Cm-242 | 7.27e+05 | 7.73e+05 | 4.83e+04 | 0.00e+00 | 2.19e+05 | 0.00e+00 | 2.79e+06 |
| Cm-243 | 2.31e+07 | 2.12e+07 | 1.45e+06 | 0.00e+00 | 6.75e+06 | 0.00e+00 | 3.01e+06 |
| Cm-244 | 1.76e+07 | 1.65e+07 | 1.11e+06 | 0.00e+00 | 5.17e+06 | 0.00e+00 | 2.91e+06 |
| Cm-245 | 3.62e+07 | 3.16e+07 | 2.23e+06 | 0.00e+00 | 1.04e+07 | 0.00e+00 | 2.72e+06 |
| Cm-246 | 3.59e+07 | 3.15e+07 | 2.22e+06 | 0.00e+00 | 1.04e+07 | 0.00e+00 | 2.67e+06 |
| Cm-247 | 3.50e+07 | 3.11e+07 | 2.19e+06 | 0.00e+00 | 1.02e+07 | 0.00e+00 | 3.51e+06 |
| Cm-248 | 2.91e+08 | 2.56e+08 | 1.80e+07 | 0.00e+00 | 8.42e+07 | 0.00e+00 | 5.68e+07 |
| Cf-252 | 9.92e+06 | 0.00e+00 | 2.39e+05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.09e+07 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Cow's Milk (food) Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| H-3 | 0.00e+00 | 5.66e+02 | 5.66e+02 | 5.66e+02 | 5.66e+02 | 5.66e+02 | 5.66e+02 |
| Be-10 | 4.47e+06 | 6.92e+05 | 1.13e+05 | 0.00e+00 | 5.29e+05 | 0.00e+00 | 2.83e+07 |
| C-14 | 4.86e+08 | 9.72e+07 | 9.72e+07 | 9.72e+07 | 9.72e+07 | 9.72e+07 | 9.72e+07 |
| N-13 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| F-18 | 8.30e-03 | 0.00e+00 | 9.10e-04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.48e-04 |
| Na-22 | 9.18e+09 | 9.18e+09 | 9.18e+09 | 9.18e+09 | 9.18e+09 | 9.18e+09 | 9.18e+09 |
| Na-24 | 4.27e+06 | 4.27e+06 | 4.27e+06 | 4.27e+06 | 4.27e+06 | 4.27e+06 | 4.27e+06 |
| P-32 | 3.15e+10 | 1.95e+09 | 1.22e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.65e+09 |
| Ca-41 | 1.57e+10 | 0.00e+00 | 1.70e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.56e+07 |
| Sc-46 | 3.04e+02 | 5.92e+02 | 1.76e+02 | 0.00e+00 | 5.67e+02 | 0.00e+00 | 2.02e+06 |
| Cr-51 | 0.00e+00 | 0.00e+00 | 4.99e+04 | 2.77e+04 | 1.09e+04 | 7.13e+04 | 8.39e+06 |
| Mn-54 | 0.00e+00 | 1.40e+07 | 2.78e+06 | 0.00e+00 | 4.18e+06 | 0.00e+00 | 2.87e+07 |
| Mn-56 | 0.00e+00 | 7.36e-03 | 1.31e-03 | 0.00e+00 | 9.32e-03 | 0.00e+00 | 4.85e-01 |
| Fe-55 | 4.45e+07 | 3.16e+07 | 7.36e+06 | 0.00e+00 | 0.00e+00 | 2.00e+07 | 1.37e+07 |
| Fe-59 | 5.18e+07 | 1.21e+08 | 4.67e+07 | 0.00e+00 | 0.00e+00 | 3.81e+07 | 2.86e+08 |
| Co-57 | 0.00e+00 | 2.24e+06 | 3.76e+06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.19e+07 |
| Co-58 | 0.00e+00 | 7.94e+06 | 1.83e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.09e+08 |
| Co-60 | 0.00e+00 | 2.78e+07 | 6.26e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.62e+08 |
| Ni-59 | 8.82e+08 | 3.11e+08 | 1.50e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.88e+07 |
| Ni-63 | 1.18e+10 | 8.35e+08 | 4.01e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.33e+08 |
| Ni-65 | 6.87e-01 | 8.78e-02 | 4.00e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.76e+00 |
| Cu-64 | 0.00e+00 | 4.26e+04 | 2.00e+04 | 0.00e+00 | 1.08e+05 | 0.00e+00 | 3.30e+06 |
| Zn-65 | 2.11e+09 | 7.32e+09 | 3.41e+09 | 0.00e+00 | 4.68e+09 | 0.00e+00 | 3.10e+09 |
| Zn-69 | 4.01e-12 | 7.65e-12 | 5.35e-13 | 0.00e+00 | 5.00e-12 | 0.00e+00 | 1.41e-11 |
| Zn-69m | 3.30e+05 | 7.79e+05 | 7.15e+04 | 0.00e+00 | 4.74e+05 | 0.00e+00 | 4.28e+07 |
| Se-79 | 0.00e+00 | 1.67e+09 | 2.81e+08 | 0.00e+00 | 2.92e+09 | 0.00e+00 | 2.56e+08 |
| Br-82 | 0.00e+00 | 0.00e+00 | 5.61e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-83 | 0.00e+00 | 0.00e+00 | 1.82e-01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-84 | 0.00e+00 | 0.00e+00 | 3.09e-23 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-85 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Cow's Milk (food) Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Rb-86 | 0.00e+00 | 4.73e+09 | 2.22e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.00e+08 |
| Rb-87 | 0.00e+00 | 5.24e+09 | 1.83e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.83e+08 |
| Rb-88 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Rb-89 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sr-89 | 2.67e+09 | 0.00e+00 | 7.66e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.19e+08 |
| Sr-90 | 8.13e+10 | 0.00e+00 | 1.63e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.86e+09 |
| Sr-91 | 5.33e+04 | 0.00e+00 | 2.12e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.42e+05 |
| Sr-92 | 9.07e-01 | 0.00e+00 | 3.86e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.31e+01 |
| Y-90 | 1.30e+02 | 0.00e+00 | 3.51e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.07e+06 |
| Y-91 | 1.58e+04 | 0.00e+00 | 4.24e+02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.48e+06 |
| Y-91m | 1.15e-19 | 0.00e+00 | 4.39e-21 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.42e-18 |
| Y-92 | 1.04e-04 | 0.00e+00 | 3.01e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.86e+00 |
| Y-93 | 4.13e-01 | 0.00e+00 | 1.13e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.26e+04 |
| Zr-93 | 2.76e+03 | 1.36e+02 | 7.43e+01 | 0.00e+00 | 4.81e+02 | 0.00e+00 | 1.29e+05 |
| Zr-95 | 1.65e+03 | 5.20e+02 | 3.58e+02 | 0.00e+00 | 7.65e+02 | 0.00e+00 | 1.20e+06 |
| Zr-97 | 7.90e-01 | 1.56e-01 | 7.20e-02 | 0.00e+00 | 2.37e-01 | 0.00e+00 | 4.23e+04 |
| Nb-93m | 8.55e+05 | 2.81e+05 | 7.03e+04 | 0.00e+00 | 3.28e+05 | 0.00e+00 | 1.01e+08 |
| Nb-95 | 1.41e+05 | 7.81e+04 | 4.30e+04 | 0.00e+00 | 7.57e+04 | 0.00e+00 | 3.34e+08 |
| Nb-97 | 1.20e-11 | 2.98e-12 | 1.09e-12 | 0.00e+00 | 3.48e-12 | 0.00e+00 | 7.11e-08 |
| Mo-93 | 0.00e+00 | 7.93e+08 | 2.17e+07 | 0.00e+00 | 2.27e+08 | 0.00e+00 | 9.65e+07 |
| Mo-99 | 0.00e+00 | 4.47e+07 | 8.53e+06 | 0.00e+00 | 1.02e+08 | 0.00e+00 | 8.01e+07 |
| Tc-101 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Tc-99 | 4.46e+07 | 6.56e+07 | 1.79e+07 | 0.00e+00 | 8.33e+08 | 6.78e+06 | 1.61e+09 |
| Tc-99m | 5.80e+00 | 1.62e+01 | 2.10e+02 | 0.00e+00 | 2.41e+02 | 8.97e+00 | 1.06e+04 |
| Ru-103 | 1.81e+03 | 0.00e+00 | 7.74e+02 | 0.00e+00 | 6.38e+03 | 0.00e+00 | 1.51e+05 |
| Ru-105 | 1.58e-03 | 0.00e+00 | 6.13e-04 | 0.00e+00 | 1.99e-02 | 0.00e+00 | 1.27e+00 |
| Ru-106 | 3.75e+04 | 0.00e+00 | 4.73e+03 | 0.00e+00 | 7.24e+04 | 0.00e+00 | 1.80e+06 |
| Rh-105 | 6.38e+05 | 4.61e+05 | 3.03e+05 | 0.00e+00 | 1.96e+06 | 0.00e+00 | 5.87e+07 |
| Pd-107 | 0.00e+00 | 2.07e+07 | 1.34e+06 | 0.00e+00 | 1.87e+08 | 0.00e+00 | 9.63e+07 |
| Pd-109 | 0.00e+00 | 8.22e+04 | 1.87e+04 | 0.00e+00 | 4.75e+05 | 0.00e+00 | 8.29e+06 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Cow's Milk (food) Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ag-110m | 9.63e+07 | 9.11e+07 | 5.54e+07 | 0.00e+00 | 1.74e+08 | 0.00e+00 | 2.56e+10 |
| Ag-111 | 1.19e+07 | 4.95e+06 | 2.49e+06 | 0.00e+00 | 1.61e+07 | 0.00e+00 | 6.90e+09 |
| Cd-113m | 0.00e+00 | 5.38e+06 | 1.73e+05 | 0.00e+00 | 5.95e+06 | 0.00e+00 | 3.23e+07 |
| Cd-115m | 0.00e+00 | 2.30e+06 | 7.41e+04 | 0.00e+00 | 1.84e+06 | 0.00e+00 | 7.27e+07 |
| Sn-123 | 9.88e+08 | 1.62e+07 | 2.40e+07 | 1.30e+07 | 0.00e+00 | 0.00e+00 | 1.49e+09 |
| Sn-125 | 1.05e+08 | 2.08e+06 | 4.72e+06 | 1.64e+06 | 0.00e+00 | 0.00e+00 | 9.85e+08 |
| Sn-126 | 2.89e+09 | 5.38e+07 | 8.23e+07 | 1.42e+07 | 0.00e+00 | 0.00e+00 | 6.43e+08 |
| Sb-124 | 4.59e+07 | 8.46e+05 | 1.79e+07 | 1.04e+05 | 0.00e+00 | 4.01e+07 | 9.25e+08 |
| Sb-125 | 3.65e+07 | 3.99e+05 | 8.55e+06 | 3.49e+04 | 0.00e+00 | 3.21e+07 | 2.84e+08 |
| Sb-126 | 1.00e+07 | 2.05e+05 | 3.61e+06 | 5.68e+04 | 0.00e+00 | 7.20e+06 | 5.94e+08 |
| Sb-127 | 8.23e+05 | 1.76e+04 | 3.11e+05 | 9.25e+03 | 0.00e+00 | 5.60e+05 | 1.40e+08 |
| Te-125m | 3.00e+07 | 1.08e+07 | 4.02e+06 | 8.39e+06 | 0.00e+00 | 0.00e+00 | 8.86e+07 |
| Te-127 | 1.22e+03 | 4.31e+02 | 2.61e+02 | 8.38e+02 | 4.92e+03 | 0.00e+00 | 9.38e+04 |
| Te-127m | 8.44e+07 | 2.99e+07 | 1.00e+07 | 2.01e+07 | 3.42e+08 | 0.00e+00 | 2.10e+08 |
| Te-129 | 5.37e-10 | 2.00e-10 | 1.31e-10 | 3.84e-10 | 2.25e-09 | 0.00e+00 | 2.94e-09 |
| Te-129m | 1.10e+08 | 4.09e+07 | 1.74e+07 | 3.55e+07 | 4.61e+08 | 0.00e+00 | 4.13e+08 |
| Te-131 | 7.22e-33 | 2.98e-33 | 2.26e-33 | 5.57e-33 | 3.16e-32 | 0.00e+00 | 5.93e-34 |
| Te-131m | 6.58e+05 | 3.15e+05 | 2.63e+05 | 4.75e+05 | 3.29e+06 | 0.00e+00 | 2.53e+07 |
| Te-132 | 4.29e+06 | 2.72e+06 | 2.56e+06 | 2.87e+06 | 2.61e+07 | 0.00e+00 | 8.61e+07 |
| Te-133m | 3.95e-13 | 2.24e-13 | 2.18e-13 | 3.13e-13 | 2.22e-12 | 0.00e+00 | 9.07e-13 |
| Te-134 | 1.68e-18 | 1.08e-18 | 1.12e-18 | 1.38e-18 | 1.03e-17 | 0.00e+00 | 6.22e-20 |
| I-129 | 1.39e+09 | 1.17e+09 | 1.96e+09 | 1.43e+12 | 2.10e+09 | 0.00e+00 | 1.37e+08 |
| I-130 | 7.41e+05 | 2.14e+06 | 8.56e+05 | 1.75e+08 | 3.30e+06 | 0.00e+00 | 1.65e+06 |
| I-131 | 5.37e+08 | 7.52e+08 | 4.04e+08 | 2.20e+11 | 1.30e+09 | 0.00e+00 | 1.49e+08 |
| I-132 | 2.96e-01 | 7.75e-01 | 2.78e-01 | 2.61e+01 | 1.22e+00 | 0.00e+00 | 3.38e-01 |
| I-133 | 7.08e+06 | 1.20e+07 | 3.66e+06 | 1.68e+09 | 2.11e+07 | 0.00e+00 | 9.09e+06 |
| I-134 | 3.74e-12 | 9.92e-12 | 3.56e-12 | 1.65e-10 | 1.56e-11 | 0.00e+00 | 1.31e-13 |
| I-135 | 2.29e+04 | 5.90e+04 | 2.19e+04 | 3.80e+06 | 9.33e+04 | 0.00e+00 | 6.54e+04 |
| Cs-134 | 9.81e+09 | 2.31e+10 | 1.07e+10 | 0.00e+00 | 7.34e+09 | 2.80e+09 | 2.87e+08 |
| Cs-134m | 3.13e-01 | 6.49e-01 | 3.34e-01 | 0.00e+00 | 3.61e-01 | 6.34e-02 | 4.32e-01 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Cow's Milk (food) Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Cs-135 | 3.33e+09 | 3.05e+09 | 7.13e+08 | 0.00e+00 | 1.16e+09 | 4.21e+08 | 5.34e+07 |
| Cs-136 | 4.48e+08 | 1.76e+09 | 1.18e+09 | 0.00e+00 | 9.60e+08 | 1.51e+08 | 1.42e+08 |
| Cs-137 | 1.34e+10 | 1.78e+10 | 6.20e+09 | 0.00e+00 | 6.06e+09 | 2.35e+09 | 2.53e+08 |
| Cs-138 | 1.76e-23 | 3.38e-23 | 1.69e-23 | 0.00e+00 | 2.50e-23 | 2.91e-24 | 1.54e-26 |
| Cs-139 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-139 | 8.40e-08 | 5.91e-11 | 2.45e-09 | 0.00e+00 | 5.57e-11 | 4.07e-11 | 7.50e-07 |
| Ba-140 | 4.85e+07 | 5.95e+04 | 3.13e+06 | 0.00e+00 | 2.02e+04 | 4.00e+04 | 7.48e+07 |
| Ba-141 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-142 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| La-140 | 8.11e+00 | 3.99e+00 | 1.06e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.29e+05 |
| La-141 | 5.52e-05 | 1.70e-05 | 2.80e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.01e+00 |
| La-142 | 3.43e-11 | 1.53e-11 | 3.80e-12 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.64e-07 |
| Ce-141 | 8.88e+03 | 5.93e+03 | 6.81e+02 | 0.00e+00 | 2.79e+03 | 0.00e+00 | 1.70e+07 |
| Ce-143 | 7.65e+01 | 5.56e+04 | 6.21e+00 | 0.00e+00 | 2.50e+01 | 0.00e+00 | 1.67e+06 |
| Ce-144 | 6.58e+05 | 2.72e+05 | 3.54e+04 | 0.00e+00 | 1.63e+05 | 0.00e+00 | 1.66e+08 |
| Pr-143 | 2.90e+02 | 1.16e+02 | 1.44e+01 | 0.00e+00 | 6.73e+01 | 0.00e+00 | 9.55e+05 |
| Pr-144 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Nd-147 | 1.81e+02 | 1.97e+02 | 1.18e+01 | 0.00e+00 | 1.16e+02 | 0.00e+00 | 7.11e+05 |
| Pm-147 | 5.15e+03 | 4.89e+02 | 1.99e+02 | 0.00e+00 | 9.32e+02 | 0.00e+00 | 4.65e+05 |
| Pm-148 | 1.09e+02 | 1.77e+01 | 8.93e+00 | 0.00e+00 | 3.20e+01 | 0.00e+00 | 1.06e+06 |
| Pm-148m | 1.49e+03 | 3.78e+02 | 2.96e+02 | 0.00e+00 | 5.73e+02 | 0.00e+00 | 2.38e+06 |
| Pm-149 | 7.88e+00 | 1.11e+00 | 4.54e-01 | 0.00e+00 | 2.11e+00 | 0.00e+00 | 1.63e+05 |
| Pm-151 | 1.18e+00 | 1.95e-01 | 9.88e-02 | 0.00e+00 | 3.51e-01 | 0.00e+00 | 4.38e+04 |
| Sm-151 | 4.35e+03 | 8.37e+02 | 1.96e+02 | 0.00e+00 | 9.17e+02 | 0.00e+00 | 2.84e+05 |
| Sm-153 | 3.65e+00 | 3.02e+00 | 2.22e-01 | 0.00e+00 | 9.88e-01 | 0.00e+00 | 8.53e+04 |
| Eu-152 | 1.22e+04 | 2.93e+03 | 2.58e+03 | 0.00e+00 | 1.36e+04 | 0.00e+00 | 1.08e+06 |
| Eu-154 | 3.94e+04 | 5.08e+03 | 3.58e+03 | 0.00e+00 | 2.27e+04 | 0.00e+00 | 2.69e+06 |
| Eu-155 | 8.48e+03 | 8.18e+02 | 5.07e+02 | 0.00e+00 | 3.20e+03 | 0.00e+00 | 4.69e+06 |
| Eu-156 | 4.55e+02 | 3.41e+02 | 5.57e+01 | 0.00e+00 | 2.30e+02 | 0.00e+00 | 1.74e+06 |
| Tb-160 | 2.65e+03 | 0.00e+00 | 3.31e+02 | 0.00e+00 | 1.05e+03 | 0.00e+00 | 1.72e+06 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Cow's Milk (food) Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ho-166m | 1.78e+04 | 5.48e+03 | 3.97e+03 | 0.00e+00 | 8.03e+03 | 0.00e+00 | 1.35e+06 |
| W-181 | 6.27e+04 | 2.02e+04 | 2.12e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.72e+06 |
| W-185 | 2.39e+06 | 7.88e+05 | 8.33e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.81e+07 |
| W-187 | 1.19e+04 | 9.73e+03 | 3.41e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.63e+06 |
| Pb-210 | 1.12e+11 | 3.36e+10 | 4.33e+09 | 0.00e+00 | 1.06e+11 | 0.00e+00 | 1.46e+07 |
| Bi-210 | 6.57e+05 | 4.49e+06 | 3.76e+05 | 0.00e+00 | 5.46e+07 | 0.00e+00 | 5.13e+07 |
| Po-210 | 1.37e+09 | 2.88e+09 | 3.31e+08 | 0.00e+00 | 9.68e+09 | 0.00e+00 | 1.81e+08 |
| Ra-223 | 2.25e+11 | 3.42e+08 | 4.50e+10 | 0.00e+00 | 9.83e+09 | 0.00e+00 | 1.09e+10 |
| Ra-224 | 2.62e+10 | 6.25e+07 | 5.22e+09 | 0.00e+00 | 1.79e+09 | 0.00e+00 | 4.20e+09 |
| Ra-225 | 3.50e+11 | 4.11e+08 | 6.98e+10 | 0.00e+00 | 1.18e+10 | 0.00e+00 | 1.22e+10 |
| Ra-226 | 2.57e+13 | 6.49e+08 | 1.91e+13 | 0.00e+00 | 1.85e+10 | 0.00e+00 | 2.80e+10 |
| Ra-228 | 1.08e+13 | 3.49e+08 | 1.20e+13 | 0.00e+00 | 9.98e+09 | 0.00e+00 | 4.74e+09 |
| Ac-225 | 1.14e+05 | 1.55e+05 | 7.63e+03 | 0.00e+00 | 1.78e+04 | 0.00e+00 | 7.89e+06 |
| Ac-227 | 1.02e+08 | 1.51e+07 | 6.07e+06 | 0.00e+00 | 4.38e+06 | 0.00e+00 | 4.32e+06 |
| Th-227 | 5.16e+05 | 9.27e+03 | 1.49e+04 | 0.00e+00 | 5.29e+04 | 0.00e+00 | 1.51e+07 |
| Th-228 | 3.32e+07 | 5.56e+05 | 1.12e+06 | 0.00e+00 | 3.13e+06 | 0.00e+00 | 2.91e+07 |
| Th-229 | 7.13e+08 | 2.05e+07 | 1.18e+07 | 0.00e+00 | 9.92e+07 | 0.00e+00 | 4.13e+06 |
| Th-230 | 1.08e+08 | 6.13e+06 | 2.99e+06 | 0.00e+00 | 2.99e+07 | 0.00e+00 | 3.18e+06 |
| Th-232 | 1.21e+08 | 5.24e+06 | 8.13e+04 | 0.00e+00 | 2.55e+07 | 0.00e+00 | 2.71e+06 |
| Th-234 | 3.39e+03 | 1.99e+02 | 9.86e+01 | 0.00e+00 | 1.13e+03 | 0.00e+00 | 3.60e+06 |
| Pa-231 | 2.15e+08 | 8.08e+06 | 8.38e+06 | 0.00e+00 | 4.54e+07 | 0.00e+00 | 3.79e+06 |
| Pa-233 | 2.30e+02 | 4.42e+01 | 3.95e+01 | 0.00e+00 | 1.67e+02 | 0.00e+00 | 5.05e+05 |
| U-232 | 2.94e+10 | 0.00e+00 | 2.10e+09 | 0.00e+00 | 3.18e+09 | 0.00e+00 | 3.58e+08 |
| U-233 | 6.18e+09 | 0.00e+00 | 3.76e+08 | 0.00e+00 | 1.45e+09 | 0.00e+00 | 3.32e+08 |
| U-234 | 5.93e+09 | 0.00e+00 | 3.68e+08 | 0.00e+00 | 1.42e+09 | 0.00e+00 | 3.25e+08 |
| U-235 | 5.68e+09 | 0.00e+00 | 3.46e+08 | 0.00e+00 | 1.33e+09 | 0.00e+00 | 4.13e+08 |
| U-236 | 5.68e+09 | 0.00e+00 | 3.54e+08 | 0.00e+00 | 1.36e+09 | 0.00e+00 | 3.05e+08 |
| U-237 | 1.04e+05 | 0.00e+00 | 2.77e+04 | 0.00e+00 | 4.28e+05 | 0.00e+00 | 2.76e+07 |
| U-238 | 5.43e+09 | 0.00e+00 | 3.24e+08 | 0.00e+00 | 1.25e+09 | 0.00e+00 | 2.91e+08 |
| Np-237 | 6.63e+07 | 4.76e+06 | 2.92e+06 | 0.00e+00 | 2.16e+07 | 0.00e+00 | 4.19e+06 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Teen age group by nuclide.
Waterford Steam Electric Station
Pathway : Cow's Milk (food) Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Np-238 | 6.65e+01 | 1.78e+00 | 1.04e+00 | 0.00e+00 | 6.10e+00 | 0.00e+00 | 1.31e+05 |
| Np-239 | 7.01e+00 | 6.62e-01 | 3.67e-01 | 0.00e+00 | 2.08e+00 | 0.00e+00 | 1.06e+05 |
| Pu-238 | 1.34e+07 | 1.71e+06 | 3.63e+05 | 0.00e+00 | 1.55e+06 | 0.00e+00 | 1.54e+06 |
| Pu-239 | 1.53e+07 | 1.85e+06 | 4.01e+05 | 0.00e+00 | 1.71e+06 | 0.00e+00 | 1.41e+06 |
| Pu-240 | 1.52e+07 | 1.85e+06 | 4.01e+05 | 0.00e+00 | 1.71e+06 | 0.00e+00 | 1.43e+06 |
| Pu-241 | 3.48e+05 | 1.67e+04 | 7.34e+03 | 0.00e+00 | 3.40e+04 | 0.00e+00 | 2.94e+04 |
| Pu-242 | 1.41e+07 | 1.78e+06 | 3.87e+05 | 0.00e+00 | 1.65e+06 | 0.00e+00 | 1.38e+06 |
| Pu-244 | 1.65e+07 | 2.03e+06 | 4.43e+05 | 0.00e+00 | 1.88e+06 | 0.00e+00 | 2.05e+06 |
| Am-241 | 3.94e+07 | 3.72e+07 | 2.84e+06 | 0.00e+00 | 2.13e+07 | 0.00e+00 | 3.89e+06 |
| Am-242m | 4.02e+07 | 3.54e+07 | 2.89e+06 | 0.00e+00 | 2.14e+07 | 0.00e+00 | 4.93e+06 |
| Am-243 | 3.97e+07 | 3.66e+07 | 2.80e+06 | 0.00e+00 | 2.10e+07 | 0.00e+00 | 4.60e+06 |
| Cm-242 | 1.34e+06 | 1.41e+06 | 8.88e+04 | 0.00e+00 | 4.05e+05 | 0.00e+00 | 3.82e+06 |
| Cm-243 | 3.24e+07 | 3.00e+07 | 2.04e+06 | 0.00e+00 | 9.51e+06 | 0.00e+00 | 4.12e+06 |
| Cm-244 | 2.51e+07 | 2.37e+07 | 1.59e+06 | 0.00e+00 | 7.41e+06 | 0.00e+00 | 3.98e+06 |
| Cm-245 | 4.94e+07 | 4.34e+07 | 3.04e+06 | 0.00e+00 | 1.42e+07 | 0.00e+00 | 3.72e+06 |
| Cm-246 | 4.90e+07 | 4.34e+07 | 3.04e+06 | 0.00e+00 | 1.42e+07 | 0.00e+00 | 3.65e+06 |
| Cm-247 | 4.77e+07 | 4.27e+07 | 2.99e+06 | 0.00e+00 | 1.40e+07 | 0.00e+00 | 4.80e+06 |
| Cm-248 | 3.96e+08 | 3.52e+08 | 2.47e+07 | 0.00e+00 | 1.15e+08 | 0.00e+00 | 7.73e+07 |
| Cf-252 | 1.70e+07 | 0.00e+00 | 4.10e+05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.50e+07 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Cow's Milk (food) Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| H-3 | 0.00e+00 | 8.97e+02 | 8.97e+02 | 8.97e+02 | 8.97e+02 | 8.97e+02 | 8.97e+02 |
| Be-10 | 1.11e+07 | 1.29e+06 | 2.79e+05 | 0.00e+00 | 9.13e+05 | 0.00e+00 | 2.26e+07 |
| C-14 | 1.19e+09 | 2.39e+08 | 2.39e+08 | 2.39e+08 | 2.39e+08 | 2.39e+08 | 2.39e+08 |
| N-13 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| F-18 | 1.97e-02 | 0.00e+00 | 1.96e-03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.34e-03 |
| Na-22 | 1.90e+10 | 1.90e+10 | 1.90e+10 | 1.90e+10 | 1.90e+10 | 1.90e+10 | 1.90e+10 |
| Na-24 | 8.88e+06 | 8.88e+06 | 8.88e+06 | 8.88e+06 | 8.88e+06 | 8.88e+06 | 8.88e+06 |
| P-32 | 7.78e+10 | 3.64e+09 | 3.00e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.15e+09 |
| Ca-41 | 2.28e+10 | 0.00e+00 | 2.49e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.25e+07 |
| Sc-46 | 6.83e+02 | 9.36e+02 | 3.61e+02 | 0.00e+00 | 8.29e+02 | 0.00e+00 | 1.37e+06 |
| Cr-51 | 0.00e+00 | 0.00e+00 | 1.02e+05 | 5.65e+04 | 1.54e+04 | 1.03e+05 | 5.40e+06 |
| Mn-54 | 0.00e+00 | 2.10e+07 | 5.59e+06 | 0.00e+00 | 5.88e+06 | 0.00e+00 | 1.76e+07 |
| Mn-56 | 0.00e+00 | 1.28e-02 | 2.90e-03 | 0.00e+00 | 1.55e-02 | 0.00e+00 | 1.86e+00 |
| Fe-55 | 1.12e+08 | 5.93e+07 | 1.84e+07 | 0.00e+00 | 0.00e+00 | 3.35e+07 | 1.10e+07 |
| Fe-59 | 1.20e+08 | 1.95e+08 | 9.69e+07 | 0.00e+00 | 0.00e+00 | 5.64e+07 | 2.03e+08 |
| Co-57 | 0.00e+00 | 3.84e+06 | 7.77e+06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.14e+07 |
| Co-58 | 0.00e+00 | 1.21e+07 | 3.71e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.07e+07 |
| Co-60 | 0.00e+00 | 4.32e+07 | 1.27e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.39e+08 |
| Ni-59 | 2.22e+09 | 5.90e+08 | 3.76e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.91e+07 |
| Ni-63 | 2.96e+10 | 1.59e+09 | 1.01e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.07e+08 |
| Ni-65 | 1.68e+00 | 1.58e-01 | 9.24e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.94e+01 |
| Cu-64 | 0.00e+00 | 7.49e+04 | 4.52e+04 | 0.00e+00 | 1.81e+05 | 0.00e+00 | 3.51e+06 |
| Zn-65 | 4.13e+09 | 1.10e+10 | 6.85e+09 | 0.00e+00 | 6.94e+09 | 0.00e+00 | 1.93e+09 |
| Zn-69 | 9.87e-12 | 1.43e-11 | 1.32e-12 | 0.00e+00 | 8.65e-12 | 0.00e+00 | 8.99e-10 |
| Zn-69m | 8.06e+05 | 1.37e+06 | 1.62e+05 | 0.00e+00 | 7.98e+05 | 0.00e+00 | 4.47e+07 |
| Se-79 | 0.00e+00 | 3.12e+09 | 6.92e+08 | 0.00e+00 | 5.07e+09 | 0.00e+00 | 2.05e+08 |
| Br-82 | 0.00e+00 | 0.00e+00 | 1.15e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-83 | 0.00e+00 | 0.00e+00 | 4.47e-01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-84 | 0.00e+00 | 0.00e+00 | 7.00e-23 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-85 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Cow's Milk (food) Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Rb-86 | 0.00e+00 | 8.77e+09 | 5.39e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.64e+08 |
| Rb-87 | 0.00e+00 | 9.75e+09 | 4.52e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.46e+08 |
| Rb-88 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Rb-89 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sr-89 | 6.62e+09 | 0.00e+00 | 1.89e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.56e+08 |
| Sr-90 | 1.68e+11 | 0.00e+00 | 3.38e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.50e+09 |
| Sr-91 | 1.31e+05 | 0.00e+00 | 4.94e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.89e+05 |
| Sr-92 | 2.21e+00 | 0.00e+00 | 8.88e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.19e+01 |
| Y-90 | 3.22e+02 | 0.00e+00 | 8.63e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 9.18e+05 |
| Y-91 | 3.90e+04 | 0.00e+00 | 1.04e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.20e+06 |
| Y-91m | 2.80e-19 | 0.00e+00 | 1.02e-20 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.49e-16 |
| Y-92 | 2.56e-04 | 0.00e+00 | 7.32e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.39e+00 |
| Y-93 | 1.02e+00 | 0.00e+00 | 2.79e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.51e+04 |
| Zr-93 | 6.87e+03 | 2.57e+02 | 1.83e+02 | 0.00e+00 | 9.95e+02 | 0.00e+00 | 9.75e+04 |
| Zr-95 | 3.83e+03 | 8.42e+02 | 7.50e+02 | 0.00e+00 | 1.21e+03 | 0.00e+00 | 8.79e+05 |
| Zr-97 | 1.92e+00 | 2.78e-01 | 1.64e-01 | 0.00e+00 | 3.99e-01 | 0.00e+00 | 4.21e+04 |
| Nb-93m | 2.15e+06 | 5.37e+05 | 1.77e+05 | 0.00e+00 | 5.80e+05 | 0.00e+00 | 8.10e+07 |
| Nb-95 | 3.18e+05 | 1.24e+05 | 8.84e+04 | 0.00e+00 | 1.16e+05 | 0.00e+00 | 2.29e+08 |
| Nb-97 | 2.91e-11 | 5.26e-12 | 2.46e-12 | 0.00e+00 | 5.84e-12 | 0.00e+00 | 1.62e-06 |
| Mo-93 | 0.00e+00 | 1.49e+09 | 5.34e+07 | 0.00e+00 | 3.92e+08 | 0.00e+00 | 7.53e+07 |
| Mo-99 | 0.00e+00 | 8.14e+07 | 2.01e+07 | 0.00e+00 | 1.74e+08 | 0.00e+00 | 6.73e+07 |
| Tc-101 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Tc-99 | 1.10e+08 | 1.23e+08 | 4.40e+07 | 0.00e+00 | 1.44e+09 | 1.08e+07 | 1.29e+09 |
| Tc-99m | 1.33e+01 | 2.61e+01 | 4.32e+02 | 0.00e+00 | 3.79e+02 | 1.32e+01 | 1.48e+04 |
| Ru-103 | 4.28e+03 | 0.00e+00 | 1.65e+03 | 0.00e+00 | 1.08e+04 | 0.00e+00 | 1.11e+05 |
| Ru-105 | 3.85e-03 | 0.00e+00 | 1.40e-03 | 0.00e+00 | 3.39e-02 | 0.00e+00 | 2.51e+00 |
| Ru-106 | 9.24e+04 | 0.00e+00 | 1.15e+04 | 0.00e+00 | 1.25e+05 | 0.00e+00 | 1.44e+06 |
| Rh-105 | 1.56e+06 | 8.40e+05 | 7.18e+05 | 0.00e+00 | 3.35e+06 | 0.00e+00 | 5.21e+07 |
| Pd-107 | 0.00e+00 | 3.88e+07 | 3.30e+06 | 0.00e+00 | 3.25e+08 | 0.00e+00 | 7.71e+07 |
| Pd-109 | 0.00e+00 | 1.53e+05 | 4.59e+04 | 0.00e+00 | 8.22e+05 | 0.00e+00 | 9.05e+06 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Cow's Milk (food) Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ag-110m | 2.09e+08 | 1.41e+08 | 1.13e+08 | 0.00e+00 | 2.63e+08 | 0.00e+00 | 1.68e+10 |
| Ag-111 | 2.94e+07 | 9.20e+06 | 6.07e+06 | 0.00e+00 | 2.78e+07 | 0.00e+00 | 5.63e+09 |
| Cd-113m | 0.00e+00 | 1.00e+07 | 4.27e+05 | 0.00e+00 | 1.03e+07 | 0.00e+00 | 2.59e+07 |
| Cd-115m | 0.00e+00 | 4.29e+06 | 1.83e+05 | 0.00e+00 | 3.19e+06 | 0.00e+00 | 5.83e+07 |
| Sn-123 | 2.44e+09 | 3.03e+07 | 5.95e+07 | 3.21e+07 | 0.00e+00 | 0.00e+00 | 1.20e+09 |
| Sn-125 | 2.57e+08 | 3.88e+06 | 1.15e+07 | 4.03e+06 | 0.00e+00 | 0.00e+00 | 7.98e+08 |
| Sn-126 | 6.85e+09 | 8.54e+07 | 1.95e+08 | 2.34e+07 | 0.00e+00 | 0.00e+00 | 5.14e+08 |
| Sb-124 | 1.09e+08 | 1.41e+06 | 3.81e+07 | 2.40e+05 | 0.00e+00 | 6.03e+07 | 6.79e+08 |
| Sb-125 | 8.70e+07 | 6.71e+05 | 1.82e+07 | 8.06e+04 | 0.00e+00 | 4.85e+07 | 2.08e+08 |
| Sb-126 | 2.29e+07 | 3.51e+05 | 8.23e+06 | 1.34e+05 | 0.00e+00 | 1.09e+07 | 4.62e+08 |
| Sb-127 | 1.98e+06 | 3.07e+04 | 6.88e+05 | 2.21e+04 | 0.00e+00 | 8.60e+05 | 1.12e+08 |
| Te-125m | 7.38e+07 | 2.00e+07 | 9.84e+06 | 2.07e+07 | 0.00e+00 | 0.00e+00 | 7.12e+07 |
| Te-127 | 2.99e+03 | 8.06e+02 | 6.41e+02 | 2.07e+03 | 8.50e+03 | 0.00e+00 | 1.17e+05 |
| Te-127m | 2.08e+08 | 5.60e+07 | 2.47e+07 | 4.97e+07 | 5.93e+08 | 0.00e+00 | 1.68e+08 |
| Te-129 | 1.33e-09 | 3.70e-10 | 3.15e-10 | 9.46e-10 | 3.88e-09 | 0.00e+00 | 8.25e-08 |
| Te-129m | 2.71e+08 | 7.58e+07 | 4.21e+07 | 8.75e+07 | 7.97e+08 | 0.00e+00 | 3.31e+08 |
| Te-131 | 1.77e-32 | 5.40e-33 | 5.27e-33 | 1.36e-32 | 5.36e-32 | 0.00e+00 | 9.31e-32 |
| Te-131m | 1.60e+06 | 5.54e+05 | 5.89e+05 | 1.14e+06 | 5.36e+06 | 0.00e+00 | 2.25e+07 |
| Te-132 | 1.03e+07 | 4.54e+06 | 5.48e+06 | 6.61e+06 | 4.21e+07 | 0.00e+00 | 4.57e+07 |
| Te-133m | 9.46e-13 | 3.82e-13 | 4.74e-13 | 7.33e-13 | 3.63e-12 | 0.00e+00 | 2.92e-11 |
| Te-134 | 3.99e-18 | 1.79e-18 | 2.39e-18 | 3.15e-18 | 1.66e-17 | 0.00e+00 | 1.82e-17 |
| I-129 | 3.43e+09 | 2.11e+09 | 1.88e+09 | 1.38e+12 | 3.55e+09 | 0.00e+00 | 1.06e+08 |
| I-130 | 1.73e+06 | 3.50e+06 | 1.80e+06 | 3.86e+08 | 5.23e+06 | 0.00e+00 | 1.64e+06 |
| I-131 | 1.30e+09 | 1.31e+09 | 7.45e+08 | 4.33e+11 | 2.15e+09 | 0.00e+00 | 1.17e+08 |
| I-132 | 7.01e-01 | 1.29e+00 | 5.92e-01 | 5.97e+01 | 1.97e+00 | 0.00e+00 | 1.52e+00 |
| I-133 | 1.72e+07 | 2.13e+07 | 8.05e+06 | 3.95e+09 | 3.55e+07 | 0.00e+00 | 8.57e+06 |
| I-134 | 8.87e-12 | 1.65e-11 | 7.57e-12 | 3.79e-10 | 2.52e-11 | 0.00e+00 | 1.09e-11 |
| I-135 | 5.43e+04 | 9.77e+04 | 4.62e+04 | 8.66e+06 | 1.50e+05 | 0.00e+00 | 7.45e+04 |
| Cs-134 | 2.26e+10 | 3.71e+10 | 7.84e+09 | 0.00e+00 | 1.15e+10 | 4.13e+09 | 2.00e+08 |
| Cs-134m | 7.42e-01 | 1.10e+00 | 7.18e-01 | 0.00e+00 | 5.80e-01 | 9.59e-02 | 1.39e+00 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Cow's Milk (food) Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Cs-135 | 8.19e+09 | 5.71e+09 | 5.85e+08 | 0.00e+00 | 2.01e+09 | 6.72e+08 | 4.27e+07 |
| Cs-136 | 1.01e+09 | 2.78e+09 | 1.80e+09 | 0.00e+00 | 1.48e+09 | 2.21e+08 | 9.77e+07 |
| Cs-137 | 3.22e+10 | 3.09e+10 | 4.55e+09 | 0.00e+00 | 1.01e+10 | 3.62e+09 | 1.93e+08 |
| Cs-138 | 4.27e-23 | 5.94e-23 | 3.77e-23 | 0.00e+00 | 4.18e-23 | 4.50e-24 | 2.74e-23 |
| Cs-139 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-139 | 2.06e-07 | 1.10e-10 | 5.98e-09 | 0.00e+00 | 9.62e-11 | 6.48e-11 | 1.19e-05 |
| Ba-140 | 1.17e+08 | 1.03e+05 | 6.84e+06 | 0.00e+00 | 3.34e+04 | 6.12e+04 | 5.93e+07 |
| Ba-141 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-142 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| La-140 | 1.94e+01 | 6.79e+00 | 2.29e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.89e+05 |
| La-141 | 1.36e-04 | 3.17e-05 | 6.89e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.06e+00 |
| La-142 | 8.30e-11 | 2.64e-11 | 8.28e-12 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.24e-06 |
| Ce-141 | 2.19e+04 | 1.09e+04 | 1.62e+03 | 0.00e+00 | 4.78e+03 | 0.00e+00 | 1.36e+07 |
| Ce-143 | 1.88e+02 | 1.02e+05 | 1.47e+01 | 0.00e+00 | 4.27e+01 | 0.00e+00 | 1.49e+06 |
| Ce-144 | 1.62e+06 | 5.09e+05 | 8.66e+04 | 0.00e+00 | 2.82e+05 | 0.00e+00 | 1.33e+08 |
| Pr-143 | 7.18e+02 | 2.16e+02 | 3.56e+01 | 0.00e+00 | 1.17e+02 | 0.00e+00 | 7.75e+05 |
| Pr-144 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Nd-147 | 4.45e+02 | 3.60e+02 | 2.79e+01 | 0.00e+00 | 1.98e+02 | 0.00e+00 | 5.71e+05 |
| Pm-147 | 1.29e+04 | 9.19e+02 | 4.94e+02 | 0.00e+00 | 1.62e+03 | 0.00e+00 | 3.72e+05 |
| Pm-148 | 2.66e+02 | 3.20e+01 | 2.07e+01 | 0.00e+00 | 5.44e+01 | 0.00e+00 | 8.54e+05 |
| Pm-148m | 3.06e+03 | 6.09e+02 | 6.09e+02 | 0.00e+00 | 9.03e+02 | 0.00e+00 | 1.72e+06 |
| Pm-149 | 1.94e+01 | 2.07e+00 | 1.12e+00 | 0.00e+00 | 3.65e+00 | 0.00e+00 | 1.41e+05 |
| Pm-151 | 2.88e+00 | 3.51e-01 | 2.28e-01 | 0.00e+00 | 5.95e-01 | 0.00e+00 | 3.98e+04 |
| Sm-151 | 1.05e+04 | 1.57e+03 | 4.93e+02 | 0.00e+00 | 1.62e+03 | 0.00e+00 | 2.27e+05 |
| Sm-153 | 9.02e+00 | 5.61e+00 | 5.41e-01 | 0.00e+00 | 1.71e+00 | 0.00e+00 | 7.46e+04 |
| Eu-152 | 2.52e+04 | 4.59e+03 | 5.45e+03 | 0.00e+00 | 1.94e+04 | 0.00e+00 | 7.54e+05 |
| Eu-154 | 9.46e+04 | 8.51e+03 | 7.77e+03 | 0.00e+00 | 3.74e+04 | 0.00e+00 | 1.98e+06 |
| Eu-155 | 1.94e+04 | 1.39e+03 | 1.09e+03 | 0.00e+00 | 5.22e+03 | 0.00e+00 | 3.49e+06 |
| Eu-156 | 1.10e+03 | 5.88e+02 | 1.22e+02 | 0.00e+00 | 3.79e+02 | 0.00e+00 | 1.33e+06 |
| Tb-160 | 5.61e+03 | 0.00e+00 | 6.96e+02 | 0.00e+00 | 1.67e+03 | 0.00e+00 | 1.24e+06 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Cow's Milk (food) Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ho-166m | 4.44e+04 | 9.30e+03 | 7.86e+03 | 0.00e+00 | 1.32e+04 | 0.00e+00 | 1.08e+06 |
| W-181 | 1.54e+05 | 3.79e+04 | 5.21e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.38e+06 |
| W-185 | 5.89e+06 | 1.47e+06 | 2.06e+05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.48e+07 |
| W-187 | 2.89e+04 | 1.71e+04 | 7.69e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.41e+06 |
| Pb-210 | 2.42e+11 | 6.21e+10 | 1.06e+10 | 0.00e+00 | 1.87e+11 | 0.00e+00 | 1.17e+07 |
| Bi-210 | 1.62e+06 | 8.38e+06 | 9.29e+05 | 0.00e+00 | 9.45e+07 | 0.00e+00 | 4.25e+07 |
| Po-210 | 3.37e+09 | 5.39e+09 | 8.14e+08 | 0.00e+00 | 1.68e+10 | 0.00e+00 | 1.45e+08 |
| Ra-223 | 5.55e+11 | 6.41e+08 | 1.11e+11 | 0.00e+00 | 1.70e+10 | 0.00e+00 | 8.84e+09 |
| Ra-224 | 6.43e+10 | 1.17e+08 | 1.29e+10 | 0.00e+00 | 3.09e+09 | 0.00e+00 | 3.53e+09 |
| Ra-225 | 8.62e+11 | 7.70e+08 | 1.72e+11 | 0.00e+00 | 2.04e+10 | 0.00e+00 | 9.89e+09 |
| Ra-226 | 3.78e+13 | 1.21e+09 | 3.11e+13 | 0.00e+00 | 3.21e+10 | 0.00e+00 | 2.24e+10 |
| Ra-228 | 2.52e+13 | 6.53e+08 | 2.82e+13 | 0.00e+00 | 1.73e+10 | 0.00e+00 | 3.80e+09 |
| Ac-225 | 2.81e+05 | 2.89e+05 | 1.88e+04 | 0.00e+00 | 3.09e+04 | 0.00e+00 | 6.43e+06 |
| Ac-227 | 1.69e+08 | 2.72e+07 | 1.05e+07 | 0.00e+00 | 5.99e+06 | 0.00e+00 | 3.46e+06 |
| Th-227 | 1.27e+06 | 1.73e+04 | 3.67e+04 | 0.00e+00 | 9.17e+04 | 0.00e+00 | 1.22e+07 |
| Th-228 | 8.33e+07 | 1.07e+06 | 2.82e+06 | 0.00e+00 | 5.55e+06 | 0.00e+00 | 2.33e+07 |
| Th-229 | 9.67e+08 | 2.43e+07 | 1.61e+07 | 0.00e+00 | 1.19e+08 | 0.00e+00 | 3.31e+06 |
| Th-230 | 1.46e+08 | 7.32e+06 | 4.08e+06 | 0.00e+00 | 3.57e+07 | 0.00e+00 | 2.55e+06 |
| Th-232 | 1.63e+08 | 6.25e+06 | 1.24e+05 | 0.00e+00 | 3.05e+07 | 0.00e+00 | 2.17e+06 |
| Th-234 | 8.40e+03 | 3.71e+02 | 2.43e+02 | 0.00e+00 | 1.97e+03 | 0.00e+00 | 2.90e+06 |
| Pa-231 | 2.91e+08 | 9.63e+06 | 1.16e+07 | 0.00e+00 | 5.27e+07 | 0.00e+00 | 3.03e+06 |
| Pa-233 | 4.68e+02 | 7.30e+01 | 8.18e+01 | 0.00e+00 | 2.69e+02 | 0.00e+00 | 3.73e+05 |
| U-232 | 7.24e+10 | 0.00e+00 | 5.18e+09 | 0.00e+00 | 5.51e+09 | 0.00e+00 | 2.87e+08 |
| U-233 | 1.53e+10 | 0.00e+00 | 9.26e+08 | 0.00e+00 | 2.51e+09 | 0.00e+00 | 2.65e+08 |
| U-234 | 1.47e+10 | 0.00e+00 | 9.09e+08 | 0.00e+00 | 2.46e+09 | 0.00e+00 | 2.60e+08 |
| U-235 | 1.41e+10 | 0.00e+00 | 8.51e+08 | 0.00e+00 | 2.31e+09 | 0.00e+00 | 3.30e+08 |
| U-236 | 1.41e+10 | 0.00e+00 | 8.72e+08 | 0.00e+00 | 2.36e+09 | 0.00e+00 | 2.44e+08 |
| U-237 | 2.57e+05 | 0.00e+00 | 6.83e+04 | 0.00e+00 | 7.42e+05 | 0.00e+00 | 2.27e+07 |
| U-238 | 1.35e+10 | 0.00e+00 | 7.98e+08 | 0.00e+00 | 2.16e+09 | 0.00e+00 | 2.33e+08 |
| Np-237 | 9.17e+07 | 6.05e+06 | 4.03e+06 | 0.00e+00 | 2.49e+07 | 0.00e+00 | 3.36e+06 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Child age group by nuclide.
Waterford Steam Electric Station
Pathway : Cow's Milk (food) Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Np-238 | 1.64e+02 | 3.32e+00 | 2.55e+00 | 0.00e+00 | 1.06e+01 | 0.00e+00 | 1.14e+05 |
| Np-239 | 1.73e+01 | 1.24e+00 | 8.71e-01 | 0.00e+00 | 3.58e+00 | 0.00e+00 | 9.17e+04 |
| Pu-238 | 1.96e+07 | 2.27e+06 | 5.20e+05 | 0.00e+00 | 1.89e+06 | 0.00e+00 | 1.23e+06 |
| Pu-239 | 2.12e+07 | 2.27e+06 | 5.45e+05 | 0.00e+00 | 2.01e+06 | 0.00e+00 | 1.13e+06 |
| Pu-240 | 2.11e+07 | 2.35e+06 | 5.45e+05 | 0.00e+00 | 2.01e+06 | 0.00e+00 | 1.15e+06 |
| Pu-241 | 6.35e+05 | 2.59e+04 | 1.32e+04 | 0.00e+00 | 4.86e+04 | 0.00e+00 | 2.36e+04 |
| Pu-242 | 1.96e+07 | 2.27e+06 | 5.25e+05 | 0.00e+00 | 1.93e+06 | 0.00e+00 | 1.10e+06 |
| Pu-244 | 2.29e+07 | 2.60e+07 | 6.01e+05 | 0.00e+00 | 2.22e+06 | 0.00e+00 | 1.65e+06 |
| Am-241 | 5.54e+07 | 4.77e+07 | 4.16e+06 | 0.00e+00 | 2.54e+07 | 0.00e+00 | 3.11e+06 |
| Am-242m | 5.76e+07 | 4.61e+07 | 4.28e+06 | 0.00e+00 | 2.59e+07 | 0.00e+00 | 3.95e+06 |
| Am-243 | 5.51e+07 | 4.65e+07 | 4.04e+06 | 0.00e+00 | 2.49e+07 | 0.00e+00 | 3.68e+06 |
| Cm-242 | 3.30e+06 | 2.63e+06 | 2.19e+05 | 0.00e+00 | 7.02e+05 | 0.00e+00 | 3.06e+06 |
| Cm-243 | 5.26e+07 | 4.27e+07 | 3.38e+06 | 0.00e+00 | 1.27e+07 | 0.00e+00 | 3.30e+06 |
| Cm-244 | 4.43e+07 | 3.59e+07 | 2.84e+06 | 0.00e+00 | 1.04e+07 | 0.00e+00 | 3.19e+06 |
| Cm-245 | 6.87e+07 | 5.51e+07 | 4.32e+06 | 0.00e+00 | 1.69e+07 | 0.00e+00 | 2.98e+06 |
| Cm-246 | 6.79e+07 | 5.51e+07 | 4.32e+06 | 0.00e+00 | 1.69e+07 | 0.00e+00 | 2.92e+06 |
| Cm-247 | 6.62e+07 | 5.43e+07 | 4.24e+06 | 0.00e+00 | 1.66e+07 | 0.00e+00 | 3.85e+06 |
| Cm-248 | 5.51e+08 | 4.48e+08 | 3.50e+07 | 0.00e+00 | 1.37e+08 | 0.00e+00 | 6.21e+07 |
| Cf-252 | 4.25e+07 | 0.00e+00 | 1.03e+06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.20e+07 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Cow's Milk (food) Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| H-3 | 0.00e+00 | 1.36e+03 | 1.36e+03 | 1.36e+03 | 1.36e+03 | 1.36e+03 | 1.36e+03 |
| Be-10 | 1.41e+07 | 2.05e+06 | 4.25e+05 | 0.00e+00 | 1.35e+06 | 0.00e+00 | 2.29e+07 |
| C-14 | 2.34e+09 | 5.00e+08 | 5.00e+08 | 5.00e+08 | 5.00e+08 | 5.00e+08 | 5.00e+08 |
| N-13 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| F-18 | 4.12e-02 | 0.00e+00 | 3.51e-03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 9.67e-03 |
| Na-22 | 3.18e+10 | 3.18e+10 | 3.18e+10 | 3.18e+10 | 3.18e+10 | 3.18e+10 | 3.18e+10 |
| Na-24 | 1.55e+07 | 1.55e+07 | 1.55e+07 | 1.55e+07 | 1.55e+07 | 1.55e+07 | 1.55e+07 |
| P-32 | 1.60e+11 | 9.43e+09 | 6.21e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.17e+09 |
| Ca-41 | 2.46e+10 | 0.00e+00 | 2.69e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.26e+07 |
| Sc-46 | 1.30e+03 | 1.88e+03 | 5.86e+02 | 0.00e+00 | 1.23e+03 | 0.00e+00 | 1.22e+06 |
| Cr-51 | 0.00e+00 | 0.00e+00 | 1.61e+05 | 1.05e+05 | 2.30e+04 | 2.05e+05 | 4.70e+06 |
| Mn-54 | 0.00e+00 | 3.90e+07 | 8.84e+06 | 0.00e+00 | 8.64e+06 | 0.00e+00 | 1.43e+07 |
| Mn-56 | 0.00e+00 | 3.14e-02 | 5.42e-03 | 0.00e+00 | 2.70e-02 | 0.00e+00 | 2.86e+00 |
| Fe-55 | 1.35e+08 | 8.73e+07 | 2.33e+07 | 0.00e+00 | 0.00e+00 | 4.27e+07 | 1.11e+07 |
| Fe-59 | 2.24e+08 | 3.92e+08 | 1.54e+08 | 0.00e+00 | 0.00e+00 | 1.16e+08 | 1.87e+08 |
| Co-57 | 0.00e+00 | 8.95e+06 | 1.46e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.05e+07 |
| Co-58 | 0.00e+00 | 2.42e+07 | 6.05e+07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.04e+07 |
| Co-60 | 0.00e+00 | 8.81e+07 | 2.08e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.10e+08 |
| Ni-59 | 2.61e+09 | 7.99e+08 | 4.50e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.95e+07 |
| Ni-63 | 3.49e+10 | 2.16e+09 | 1.21e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.07e+08 |
| Ni-65 | 3.56e+00 | 4.03e-01 | 1.83e-01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.07e+01 |
| Cu-64 | 0.00e+00 | 1.86e+05 | 8.62e+04 | 0.00e+00 | 3.15e+05 | 0.00e+00 | 3.82e+06 |
| Zn-65 | 5.55e+09 | 1.90e+10 | 8.78e+09 | 0.00e+00 | 9.23e+09 | 0.00e+00 | 1.61e+10 |
| Zn-69 | 2.10e-11 | 3.79e-11 | 2.82e-12 | 0.00e+00 | 1.57e-11 | 0.00e+00 | 3.09e-09 |
| Zn-69m | 1.70e+06 | 3.48e+06 | 3.17e+05 | 0.00e+00 | 1.41e+06 | 0.00e+00 | 4.82e+07 |
| Se-79 | 0.00e+00 | 7.77e+09 | 1.44e+09 | 0.00e+00 | 9.00e+09 | 0.00e+00 | 2.07e+08 |
| Br-82 | 0.00e+00 | 0.00e+00 | 1.93e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-83 | 0.00e+00 | 0.00e+00 | 9.49e-01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-84 | 0.00e+00 | 0.00e+00 | 1.35e-22 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-85 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Cow's Milk (food) Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Rb-86 | 0.00e+00 | 2.23e+10 | 1.10e+10 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.69e+08 |
| Rb-87 | 0.00e+00 | 2.19e+10 | 8.69e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.48e+08 |
| Rb-88 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Rb-89 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Sr-89 | 1.26e+10 | 0.00e+00 | 3.61e+08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.59e+08 |
| Sr-90 | 1.86e+11 | 0.00e+00 | 3.77e+09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.52e+09 |
| Sr-91 | 2.73e+05 | 0.00e+00 | 9.87e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.23e+05 |
| Sr-92 | 4.71e+00 | 0.00e+00 | 1.75e-01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.08e+01 |
| Y-90 | 6.82e+02 | 0.00e+00 | 1.83e+01 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 9.41e+05 |
| Y-91 | 7.33e+04 | 0.00e+00 | 1.95e+03 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.25e+06 |
| Y-91m | 5.94e-19 | 0.00e+00 | 2.03e-20 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.98e-15 |
| Y-92 | 5.44e-04 | 0.00e+00 | 1.53e-05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.04e+01 |
| Y-93 | 2.16e+00 | 0.00e+00 | 5.90e-02 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.71e+04 |
| Zr-93 | 7.94e+03 | 3.78e+02 | 2.28e+02 | 0.00e+00 | 1.11e+03 | 0.00e+00 | 9.83e+04 |
| Zr-95 | 6.80e+03 | 1.66e+03 | 1.18e+03 | 0.00e+00 | 1.79e+03 | 0.00e+00 | 8.26e+05 |
| Zr-97 | 4.07e+00 | 6.99e-01 | 3.19e-01 | 0.00e+00 | 7.04e-01 | 0.00e+00 | 4.46e+04 |
| Nb-93m | 2.52e+06 | 6.83e+05 | 2.13e+05 | 0.00e+00 | 6.66e+05 | 0.00e+00 | 8.16e+07 |
| Nb-95 | 5.93e+05 | 2.44e+05 | 1.41e+05 | 0.00e+00 | 1.75e+05 | 0.00e+00 | 2.06e+08 |
| Nb-97 | 6.16e-11 | 1.31e-11 | 4.74e-12 | 0.00e+00 | 1.03e-11 | 0.00e+00 | 4.15e-06 |
| Mo-93 | 0.00e+00 | 3.49e+09 | 1.12e+08 | 0.00e+00 | 6.97e+08 | 0.00e+00 | 7.47e+07 |
| Mo-99 | 0.00e+00 | 2.08e+08 | 4.06e+07 | 0.00e+00 | 3.11e+08 | 0.00e+00 | 6.86e+07 |
| Tc-101 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Tc-99 | 2.22e+08 | 3.00e+08 | 9.36e+07 | 0.00e+00 | 2.53e+09 | 2.92e+07 | 1.30e+09 |
| Tc-99m | 2.77e+01 | 5.70e+01 | 7.35e+02 | 0.00e+00 | 6.14e+02 | 2.98e+01 | 1.66e+04 |
| Ru-103 | 8.67e+03 | 0.00e+00 | 2.90e+03 | 0.00e+00 | 1.80e+04 | 0.00e+00 | 1.05e+05 |
| Ru-105 | 8.12e-03 | 0.00e+00 | 2.74e-03 | 0.00e+00 | 5.97e-02 | 0.00e+00 | 3.23e+00 |
| Ru-106 | 1.90e+05 | 0.00e+00 | 2.38e+04 | 0.00e+00 | 2.25e+05 | 0.00e+00 | 1.44e+06 |
| Rh-105 | 3.32e+06 | 2.17e+06 | 1.46e+06 | 0.00e+00 | 6.03e+06 | 0.00e+00 | 5.39e+07 |
| Pd-107 | 0.00e+00 | 9.79e+07 | 6.95e+06 | 0.00e+00 | 5.59e+08 | 0.00e+00 | 7.78e+07 |
| Pd-109 | 0.00e+00 | 4.05e+05 | 9.78e+04 | 0.00e+00 | 1.49e+06 | 0.00e+00 | 9.95e+06 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Cow's Milk (food) Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ag-110m | 3.86e+08 | 2.82e+08 | 1.86e+08 | 0.00e+00 | 4.03e+08 | 0.00e+00 | 1.46e+10 |
| Ag-111 | 6.17e+07 | 2.40e+07 | 1.27e+07 | 0.00e+00 | 5.01e+07 | 0.00e+00 | 5.72e+09 |
| Cd-113m | 0.00e+00 | 1.74e+07 | 6.42e+05 | 0.00e+00 | 1.32e+07 | 0.00e+00 | 2.62e+07 |
| Cd-115m | 0.00e+00 | 1.03e+07 | 3.59e+05 | 0.00e+00 | 5.40e+06 | 0.00e+00 | 5.89e+07 |
| Sn-123 | 4.57e+09 | 7.14e+07 | 1.19e+08 | 7.18e+07 | 0.00e+00 | 0.00e+00 | 1.21e+09 |
| Sn-125 | 5.37e+08 | 1.00e+07 | 2.39e+07 | 9.86e+06 | 0.00e+00 | 0.00e+00 | 8.05e+08 |
| Sn-126 | 1.14e+10 | 1.49e+08 | 3.70e+08 | 3.93e+07 | 0.00e+00 | 0.00e+00 | 5.18e+08 |
| Sb-124 | 2.09e+08 | 3.08e+06 | 6.49e+07 | 5.56e+05 | 0.00e+00 | 1.31e+08 | 6.46e+08 |
| Sb-125 | 1.50e+08 | 1.45e+06 | 3.08e+07 | 1.87e+05 | 0.00e+00 | 8.65e+07 | 1.99e+08 |
| Sb-126 | 4.20e+07 | 8.23e+05 | 1.52e+07 | 3.22e+05 | 0.00e+00 | 2.64e+07 | 4.35e+08 |
| Sb-127 | 4.17e+06 | 7.44e+04 | 1.29e+06 | 5.31e+04 | 0.00e+00 | 2.15e+06 | 1.11e+08 |
| Te-125m | 1.51e+08 | 5.04e+07 | 2.04e+07 | 5.07e+07 | 0.00e+00 | 0.00e+00 | 7.18e+07 |
| Te-127 | 6.34e+03 | 2.13e+03 | 1.36e+03 | 5.16e+03 | 1.55e+04 | 0.00e+00 | 1.33e+05 |
| Te-127m | 4.21e+08 | 1.40e+08 | 5.10e+07 | 1.22e+08 | 1.04e+09 | 0.00e+00 | 1.70e+08 |
| Te-129 | 2.81e-09 | 9.69e-10 | 6.56e-10 | 2.36e-09 | 7.00e-09 | 0.00e+00 | 2.25e-07 |
| Te-129m | 5.57e+08 | 1.91e+08 | 8.58e+07 | 2.14e+08 | 1.39e+09 | 0.00e+00 | 3.33e+08 |
| Te-131 | 3.76e-32 | 1.39e-32 | 1.05e-32 | 3.35e-32 | 9.61e-32 | 0.00e+00 | 1.52e-30 |
| Te-131m | 3.38e+06 | 1.36e+06 | 1.12e+06 | 2.76e+06 | 9.36e+06 | 0.00e+00 | 2.29e+07 |
| Te-132 | 2.11e+07 | 1.05e+07 | 9.75e+06 | 1.54e+07 | 6.54e+07 | 0.00e+00 | 3.87e+07 |
| Te-133m | 1.98e-12 | 9.05e-13 | 8.65e-13 | 1.74e-12 | 6.17e-12 | 0.00e+00 | 9.76e-11 |
| Te-134 | 8.25e-18 | 4.14e-18 | 4.27e-18 | 7.39e-18 | 2.79e-17 | 0.00e+00 | 9.46e-17 |
| I-129 | 7.06e+09 | 5.23e+09 | 3.83e+09 | 3.36e+12 | 6.19e+09 | 0.00e+00 | 1.05e+08 |
| I-130 | 3.56e+06 | 7.83e+06 | 3.14e+06 | 8.78e+08 | 8.60e+06 | 0.00e+00 | 1.68e+06 |
| I-131 | 2.72e+09 | 3.21e+09 | 1.41e+09 | 1.05e+12 | 3.74e+09 | 0.00e+00 | 1.14e+08 |
| I-132 | 1.45e+00 | 2.95e+00 | 1.05e+00 | 1.38e+02 | 3.29e+00 | 0.00e+00 | 2.39e+00 |
| I-133 | 3.63e+07 | 5.29e+07 | 1.55e+07 | 9.62e+09 | 6.22e+07 | 0.00e+00 | 8.95e+06 |
| I-134 | 1.84e-11 | 3.77e-11 | 1.34e-11 | 8.78e-10 | 4.21e-11 | 0.00e+00 | 3.89e-11 |
| I-135 | 1.13e+05 | 2.25e+05 | 8.19e+04 | 2.01e+07 | 2.50e+05 | 0.00e+00 | 8.13e+04 |
| Cs-134 | 3.65e+10 | 6.80e+10 | 6.87e+09 | 0.00e+00 | 1.75e+10 | 7.18e+09 | 1.85e+08 |
| Cs-134m | 1.55e+00 | 2.58e+00 | 1.30e+00 | 0.00e+00 | 9.94e-01 | 2.29e-01 | 2.04e+00 |

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# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Cow's Milk (food) Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Cs-135 | 1.31e+10 | 1.19e+10 | 6.22e+08 | 0.00e+00 | 3.40e+09 | 1.29e+09 | 4.31e+07 |
| Cs-136 | 1.98e+09 | 5.81e+09 | 2.17e+09 | 0.00e+00 | 2.32e+09 | 4.74e+08 | 8.83e+07 |
| Cs-137 | 5.15e+10 | 6.02e+10 | 4.27e+09 | 0.00e+00 | 1.62e+10 | 6.55e+09 | 1.88e+08 |
| Cs-138 | 9.01e-23 | 1.47e-22 | 7.10e-23 | 0.00e+00 | 7.31e-23 | 1.14e-23 | 2.34e-22 |
| Cs-139 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-139 | 4.39e-07 | 2.91e-10 | 1.27e-08 | 0.00e+00 | 1.75e-10 | 1.77e-10 | 2.78e-05 |
| Ba-140 | 2.41e+08 | 2.41e+05 | 1.24e+07 | 0.00e+00 | 5.72e+04 | 1.48e+05 | 5.92e+07 |
| Ba-141 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Ba-142 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| La-140 | 4.06e+01 | 1.60e+01 | 4.11e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.88e+05 |
| La-141 | 2.89e-04 | 8.39e-05 | 1.46e-05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 9.62e+00 |
| La-142 | 1.74e-10 | 6.40e-11 | 1.53e-11 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.09e-05 |
| Ce-141 | 4.34e+04 | 2.64e+04 | 3.11e+03 | 0.00e+00 | 8.15e+03 | 0.00e+00 | 1.37e+07 |
| Ce-143 | 3.97e+02 | 2.64e+05 | 3.01e+01 | 0.00e+00 | 7.68e+01 | 0.00e+00 | 1.54e+06 |
| Ce-144 | 2.33e+06 | 9.52e+05 | 1.30e+05 | 0.00e+00 | 3.85e+05 | 0.00e+00 | 1.33e+08 |
| Pr-143 | 1.49e+03 | 5.55e+02 | 7.36e+01 | 0.00e+00 | 2.06e+02 | 0.00e+00 | 7.84e+05 |
| Pr-144 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Nd-147 | 8.81e+02 | 9.05e+02 | 5.55e+01 | 0.00e+00 | 3.49e+02 | 0.00e+00 | 5.74e+05 |
| Pm-147 | 1.57e+04 | 1.32e+03 | 6.44e+02 | 0.00e+00 | 1.98e+03 | 0.00e+00 | 3.75e+05 |
| Pm-148 | 5.57e+02 | 8.04e+01 | 4.05e+01 | 0.00e+00 | 9.60e+01 | 0.00e+00 | 8.58e+05 |
| Pm-148m | 4.90e+03 | 1.24e+03 | 9.74e+02 | 0.00e+00 | 1.43e+03 | 0.00e+00 | 1.62e+06 |
| Pm-149 | 4.13e+01 | 5.42e+00 | 2.37e+00 | 0.00e+00 | 6.59e+00 | 0.00e+00 | 1.46e+05 |
| Pm-151 | 6.10e+00 | 8.90e-01 | 4.50e-01 | 0.00e+00 | 1.06e+00 | 0.00e+00 | 4.12e+04 |
| Sm-151 | 1.19e+04 | 2.74e+03 | 5.92e+02 | 0.00e+00 | 1.86e+03 | 0.00e+00 | 2.29e+05 |
| Sm-153 | 1.91e+01 | 1.47e+01 | 1.13e+00 | 0.00e+00 | 3.09e+00 | 0.00e+00 | 7.71e+04 |
| Eu-152 | 2.76e+04 | 7.34e+03 | 6.19e+03 | 0.00e+00 | 2.06e+04 | 0.00e+00 | 6.52e+05 |
| Eu-154 | 1.09e+05 | 1.51e+04 | 9.05e+03 | 0.00e+00 | 4.09e+04 | 0.00e+00 | 1.88e+06 |
| Eu-155 | 2.18e+04 | 2.51e+03 | 1.30e+03 | 0.00e+00 | 5.63e+03 | 0.00e+00 | 3.36e+06 |
| Eu-156 | 2.23e+03 | 1.38e+03 | 2.19e+02 | 0.00e+00 | 6.37e+02 | 0.00e+00 | 1.30e+06 |
| Tb-160 | 8.75e+03 | 0.00e+00 | 1.09e+03 | 0.00e+00 | 2.49e+03 | 0.00e+00 | 1.17e+06 |

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# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Cow's Milk (food) Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ho-166m | 5.14e+04 | 1.11e+04 | 8.76e+03 | 0.00e+00 | 1.47e+04 | 0.00e+00 | 1.09e+06 |
| W-181 | 3.23e+05 | 9.91e+04 | 1.11e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.39e+06 |
| W-185 | 1.23e+07 | 3.85e+06 | 4.39e+05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.51e+07 |
| W-187 | 6.09e+04 | 4.23e+04 | 1.46e+04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.49e+06 |
| Pb-210 | 2.69e+11 | 7.23e+10 | 1.21e+10 | 0.00e+00 | 2.20e+11 | 0.00e+00 | 1.18e+07 |
| Bi-210 | 3.42e+06 | 2.20e+07 | 1.96e+06 | 0.00e+00 | 1.71e+08 | 0.00e+00 | 4.33e+07 |
| Po-210 | 6.88e+09 | 1.32e+10 | 1.64e+09 | 0.00e+00 | 2.80e+10 | 0.00e+00 | 1.47e+08 |
| Ra-223 | 1.15e+12 | 1.68e+09 | 2.31e+11 | 0.00e+00 | 3.06e+10 | 0.00e+00 | 8.97e+09 |
| Ra-224 | 1.36e+11 | 3.07e+08 | 2.72e+10 | 0.00e+00 | 5.60e+09 | 0.00e+00 | 3.60e+09 |
| Ra-225 | 1.78e+12 | 2.01e+09 | 3.54e+11 | 0.00e+00 | 3.66e+10 | 0.00e+00 | 9.98e+09 |
| Ra-226 | 4.08e+13 | 3.13e+09 | 3.38e+13 | 0.00e+00 | 5.73e+10 | 0.00e+00 | 2.26e+10 |
| Ra-228 | 2.82e+13 | 1.69e+09 | 3.18e+13 | 0.00e+00 | 3.09e+10 | 0.00e+00 | 3.83e+09 |
| Ac-225 | 5.85e+05 | 7.51e+05 | 3.92e+04 | 0.00e+00 | 5.51e+04 | 0.00e+00 | 6.51e+06 |
| Ac-227 | 1.84e+08 | 3.15e+07 | 1.15e+07 | 0.00e+00 | 6.40e+06 | 0.00e+00 | 3.49e+06 |
| Th-227 | 2.61e+06 | 4.37e+04 | 7.49e+04 | 0.00e+00 | 1.61e+05 | 0.00e+00 | 1.24e+07 |
| Th-228 | 9.94e+07 | 1.36e+06 | 3.36e+06 | 0.00e+00 | 6.36e+06 | 0.00e+00 | 2.35e+07 |
| Th-229 | 1.04e+09 | 2.60e+07 | 1.73e+07 | 0.00e+00 | 1.25e+08 | 0.00e+00 | 3.33e+06 |
| Th-230 | 1.56e+08 | 7.82e+06 | 4.36e+06 | 0.00e+00 | 3.75e+07 | 0.00e+00 | 2.57e+06 |
| Th-232 | 1.74e+08 | 6.70e+06 | 6.79e+04 | 0.00e+00 | 3.20e+07 | 0.00e+00 | 2.18e+06 |
| Th-234 | 1.70e+04 | 9.26e+02 | 4.91e+02 | 0.00e+00 | 3.41e+03 | 0.00e+00 | 2.92e+06 |
| Pa-231 | 3.11e+08 | 1.03e+07 | 1.24e+07 | 0.00e+00 | 5.51e+07 | 0.00e+00 | 3.06e+06 |
| Pa-233 | 8.05e+02 | 1.58e+02 | 1.41e+02 | 0.00e+00 | 4.32e+02 | 0.00e+00 | 3.78e+05 |
| U-232 | 9.95e+10 | 0.00e+00 | 8.88e+09 | 0.00e+00 | 9.74e+09 | 0.00e+00 | 2.89e+08 |
| U-233 | 2.09e+10 | 0.00e+00 | 1.59e+09 | 0.00e+00 | 4.44e+09 | 0.00e+00 | 2.68e+08 |
| U-234 | 2.01e+10 | 0.00e+00 | 1.56e+09 | 0.00e+00 | 4.36e+09 | 0.00e+00 | 2.62e+08 |
| U-235 | 1.92e+10 | 0.00e+00 | 1.46e+09 | 0.00e+00 | 4.08e+09 | 0.00e+00 | 3.33e+08 |
| U-236 | 1.92e+10 | 0.00e+00 | 1.50e+09 | 0.00e+00 | 4.15e+09 | 0.00e+00 | 2.46e+08 |
| U-237 | 5.39e+05 | 0.00e+00 | 1.44e+05 | 0.00e+00 | 1.34e+06 | 0.00e+00 | 2.30e+07 |
| U-238 | 1.84e+10 | 0.00e+00 | 1.37e+09 | 0.00e+00 | 3.82e+09 | 0.00e+00 | 2.35e+08 |
| Np-237 | 9.87e+07 | 6.54e+06 | 4.32e+06 | 0.00e+00 | 2.61e+07 | 0.00e+00 | 3.39e+06 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for Infant age group by nuclide.
Waterford Steam Electric Station
Pathway : Cow's Milk (food) Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Np-238 | 3.49e+02 | 8.78e+00 | 5.40e+00 | 0.00e+00 | 1.92e+01 | 0.00e+00 | 1.17e+05 |
| Np-239 | 3.65e+01 | 3.26e+00 | 1.84e+00 | 0.00e+00 | 6.51e+00 | 0.00e+00 | 9.44e+04 |
| Pu-238 | 2.11e+07 | 2.47e+06 | 5.59e+05 | 0.00e+00 | 1.99e+06 | 0.00e+00 | 1.24e+06 |
| Pu-239 | 2.27e+07 | 2.55e+06 | 5.82e+05 | 0.00e+00 | 2.11e+06 | 0.00e+00 | 1.14e+06 |
| Pu-240 | 2.27e+07 | 2.55e+06 | 5.82e+05 | 0.00e+00 | 2.11e+06 | 0.00e+00 | 1.16e+06 |
| Pu-241 | 6.97e+05 | 2.89e+04 | 1.45e+04 | 0.00e+00 | 5.20e+04 | 0.00e+00 | 2.38e+04 |
| Pu-242 | 2.11e+07 | 2.45e+06 | 5.61e+05 | 0.00e+00 | 2.02e+06 | 0.00e+00 | 1.11e+06 |
| Pu-244 | 2.45e+07 | 2.81e+06 | 6.43e+05 | 0.00e+00 | 2.32e+06 | 0.00e+00 | 1.66e+06 |
| Am-241 | 5.95e+07 | 5.17e+07 | 4.44e+06 | 0.00e+00 | 2.67e+07 | 0.00e+00 | 3.14e+06 |
| Am-242m | 6.21e+07 | 5.02e+07 | 4.65e+06 | 0.00e+00 | 2.73e+07 | 0.00e+00 | 3.98e+06 |
| Am-243 | 5.92e+07 | 5.06e+07 | 4.36e+06 | 0.00e+00 | 2.62e+07 | 0.00e+00 | 3.71e+06 |
| Cm-242 | 5.15e+06 | 4.77e+06 | 3.42e+05 | 0.00e+00 | 9.84e+05 | 0.00e+00 | 3.09e+06 |
| Cm-243 | 5.75e+07 | 4.72e+07 | 3.69e+06 | 0.00e+00 | 1.34e+07 | 0.00e+00 | 3.33e+06 |
| Cm-244 | 4.84e+07 | 3.98e+07 | 3.11e+06 | 0.00e+00 | 1.11e+07 | 0.00e+00 | 3.22e+06 |
| Cm-245 | 7.36e+07 | 5.96e+07 | 4.65e+06 | 0.00e+00 | 1.78e+07 | 0.00e+00 | 3.00e+06 |
| Cm-246 | 7.28e+07 | 5.96e+07 | 4.65e+06 | 0.00e+00 | 1.77e+07 | 0.00e+00 | 2.95e+06 |
| Cm-247 | 7.12e+07 | 5.88e+07 | 4.57e+06 | 0.00e+00 | 1.74e+07 | 0.00e+00 | 3.88e+06 |
| Cm-248 | 5.88e+08 | 4.85e+08 | 3.77e+07 | 0.00e+00 | 1.44e+08 | 0.00e+00 | 6.25e+07 |
| Cf-252 | 4.93e+07 | 0.00e+00 | 1.19e+06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.21e+07 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for all age groups by nuclide.
Waterford Steam Electric Station
Pathway : Ground Plane Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | |
|---|---|---|
| | T. Body | Skin |
| H-3 | 0.00e+00 | 0.00e+00 |
| Be-10 | 0.00e+00 | 0.00e+00 |
| C-14 | 0.00e+00 | 0.00e+00 |
| N-13 | 5.75e+04 | 6.65e+04 |
| F-18 | 5.66e+05 | 6.66e+05 |
| Na-22 | 3.88e+09 | 4.36e+09 |
| Na-24 | 1.71e+07 | 1.98e+07 |
| P-32 | 0.00e+00 | 0.00e+00 |
| Ca-41 | 9.42e+08 | 1.11e+09 |
| Sc-46 | 1.13e+09 | 1.31e+09 |
| Cr-51 | 6.65e+06 | 7.86e+06 |
| Mn-54 | 1.10e+09 | 1.29e+09 |
| Mn-56 | 1.29e+06 | 1.52e+06 |
| Fe-55 | 0.00e+00 | 0.00e+00 |
| Fe-59 | 3.89e+08 | 4.57e+08 |
| Co-57 | 1.63e+08 | 1.79e+08 |
| Co-58 | 5.26e+08 | 6.16e+08 |
| Co-60 | 4.40e+09 | 5.18e+09 |
| Ni-59 | 0.00e+00 | 0.00e+00 |
| Ni-63 | 0.00e+00 | 0.00e+00 |
| Ni-65 | 4.24e+05 | 4.93e+05 |
| Cu-64 | 8.67e+05 | 9.82e+05 |
| Zn-65 | 6.88e+08 | 7.92e+08 |
| Zn-69 | 0.00e+00 | 0.00e+00 |
| Zn-69m | 1.82e+06 | 2.13e+06 |
| Se-79 | 0.00e+00 | 0.00e+00 |
| Br-82 | 3.05e+07 | 3.53e+07 |
| Br-83 | 6.96e+03 | 1.01e+04 |
| Br-84 | 2.89e+05 | 3.38e+05 |
| Br-85 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for all age groups by nuclide.
Waterford Steam Electric Station
Pathway : Ground Plane Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | |
|---|---|---|
| | T. Body | Skin |
| Rb-86 | 1.28e+07 | 1.47e+07 |
| Rb-87 | 0.00e+00 | 0.00e+00 |
| Rb-88 | 4.72e+04 | 5.40e+04 |
| Rb-89 | 1.76e+05 | 2.11e+05 |
| Sr-89 | 3.07e+04 | 3.56e+04 |
| Sr-90 | 0.00e+00 | 0.00e+00 |
| Sr-91 | 3.07e+06 | 3.59e+06 |
| Sr-92 | 1.11e+06 | 1.23e+06 |
| Y-90 | 6.42e+03 | 7.58e+03 |
| Y-91 | 1.51e+06 | 1.70e+06 |
| Y-91m | 1.43e+05 | 1.66e+05 |
| Y-92 | 2.58e+05 | 3.06e+05 |
| Y-93 | 2.62e+05 | 3.58e+05 |
| Zr-93 | 0.00e+00 | 0.00e+00 |
| Zr-95 | 3.43e+08 | 3.98e+08 |
| Zr-97 | 4.23e+06 | 4.92e+06 |
| Nb-93m | 2.21e+05 | 2.69e+07 |
| Nb-95 | 1.95e+08 | 2.30e+08 |
| Nb-97 | 2.57e+05 | 3.02e+05 |
| Mo-93 | 6.33e+06 | 2.57e+08 |
| Mo-99 | 5.71e+06 | 6.61e+06 |
| Tc-101 | 2.91e+04 | 3.23e+04 |
| Tc-99 | 0.00e+00 | 0.00e+00 |
| Tc-99m | 2.63e+05 | 3.01e+05 |
| Ru-103 | 1.54e+08 | 1.80e+08 |
| Ru-105 | 9.09e+05 | 1.03e+06 |
| Ru-106 | 3.00e+08 | 3.60e+08 |
| Rh-105 | 1.06e+06 | 1.24e+06 |
| Pd-107 | 0.00e+00 | 0.00e+00 |
| Pd-109 | 2.15e+04 | 2.46e+04 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for all age groups by nuclide.
Waterford Steam Electric Station
Pathway : Ground Plane Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | |
|---|---|---|
| | T. Body | Skin |
| Ag-110m | 3.13e+09 | 3.65e+09 |
| Ag-111 | 1.46e+06 | 1.71e+06 |
| Cd-113m | 6.21e+05 | 7.01e+05 |
| Cd-115m | 0.00e+00 | 0.00e+00 |
| Sn-123 | 0.00e+00 | 7.82e+09 |
| Sn-125 | 5.99e+06 | 6.93e+06 |
| Sn-126 | 2.49e+09 | 2.76e+09 |
| Sb-124 | 8.42e+08 | 9.71e+08 |
| Sb-125 | 7.58e+08 | 8.55e+08 |
| Sb-126 | 1.21e+08 | 1.36e+08 |
| Sb-127 | 2.41e+07 | 2.79e+07 |
| Te-125m | 2.19e+06 | 3.00e+06 |
| Te-127 | 4.25e+03 | 4.68e+03 |
| Te-127m | 1.18e+05 | 1.40e+05 |
| Te-129 | 3.75e+04 | 4.43e+04 |
| Te-129m | 2.82e+07 | 3.30e+07 |
| Te-131 | 4.17e+04 | 4.93e+07 |
| Te-131m | 1.15e+07 | 1.35e+07 |
| Te-132 | 6.05e+06 | 7.12e+06 |
| Te-133m | 6.30e+05 | 7.14e+05 |
| Te-134 | 3.17e+04 | 3.80e+04 |
| I-129 | 1.24e+08 | 2.07e+08 |
| I-130 | 7.87e+06 | 9.56e+06 |
| I-131 | 2.46e+07 | 2.98e+07 |
| I-132 | 1.78e+06 | 2.09e+06 |
| I-133 | 3.50e+06 | 4.26e+06 |
| I-134 | 6.38e+05 | 7.58e+05 |
| I-135 | 3.61e+06 | 4.21e+06 |
| Cs-134 | 2.82e+09 | 3.28e+09 |
| Cs-134m | 8.18e+04 | 9.63e+04 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for all age groups by nuclide.
Waterford Steam Electric Station
Pathway : Ground Plane Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | |
|---|---|---|
| | T. Body | Skin |
| Cs-135 | 0.00e+00 | 0.00e+00 |
| Cs-136 | 2.16e+08 | 2.44e+08 |
| Cs-137 | 1.15e+09 | 1.34e+09 |
| Cs-138 | 5.13e+05 | 5.86e+05 |
| Cs-139 | 4.49e+04 | 5.13e+04 |
| Ba-139 | 1.51e+05 | 1.70e+05 |
| Ba-140 | 2.93e+07 | 3.35e+07 |
| Ba-141 | 5.96e+04 | 6.79e+04 |
| Ba-142 | 6.41e+04 | 7.30e+04 |
| La-140 | 2.74e+07 | 3.11e+07 |
| La-141 | 4.47e+04 | 5.01e+04 |
| La-142 | 1.09e+06 | 1.30e+06 |
| Ce-141 | 1.95e+07 | 2.20e+07 |
| Ce-143 | 3.30e+06 | 3.75e+06 |
| Ce-144 | 5.85e+07 | 6.77e+07 |
| Pr-143 | 0.00e+00 | 0.00e+00 |
| Pr-144 | 2.62e+03 | 3.01e+03 |
| Nd-147 | 1.20e+07 | 1.44e+07 |
| Pm-147 | 0.00e+00 | 0.00e+00 |
| Pm-148 | 2.70e+07 | 3.11e+07 |
| Pm-148m | 6.34e+08 | 3.67e+09 |
| Pm-149 | 6.03e+04 | 7.00e+04 |
| Pm-151 | 2.83e+06 | 2.96e+06 |
| Sm-151 | 1.32e+07 | 5.78e+07 |
| Sm-153 | 5.75e+05 | 6.39e+05 |
| Eu-152 | 1.98e+09 | 2.29e+09 |
| Eu-154 | 2.15e+09 | 2.48e+09 |
| Eu-155 | 8.74e+07 | 9.93e+07 |
| Eu-156 | 1.26e+08 | 1.44e+08 |
| Tb-160 | 6.57e+08 | 7.64e+08 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for all age groups by nuclide.
Waterford Steam Electric Station
Pathway : Ground Plane Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | |
|---|---|---|
| | T. Body | Skin |
| Ho-166m | 2.46e+09 | 2.76e+09 |
| W-181 | 2.43e+05 | 3.24e+05 |
| W-185 | 0.00e+00 | 0.00e+00 |
| W-187 | 3.36e+06 | 3.90e+06 |
| Pb-210 | 3.53e+06 | 4.62e+06 |
| Bi-210 | 0.00e+00 | 0.00e+00 |
| Po-210 | 6.84e+03 | 7.85e+03 |
| Ra-223 | 1.87e+07 | 2.24e+07 |
| Ra-224 | 3.56e+07 | 4.00e+07 |
| Ra-225 | 1.36e+06 | 1.94e+06 |
| Ra-226 | 1.77e+09 | 2.04e+09 |
| Ra-228 | 3.12e+09 | 3.64e+09 |
| Ac-225 | 1.75e+07 | 1.97e+07 |
| Ac-227 | 5.44e+08 | 6.53e+08 |
| Th-227 | 1.03e+07 | 1.27e+07 |
| Th-228 | 2.06e+09 | 2.32e+09 |
| Th-229 | 6.08e+08 | 7.46e+08 |
| Th-230 | 1.80e+09 | 2.07e+09 |
| Th-232 | 8.29e+08 | 1.11e+09 |
| Th-234 | 2.89e+06 | 3.42e+06 |
| Pa-231 | 6.08e+08 | 7.46e+08 |
| Pa-233 | 3.89e+07 | 4.49e+07 |
| U-232 | 7.12e+05 | 7.40e+06 |
| U-233 | 6.35e+08 | 7.74e+08 |
| U-234 | 1.75e+05 | 4.39e+07 |
| U-235 | 8.84e+08 | 1.11e+09 |
| U-236 | 5.80e+03 | 4.97e+06 |
| U-237 | 7.37e+06 | 9.58e+06 |
| U-238 | 3.04e+07 | 4.14e+07 |
| Np-237 | 3.87e+08 | 4.42e+08 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; $P_i$

Pi factors for all age groups by nuclide.
Waterford Steam Electric Station
Pathway : Ground Plane Pathway for Pi

| Nuclide | Organ Dose Conversion Factors | |
|---|---|---|
| | T. Body | Skin |
| Np-238 | 6.48e+06 | 7.41e+06 |
| Np-239 | 2.44e+06 | 2.83e+06 |
| Pu-238 | 3.58e+05 | 4.95e+06 |
| Pu-239 | 2.18e+05 | 2.13e+06 |
| Pu-240 | 3.59e+05 | 4.97e+06 |
| Pu-241 | 1.24e+06 | 1.84e+06 |
| Pu-242 | 3.04e+05 | 4.42e+06 |
| Pu-244 | 2.47e+08 | 2.66e+08 |
| Am-241 | 4.60e+07 | 6.64e+07 |
| Am-242m | 7.17e+06 | 4.96e+07 |
| Am-243 | 3.59e+08 | 4.14e+08 |
| Cm-242 | 7.72e+05 | 3.23e+06 |
| Cm-243 | 6.28e+08 | 7.91e+08 |
| Cm-244 | 7.86e+05 | 4.88e+06 |
| Cm-245 | 2.62e+08 | 3.31e+08 |
| Cm-246 | 2.76e+05 | 4.14e+06 |
| Cm-247 | 6.08e+08 | 7.18e+08 |
| Cm-248 | 1.88e+09 | 1.44e+09 |
| Cf-252 | 1.59e+10 | 1.73e+10 |

Conversion factors are in units of square meter-mrem/yr per uCi/sec.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (GROUND PLANE)

Ground Plane Dose Conversion factors for all age groups by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | |
|---|---|---|
| | T. Body | Skin |
| H-3 | 0.00e+00 | 0.00e+00 |
| Be-10 | 0.00e+00 | 0.00e+00 |
| C-14 | 0.00e+00 | 0.00e+00 |
| N-13 | 7.60e-09 | 8.80e-09 |
| F-18 | 6.80e-09 | 8.00e-09 |
| Na-22 | 1.60e-08 | 1.80e-08 |
| Na-24 | 2.50e-08 | 2.90e-08 |
| P-32 | 0.00e+00 | 0.00e+00 |
| Ca-41 | 3.41e-09 | 4.01e-09 |
| Sc-46 | 1.30e-08 | 1.50e-08 |
| Cr-51 | 2.20e-10 | 2.60e-10 |
| Mn-54 | 5.80e-09 | 6.80e-09 |
| Mn-56 | 1.10e-08 | 1.30e-08 |
| Fe-55 | 0.00e+00 | 0.00e+00 |
| Fe-59 | 8.00e-09 | 9.40e-09 |
| Co-57 | 9.10e-10 | 1.00e-09 |
| Co-58 | 7.00e-09 | 8.20e-09 |
| Co-60 | 1.70e-08 | 2.00e-08 |
| Ni-59 | 0.00e+00 | 0.00e+00 |
| Ni-63 | 0.00e+00 | 0.00e+00 |
| Ni-65 | 3.70e-09 | 4.30e-09 |
| Cu-64 | 1.50e-09 | 1.70e-09 |
| Zn-65 | 4.00e-09 | 4.60e-09 |
| Zn-69 | 0.00e+00 | 0.00e+00 |
| Zn-69m | 2.90e-09 | 3.40e-09 |
| Se-79 | 0.00e+00 | 0.00e+00 |
| Br-82 | 1.90e-08 | 2.20e-08 |
| Br-83 | 6.40e-11 | 9.30e-11 |
| Br-84 | 1.20e-08 | 1.40e-08 |
| Br-85 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of mrem/hr per pCi/square meter.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (GROUND PLANE)

Ground Plane Dose Conversion factors for all age groups by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | |
|---|---|---|
| | T. Body | Skin |
| Rb-86 | 6.30e-10 | 7.20e-10 |
| Rb-87 | 0.00e+00 | 0.00e+00 |
| Rb-88 | 3.50e-09 | 4.00e-09 |
| Rb-89 | 1.50e-08 | 1.80e-08 |
| Sr-89 | 5.60e-13 | 6.50e-13 |
| Sr-90 | 0.00e+00 | 0.00e+00 |
| Sr-91 | 7.10e-09 | 8.30e-09 |
| Sr-92 | 9.00e-09 | 1.00e-08 |
| Y-90 | 2.20e-12 | 2.60e-12 |
| Y-91 | 2.40e-11 | 2.70e-11 |
| Y-91m | 3.80e-09 | 4.40e-09 |
| Y-92 | 1.60e-09 | 1.90e-09 |
| Y-93 | 5.70e-10 | 7.80e-10 |
| Zr-93 | 0.00e+00 | 0.00e+00 |
| Zr-95 | 5.00e-09 | 5.80e-09 |
| Zr-97 | 5.50e-09 | 6.40e-09 |
| Nb-93m | 8.20e-13 | 1.00e-10 |
| Nb-95 | 5.10e-09 | 6.00e-09 |
| Nb-97 | 4.60e-09 | 5.40e-09 |
| Mo-93 | 2.29e-11 | 9.32e-10 |
| Mo-99 | 1.90e-09 | 2.20e-09 |
| Tc-101 | 2.70e-09 | 3.00e-09 |
| Tc-99 | 0.00e+00 | 0.00e+00 |
| Tc-99m | 9.60e-10 | 1.10e-09 |
| Ru-103 | 3.60e-09 | 4.20e-09 |
| Ru-105 | 4.50e-09 | 5.10e-09 |
| Ru-106 | 1.50e-09 | 1.80e-09 |
| Rh-105 | 6.60e-10 | 7.70e-10 |
| Pd-107 | 0.00e+00 | 0.00e+00 |
| Pd-109 | 3.50e-11 | 4.00e-11 |

Conversion factors are in units of mrem/hr per pCi/square meter.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (GROUND PLANE)

Ground Plane Dose Conversion factors for all age groups by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | |
|---|---|---|
| | T. Body | Skin |
| Ag-110m | 1.80e-08 | 2.10e-08 |
| Ag-111 | 1.80e-10 | 2.10e-10 |
| Cd-113m | 2.30e-12 | 2.60e-12 |
| Cd-115m | 0.00e+00 | 0.00e+00 |
| Sn-123 | 0.00e+00 | 6.46e-08 |
| Sn-125 | 5.70e-10 | 6.60e-10 |
| Sn-126 | 9.00e-09 | 1.00e-08 |
| Sb-124 | 1.30e-08 | 1.50e-08 |
| Sb-125 | 3.10e-09 | 3.50e-09 |
| Sb-126 | 8.90e-09 | 1.00e-08 |
| Sb-127 | 5.70e-09 | 6.60e-09 |
| Te-125m | 3.50e-11 | 4.80e-11 |
| Te-127 | 1.00e-11 | 1.10e-11 |
| Te-127m | 1.10e-12 | 1.30e-12 |
| Te-129 | 7.10e-10 | 8.40e-10 |
| Te-129m | 7.70e-10 | 9.00e-10 |
| Te-131 | 2.20e-09 | 2.60e-06 |
| Te-131m | 8.40e-09 | 9.90e-09 |
| Te-132 | 1.70e-09 | 2.00e-09 |
| Te-133m | 1.50e-08 | 1.70e-08 |
| Te-134 | 1.00e-09 | 1.20e-09 |
| I-129 | 4.50e-10 | 7.50e-10 |
| I-130 | 1.40e-08 | 1.70e-08 |
| I-131 | 2.80e-09 | 3.40e-09 |
| I-132 | 1.70e-08 | 2.00e-08 |
| I-133 | 3.70e-09 | 4.50e-09 |
| I-134 | 1.60e-08 | 1.90e-08 |
| I-135 | 1.20e-08 | 1.40e-08 |
| Cs-134 | 1.20e-08 | 1.40e-08 |
| Cs-134m | 6.20e-10 | 7.30e-10 |

Conversion factors are in units of mrem/hr per pCi/square meter.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (GROUND PLANE)

Ground Plane Dose Conversion factors for all age groups by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | |
|---|---|---|
| | T. Body | Skin |
| Cs-135 | 0.00e+00 | 0.00e+00 |
| Cs-136 | 1.50e-08 | 1.70e-08 |
| Cs-137 | 4.20e-09 | 4.90e-09 |
| Cs-138 | 2.10e-08 | 2.40e-08 |
| Cs-139 | 6.30e-09 | 7.20e-09 |
| Ba-139 | 2.40e-09 | 2.70e-09 |
| Ba-140 | 2.10e-09 | 2.40e-09 |
| Ba-141 | 4.30e-09 | 4.90e-09 |
| Ba-142 | 7.90e-09 | 9.00e-09 |
| La-140 | 1.50e-08 | 1.70e-08 |
| La-141 | 2.50e-10 | 2.80e-10 |
| La-142 | 1.50e-08 | 1.80e-08 |
| Ce-141 | 5.50e-10 | 6.20e-10 |
| Ce-143 | 2.20e-09 | 2.50e-09 |
| Ce-144 | 3.20e-10 | 3.70e-10 |
| Pr-143 | 0.00e+00 | 0.00e+00 |
| Pr-144 | 2.00e-10 | 2.30e-10 |
| Nd-147 | 1.00e-09 | 1.20e-09 |
| Pm-147 | 0.00e+00 | 0.00e+00 |
| Pm-148 | 4.60e-09 | 5.30e-09 |
| Pm-148m | 1.41e-08 | 8.16e-08 |
| Pm-149 | 2.50e-11 | 2.90e-11 |
| Pm-151 | 2.20e-09 | 2.30e-09 |
| Sm-151 | 4.80e-11 | 2.10e-10 |
| Sm-153 | 2.70e-10 | 3.00e-10 |
| Eu-152 | 7.37e-09 | 8.53e-09 |
| Eu-154 | 7.80e-09 | 9.00e-09 |
| Eu-155 | 3.81e-10 | 4.33e-10 |
| Eu-156 | 7.60e-09 | 8.70e-09 |
| Tb-160 | 8.60e-09 | 1.00e-08 |

Conversion factors are in units of mrem/hr per pCi/square meter.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (GROUND PLANE)

Ground Plane Dose Conversion factors for all age groups by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | |
|---|---|---|
| | T. Body | Skin |
| Ho-166m | 8.90e-09 | 1.00e-08 |
| W-181 | 2.10e-12 | 2.80e-12 |
| W-185 | 0.00e+00 | 0.00e+00 |
| W-187 | 3.10e-09 | 3.60e-09 |
| Pb-210 | 1.30e-11 | 1.70e-11 |
| Bi-210 | 0.00e+00 | 0.00e+00 |
| Po-210 | 5.40e-14 | 6.20e-14 |
| Ra-223 | 1.50e-09 | 1.80e-09 |
| Ra-224 | 8.90e-09 | 1.00e-08 |
| Ra-225 | 8.40e-11 | 1.20e-10 |
| Ra-226 | 6.40e-09 | 7.40e-09 |
| Ra-228 | 1.20e-08 | 1.40e-08 |
| Ac-225 | 1.60e-09 | 1.80e-09 |
| Ac-227 | 2.00e-09 | 2.40e-09 |
| Th-227 | 5.10e-10 | 6.30e-10 |
| Th-228 | 8.90e-09 | 1.00e-08 |
| Th-229 | 2.20e-09 | 2.70e-09 |
| Th-230 | 6.50e-09 | 7.50e-09 |
| Th-232 | 3.00e-09 | 4.00e-09 |
| Th-234 | 1.10e-10 | 1.30e-10 |
| Pa-231 | 2.20e-09 | 2.70e-09 |
| Pa-233 | 1.30e-09 | 1.50e-09 |
| U-232 | 2.59e-12 | 2.69e-11 |
| U-233 | 2.30e-09 | 2.80e-09 |
| U-234 | 6.32e-13 | 1.59e-10 |
| U-235 | 3.20e-09 | 4.00e-09 |
| U-236 | 2.10e-14 | 1.80e-11 |
| U-237 | 1.00e-09 | 1.30e-09 |
| U-238 | 1.10e-10 | 1.50e-10 |
| Np-237 | 1.40e-09 | 1.60e-09 |

Conversion factors are in units of mrem/hr per pCi/square meter.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (GROUND PLANE)

Ground Plane Dose Conversion factors for all age groups by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | |
|---|---|---|
| | T. Body | Skin |
| Np-238 | 2.80e-09 | 3.20e-09 |
| Np-239 | 9.50e-10 | 1.10e-09 |
| Pu-238 | 1.30e-12 | 1.80e-11 |
| Pu-239 | 7.90e-13 | 7.70e-12 |
| Pu-240 | 1.30e-12 | 1.80e-11 |
| Pu-241 | 4.60e-12 | 6.80e-12 |
| Pu-242 | 1.10e-12 | 1.60e-11 |
| Pu-244 | 8.95e-10 | 9.62e-10 |
| Am-241 | 1.80e-10 | 2.60e-10 |
| Am-242m | 2.60e-11 | 1.80e-10 |
| Am-243 | 1.30e-09 | 1.50e-09 |
| Cm-242 | 5.50e-12 | 2.30e-11 |
| Cm-243 | 2.30e-09 | 2.90e-09 |
| Cm-244 | 2.90e-12 | 1.80e-11 |
| Cm-245 | 9.50e-10 | 1.20e-09 |
| Cm-246 | 1.00e-12 | 1.50e-11 |
| Cm-247 | 2.20e-09 | 2.60e-09 |
| Cm-248 | 6.81e-09 | 5.23e-09 |
| Cf-252 | 6.60e-08 | 7.20e-08 |

Conversion factors are in units of mrem/hr per pCi/square meter.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Adult age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| H-3 | 0.00e+00 | 8.98e-08 | 8.98e-08 | 8.98e-08 | 8.98e-08 | 8.98e-08 | 8.98e-08 |
| Be-10 | 1.98e-04 | 3.06e-05 | 4.96e-06 | 0.00e+00 | 0.00e+00 | 2.22e-04 | 1.67e-05 |
| C-14 | 2.27e-06 | 4.26e-07 | 4.26e-07 | 4.26e-07 | 4.26e-07 | 4.26e-07 | 4.26e-07 |
| N-13 | 6.27e-09 | 6.27e-09 | 6.27e-09 | 6.27e-09 | 6.27e-09 | 6.27e-09 | 6.27e-09 |
| F-18 | 4.71e-07 | 0.00e+00 | 5.19e-08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 9.24e-09 |
| Na-22 | 1.30e-05 | 1.30e-05 | 1.30e-05 | 1.30e-05 | 1.30e-05 | 1.30e-05 | 1.30e-05 |
| Na-24 | 1.28e-06 | 1.28e-06 | 1.28e-06 | 1.28e-06 | 1.28e-06 | 1.28e-06 | 1.28e-06 |
| P-32 | 1.65e-04 | 9.64e-06 | 6.26e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.08e-05 |
| Ca-41 | 3.83e-05 | 0.00e+00 | 4.13e-06 | 0.00e+00 | 0.00e+00 | 3.83e-06 | 2.86e-07 |
| Sc-46 | 5.51e-05 | 1.07e-04 | 3.11e-05 | 0.00e+00 | 9.99e-05 | 0.00e+00 | 3.23e-05 |
| Cr-51 | 0.00e+00 | 0.00e+00 | 1.25e-08 | 7.44e-09 | 2.85e-09 | 1.80e-06 | 4.15e-07 |
| Mn-54 | 0.00e+00 | 4.95e-06 | 7.87e-07 | 0.00e+00 | 1.23e-06 | 1.75e-04 | 9.67e-06 |
| Mn-56 | 0.00e+00 | 1.55e-10 | 2.29e-11 | 0.00e+00 | 1.63e-10 | 1.18e-06 | 2.53e-06 |
| Fe-55 | 3.07e-06 | 2.12e-06 | 4.93e-07 | 0.00e+00 | 0.00e+00 | 9.01e-06 | 7.54e-07 |
| Fe-59 | 1.47e-06 | 3.47e-06 | 1.32e-06 | 0.00e+00 | 0.00e+00 | 1.27e-04 | 2.35e-05 |
| Co-57 | 0.00e+00 | 8.65e-08 | 8.39e-08 | 0.00e+00 | 0.00e+00 | 4.62e-05 | 3.93e-06 |
| Co-58 | 0.00e+00 | 1.98e-07 | 2.59e-07 | 0.00e+00 | 0.00e+00 | 1.16e-04 | 1.33e-05 |
| Co-60 | 0.00e+00 | 1.44e-06 | 1.85e-06 | 0.00e+00 | 0.00e+00 | 7.46e-04 | 3.56e-05 |
| Ni-59 | 4.06e-06 | 1.46e-06 | 6.77e-07 | 0.00e+00 | 0.00e+00 | 8.20e-06 | 6.11e-07 |
| Ni-63 | 5.40e-05 | 3.93e-06 | 1.81e-06 | 0.00e+00 | 0.00e+00 | 2.23e-05 | 1.67e-06 |
| Ni-65 | 1.92e-10 | 2.62e-11 | 1.14e-11 | 0.00e+00 | 0.00e+00 | 7.00e-07 | 1.54e-06 |
| Cu-64 | 0.00e+00 | 1.83e-10 | 7.69e-11 | 0.00e+00 | 5.78e-10 | 8.48e-07 | 6.12e-06 |
| Zn-65 | 4.05e-06 | 1.29e-05 | 5.82e-06 | 0.00e+00 | 8.62e-06 | 1.08e-04 | 6.68e-06 |
| Zn-69 | 4.23e-12 | 8.14e-12 | 5.65e-13 | 0.00e+00 | 5.27e-12 | 1.15e-07 | 2.04e-09 |
| Zn-69m | 1.02e-09 | 2.45e-09 | 2.24e-10 | 0.00e+00 | 1.48e-09 | 2.38e-06 | 1.71e-05 |
| Se-79 | 0.00e+00 | 3.83e-07 | 6.09e-08 | 0.00e+00 | 5.69e-07 | 4.47e-05 | 3.33e-06 |
| Br-82 | 0.00e+00 | 0.00e+00 | 1.69e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.30e-06 |
| Br-83 | 0.00e+00 | 0.00e+00 | 3.01e-08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.90e-08 |
| Br-84 | 0.00e+00 | 0.00e+00 | 3.91e-08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.05e-13 |
| Br-85 | 0.00e+00 | 0.00e+00 | 1.60e-09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of mrem per pCi inhaled.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Adult age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Rb-86 | 0.00e+00 | 1.69e-05 | 7.37e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.08e-06 |
| Rb-87 | 0.00e+00 | 9.86e-06 | 3.21e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.88e-07 |
| Rb-88 | 0.00e+00 | 4.84e-08 | 2.41e-08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.18e-19 |
| Rb-89 | 0.00e+00 | 3.20e-08 | 2.12e-08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.16e-21 |
| Sr-89 | 3.80e-05 | 0.00e+00 | 1.09e-06 | 0.00e+00 | 0.00e+00 | 1.75e-04 | 4.37e-05 |
| Sr-90 | 3.59e-03 | 0.00e+00 | 7.21e-05 | 0.00e+00 | 0.00e+00 | 1.20e-03 | 9.02e-05 |
| Sr-91 | 7.74e-09 | 0.00e+00 | 3.13e-10 | 0.00e+00 | 0.00e+00 | 4.56e-06 | 2.39e-05 |
| Sr-92 | 8.43e-10 | 0.00e+00 | 3.64e-11 | 0.00e+00 | 0.00e+00 | 2.06e-06 | 5.38e-06 |
| Y-90 | 2.61e-07 | 0.00e+00 | 7.01e-09 | 0.00e+00 | 0.00e+00 | 2.12e-05 | 6.32e-05 |
| Y-91 | 5.78e-05 | 0.00e+00 | 1.55e-06 | 0.00e+00 | 0.00e+00 | 2.13e-04 | 4.81e-05 |
| Y-91m | 3.26e-11 | 0.00e+00 | 1.27e-12 | 0.00e+00 | 0.00e+00 | 2.40e-07 | 1.66e-10 |
| Y-92 | 1.29e-09 | 0.00e+00 | 3.77e-11 | 0.00e+00 | 0.00e+00 | 1.96e-06 | 9.19e-06 |
| Y-93 | 1.18e-08 | 0.00e+00 | 3.26e-10 | 0.00e+00 | 0.00e+00 | 6.06e-06 | 5.27e-05 |
| Zr-93 | 5.22e-05 | 2.92e-06 | 1.37e-06 | 0.00e+00 | 1.11e-05 | 2.13e-05 | 1.51e-06 |
| Zr-95 | 1.34e-05 | 4.30e-06 | 2.91e-06 | 0.00e+00 | 6.77e-06 | 2.21e-04 | 1.88e-05 |
| Zr-97 | 1.21e-08 | 2.45e-09 | 1.13e-09 | 0.00e+00 | 3.71e-09 | 9.84e-06 | 6.54e-05 |
| Nb-93m | 3.10e-05 | 1.01e-05 | 2.49e-06 | 0.00e+00 | 1.16e-05 | 3.11e-05 | 2.38e-06 |
| Nb-95 | 1.76e-06 | 9.77e-07 | 5.26e-07 | 0.00e+00 | 9.67e-07 | 6.31e-05 | 1.30e-05 |
| Nb-97 | 2.78e-11 | 7.03e-12 | 2.56e-12 | 0.00e+00 | 8.18e-12 | 3.00e-07 | 3.02e-08 |
| Mo-93 | 0.00e+00 | 1.17e-06 | 3.17e-08 | 0.00e+00 | 3.55e-07 | 5.11e-05 | 3.79e-06 |
| Mo-99 | 0.00e+00 | 1.51e-08 | 2.87e-09 | 0.00e+00 | 3.64e-08 | 1.14e-05 | 3.10e-05 |
| Tc-101 | 5.22e-15 | 7.52e-15 | 7.38e-14 | 0.00e+00 | 1.35e-13 | 4.99e-08 | 1.36e-21 |
| Tc-99 | 3.13e-08 | 4.64e-08 | 1.25e-08 | 0.00e+00 | 5.85e-07 | 1.01e-04 | 7.54e-06 |
| Tc-99m | 1.29e-13 | 3.64e-13 | 4.63e-12 | 0.00e+00 | 5.52e-12 | 9.55e-08 | 5.20e-07 |
| Ru-103 | 1.91e-07 | 0.00e+00 | 8.23e-08 | 0.00e+00 | 7.29e-07 | 6.31e-05 | 1.38e-05 |
| Ru-105 | 9.88e-11 | 0.00e+00 | 3.89e-11 | 0.00e+00 | 1.27e-10 | 1.37e-06 | 6.02e-06 |
| Ru-106 | 8.64e-06 | 0.00e+00 | 1.09e-06 | 0.00e+00 | 1.67e-05 | 1.17e-03 | 1.14e-04 |
| Rh-105 | 9.24e-10 | 6.73e-10 | 4.43e-10 | 0.00e+00 | 2.86e-09 | 2.41e-06 | 1.09e-05 |
| Pd-107 | 0.00e+00 | 8.27e-08 | 5.87e-09 | 0.00e+00 | 6.57e-07 | 9.47e-06 | 7.06e-07 |
| Pd-109 | 0.00e+00 | 4.63e-10 | 1.16e-10 | 0.00e+00 | 2.35e-09 | 1.85e-06 | 1.52e-05 |

Conversion factors are in units of mrem per pCi inhaled.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Adult age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ag-110m | 1.35e-06 | 1.25e-06 | 7.43e-07 | 0.00e+00 | 2.46e-06 | 5.79e-04 | 3.78e-05 |
| Ag-111 | 4.25e-08 | 1.78e-08 | 8.87e-09 | 0.00e+00 | 5.74e-08 | 2.33e-05 | 2.79e-05 |
| Cd-113m | 0.00e+00 | 1.54e-04 | 4.97e-06 | 0.00e+00 | 1.71e-04 | 2.08e-04 | 1.59e-05 |
| Cd-115m | 0.00e+00 | 2.46e-05 | 7.95e-07 | 0.00e+00 | 1.98e-05 | 1.76e-04 | 4.80e-05 |
| Sn-123 | 3.02e-05 | 6.67e-07 | 9.82e-07 | 5.67e-07 | 0.00e+00 | 2.88e-04 | 3.92e-05 |
| Sn-125 | 1.16e-06 | 3.12e-08 | 7.03e-08 | 2.59e-08 | 0.00e+00 | 7.37e-05 | 6.81e-05 |
| Sn-126 | 1.58e-04 | 4.18e-06 | 6.00e-06 | 1.23e-06 | 0.00e+00 | 1.17e-03 | 1.59e-05 |
| Sb-124 | 3.90e-06 | 7.36e-08 | 1.55e-06 | 9.44e-09 | 0.00e+00 | 3.10e-04 | 5.08e-05 |
| Sb-125 | 6.67e-06 | 7.44e-08 | 1.58e-06 | 6.75e-09 | 0.00e+00 | 2.18e-04 | 1.26e-05 |
| Sb-126 | 4.50e-07 | 9.13e-09 | 1.62e-07 | 2.75e-09 | 0.00e+00 | 9.57e-05 | 6.01e-05 |
| Sb-127 | 3.30e-08 | 7.22e-10 | 1.27e-08 | 3.97e-10 | 0.00e+00 | 2.05e-05 | 3.77e-05 |
| Te-125m | 4.27e-07 | 1.98e-07 | 5.84e-08 | 1.31e-07 | 1.55e-06 | 3.92e-05 | 8.83e-06 |
| Te-127 | 1.75e-10 | 8.03e-11 | 3.87e-11 | 1.32e-10 | 6.37e-10 | 8.14e-07 | 7.17e-06 |
| Te-127m | 1.58e-06 | 7.21e-07 | 1.96e-07 | 4.11e-07 | 5.72e-06 | 1.20e-04 | 1.87e-05 |
| Te-129 | 6.22e-12 | 2.99e-12 | 1.55e-12 | 4.87e-12 | 2.34e-11 | 2.42e-07 | 1.96e-08 |
| Te-129m | 1.22e-06 | 5.84e-07 | 1.98e-07 | 4.30e-07 | 4.57e-06 | 1.45e-04 | 4.79e-05 |
| Te-131 | 1.39e-12 | 7.44e-13 | 4.49e-13 | 1.17e-12 | 5.46e-12 | 1.74e-07 | 2.30e-09 |
| Te-131m | 8.74e-09 | 5.45e-09 | 3.63e-09 | 6.88e-09 | 3.86e-08 | 1.82e-05 | 6.95e-05 |
| Te-132 | 3.25e-08 | 2.69e-08 | 2.02e-08 | 2.37e-08 | 1.82e-07 | 3.60e-05 | 6.37e-05 |
| Te-133m | 7.24e-12 | 5.40e-12 | 4.17e-12 | 6.27e-12 | 3.74e-11 | 5.51e-07 | 7.65e-09 |
| Te-134 | 3.84e-12 | 3.22e-12 | 1.57e-12 | 3.44e-12 | 2.18e-11 | 4.34e-07 | 2.97e-11 |
| I-129 | 2.48e-06 | 2.11e-06 | 6.91e-06 | 5.54e-03 | 4.53e-06 | 0.00e+00 | 2.22e-07 |
| I-130 | 5.72e-07 | 1.68e-06 | 6.60e-07 | 1.42e-04 | 2.61e-06 | 0.00e+00 | 9.61e-07 |
| I-131 | 3.15e-06 | 4.47e-06 | 2.56e-06 | 1.49e-03 | 7.66e-06 | 0.00e+00 | 7.85e-07 |
| I-132 | 1.45e-07 | 4.07e-07 | 1.45e-07 | 1.43e-05 | 6.48e-07 | 0.00e+00 | 5.08e-08 |
| I-133 | 1.08e-06 | 1.85e-06 | 5.65e-07 | 2.69e-04 | 3.23e-06 | 0.00e+00 | 1.11e-06 |
| I-134 | 8.05e-08 | 2.16e-07 | 7.69e-08 | 3.73e-06 | 3.44e-07 | 0.00e+00 | 1.26e-10 |
| I-135 | 3.35e-07 | 8.73e-07 | 3.21e-07 | 5.60e-05 | 1.39e-06 | 0.00e+00 | 6.56e-07 |
| Cs-134 | 4.66e-05 | 1.06e-04 | 9.10e-05 | 0.00e+00 | 3.59e-05 | 1.22e-05 | 1.30e-06 |
| Cs-134m | 1.59e-08 | 3.20e-08 | 1.72e-08 | 0.00e+00 | 1.83e-08 | 2.93e-09 | 7.92e-09 |

Conversion factors are in units of mrem per pCi inhaled.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Adult age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Cs-135 | 1.46e-05 | 1.29e-05 | 5.99e-06 | 0.00e+00 | 5.11e-06 | 1.57e-06 | 2.11e-07 |
| Cs-136 | 4.88e-06 | 1.83e-05 | 1.38e-05 | 0.00e+00 | 1.07e-05 | 1.50e-06 | 1.46e-06 |
| Cs-137 | 5.98e-05 | 7.76e-05 | 5.35e-05 | 0.00e+00 | 2.78e-05 | 9.40e-06 | 1.05e-06 |
| Cs-138 | 4.14e-08 | 7.76e-08 | 4.05e-08 | 0.00e+00 | 6.00e-08 | 6.07e-09 | 2.33e-13 |
| Cs-139 | 2.56e-08 | 3.63e-08 | 1.39e-08 | 0.00e+00 | 3.05e-08 | 2.84e-09 | 5.49e-31 |
| Ba-139 | 1.17e-10 | 8.32e-14 | 3.42e-12 | 0.00e+00 | 7.78e-14 | 4.70e-07 | 1.12e-07 |
| Ba-140 | 4.88e-06 | 6.13e-09 | 3.21e-07 | 0.00e+00 | 2.09e-09 | 1.59e-04 | 2.73e-05 |
| Ba-141 | 1.25e-11 | 9.41e-15 | 4.20e-13 | 0.00e+00 | 8.75e-15 | 2.42e-07 | 1.45e-17 |
| Ba-142 | 3.29e-12 | 3.38e-15 | 2.07e-13 | 0.00e+00 | 2.86e-15 | 1.49e-07 | 1.96e-26 |
| La-140 | 4.30e-08 | 2.17e-08 | 5.73e-09 | 0.00e+00 | 0.00e+00 | 1.70e-05 | 5.73e-05 |
| La-141 | 5.34e-10 | 1.66e-10 | 2.71e-11 | 0.00e+00 | 0.00e+00 | 1.35e-06 | 7.31e-06 |
| La-142 | 8.54e-11 | 3.88e-11 | 9.65e-12 | 0.00e+00 | 0.00e+00 | 7.91e-07 | 2.64e-07 |
| Ce-141 | 2.49e-06 | 1.69e-06 | 1.91e-07 | 0.00e+00 | 7.83e-07 | 4.52e-05 | 1.50e-05 |
| Ce-143 | 2.33e-08 | 1.72e-08 | 1.91e-09 | 0.00e+00 | 7.60e-09 | 9.97e-06 | 2.83e-05 |
| Ce-144 | 4.29e-04 | 1.79e-04 | 2.30e-05 | 0.00e+00 | 1.06e-04 | 9.72e-04 | 1.02e-04 |
| Pr-143 | 1.17e-06 | 4.69e-07 | 5.80e-08 | 0.00e+00 | 2.70e-07 | 3.51e-05 | 2.50e-05 |
| Pr-144 | 3.76e-12 | 1.56e-12 | 1.91e-13 | 0.00e+00 | 8.81e-13 | 1.27e-07 | 2.69e-18 |
| Nd-147 | 6.59e-07 | 7.62e-07 | 4.56e-08 | 0.00e+00 | 4.45e-07 | 2.76e-05 | 2.16e-05 |
| Pm-147 | 8.37e-05 | 7.87e-06 | 3.19e-06 | 0.00e+00 | 1.49e-05 | 6.60e-05 | 5.54e-06 |
| Pm-148 | 3.84e-07 | 6.37e-08 | 3.20e-08 | 0.00e+00 | 1.20e-07 | 3.91e-05 | 5.80e-05 |
| Pm-148m | 9.82e-06 | 2.54e-06 | 1.94e-06 | 0.00e+00 | 3.85e-06 | 2.14e-04 | 4.18e-05 |
| Pm-149 | 3.44e-08 | 4.87e-09 | 1.99e-09 | 0.00e+00 | 9.19e-09 | 7.21e-06 | 2.50e-05 |
| Pm-151 | 8.50e-09 | 1.42e-09 | 7.21e-10 | 0.00e+00 | 2.55e-09 | 3.94e-06 | 2.00e-05 |
| Sm-151 | 8.59e-05 | 1.48e-05 | 3.55e-06 | 0.00e+00 | 1.66e-05 | 4.45e-05 | 3.25e-06 |
| Sm-153 | 1.70e-08 | 1.42e-08 | 1.04e-09 | 0.00e+00 | 4.59e-09 | 4.14e-06 | 1.58e-05 |
| Eu-152 | 2.38e-04 | 5.41e-05 | 4.76e-05 | 0.00e+00 | 3.35e-04 | 3.43e-04 | 1.59e-05 |
| Eu-154 | 7.40e-04 | 9.10e-05 | 6.48e-05 | 0.00e+00 | 4.36e-04 | 5.84e-04 | 3.40e-05 |
| Eu-155 | 1.01e-04 | 1.43e-05 | 9.21e-06 | 0.00e+00 | 6.59e-05 | 9.46e-05 | 5.95e-06 |
| Eu-156 | 1.93e-06 | 1.48e-06 | 2.40e-07 | 0.00e+00 | 9.95e-07 | 8.56e-05 | 4.50e-05 |
| Tb-160 | 2.21e-05 | 0.00e+00 | 2.75e-06 | 0.00e+00 | 9.10e-06 | 1.92e-04 | 2.68e-05 |

Conversion factors are in units of mrem per pCi inhaled.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Adult age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ho-166m | 3.37e-04 | 1.05e-04 | 8.00e-05 | 0.00e+00 | 1.57e-04 | 3.94e-04 | 1.59e-05 |
| W-181 | 6.23e-09 | 2.03e-09 | 2.17e-10 | 0.00e+00 | 0.00e+00 | 1.71e-06 | 2.53e-07 |
| W-185 | 1.95e-07 | 6.47e-08 | 6.81e-09 | 0.00e+00 | 0.00e+00 | 5.57e-05 | 1.07e-05 |
| W-187 | 1.06e-09 | 8.85e-10 | 3.10e-10 | 0.00e+00 | 0.00e+00 | 3.63e-06 | 1.94e-05 |
| Pb-210 | 2.64e-02 | 6.73e-03 | 8.37e-04 | 0.00e+00 | 2.12e-02 | 2.62e-02 | 1.51e-06 |
| Bi-210 | 2.31e-07 | 1.59e-06 | 1.32e-07 | 0.00e+00 | 1.92e-05 | 1.11e-03 | 2.95e-05 |
| Po-210 | 3.97e-04 | 8.60e-04 | 9.58e-05 | 0.00e+00 | 2.95e-03 | 3.14e-02 | 4.19e-05 |
| Ra-223 | 1.80e-04 | 2.77e-07 | 3.60e-05 | 0.00e+00 | 7.85e-06 | 2.55e-02 | 2.84e-04 |
| Ra-224 | 1.98e-05 | 4.78e-08 | 3.96e-06 | 0.00e+00 | 1.35e-06 | 8.77e-03 | 3.01e-04 |
| Ra-225 | 3.00e-04 | 3.56e-07 | 5.99e-05 | 0.00e+00 | 1.01e-05 | 2.92e-02 | 2.71e-04 |
| Ra-226 | 1.25e-01 | 2.39e-06 | 9.14e-02 | 0.00e+00 | 6.77e-05 | 1.17e-01 | 2.94e-04 |
| Ra-228 | 4.41e-02 | 1.23e-06 | 4.78e-02 | 0.00e+00 | 3.48e-05 | 1.61e-01 | 5.00e-05 |
| Ac-225 | 4.23e-04 | 5.82e-04 | 2.84e-05 | 0.00e+00 | 6.63e-05 | 2.21e-02 | 2.52e-04 |
| Ac-227 | 2.30e+00 | 3.05e-01 | 1.36e-01 | 0.00e+00 | 9.82e-02 | 2.41e-01 | 5.08e-05 |
| Th-227 | 2.17e-04 | 3.92e-06 | 6.25e-06 | 0.00e+00 | 2.22e-05 | 3.77e-02 | 3.34e-04 |
| Th-228 | 2.00e-01 | 3.39e-03 | 6.77e-03 | 0.00e+00 | 1.89e-02 | 1.01e+00 | 3.49e-04 |
| Th-229 | 1.51e+01 | 4.34e-01 | 2.51e-01 | 0.00e+00 | 2.13e+00 | 3.62e+00 | 4.83e-05 |
| Th-230 | 2.29e+00 | 1.31e-01 | 6.36e-02 | 0.00e+00 | 6.40e-01 | 6.21e-01 | 3.73e-05 |
| Th-232 | 2.56e+00 | 1.12e-01 | 9.04e-04 | 0.00e+00 | 5.47e-01 | 5.96e-01 | 3.17e-05 |
| Th-234 | 1.63e-06 | 9.56e-08 | 4.70e-08 | 0.00e+00 | 5.41e-07 | 1.89e-04 | 7.03e-05 |
| Pa-231 | 5.08e+00 | 1.91e-01 | 1.98e-01 | 0.00e+00 | 1.07e+00 | 5.75e-02 | 4.44e-05 |
| Pa-233 | 1.21e-06 | 2.42e-07 | 2.09e-07 | 0.00e+00 | 9.15e-07 | 3.52e-05 | 1.02e-05 |
| U-232 | 5.14e-02 | 0.00e+00 | 3.66e-03 | 0.00e+00 | 5.56e-03 | 2.22e-01 | 4.21e-05 |
| U-233 | 1.09e-02 | 0.00e+00 | 6.60e-04 | 0.00e+00 | 2.54e-03 | 5.32e-02 | 3.89e-05 |
| U-234 | 1.04e-02 | 0.00e+00 | 6.46e-04 | 0.00e+00 | 2.49e-03 | 5.22e-02 | 3.81e-05 |
| U-235 | 1.00e-02 | 0.00e+00 | 6.07e-04 | 0.00e+00 | 2.34e-03 | 4.90e-02 | 4.84e-05 |
| U-236 | 1.00e-02 | 0.00e+00 | 6.20e-04 | 0.00e+00 | 2.39e-03 | 5.00e-02 | 3.57e-05 |
| U-237 | 3.67e-08 | 0.00e+00 | 9.77e-09 | 0.00e+00 | 1.51e-07 | 1.02e-05 | 1.20e-05 |
| U-238 | 9.58e-03 | 0.00e+00 | 5.67e-04 | 0.00e+00 | 2.18e-03 | 4.58e-02 | 3.41e-05 |
| Np-237 | 1.56e+00 | 1.00e+00 | 6.87e-02 | 0.00e+00 | 5.10e-01 | 5.22e-02 | 4.92e-05 |

Conversion factors are in units of mrem per pCi inhaled.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Adult age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Np-238 | 2.96e-07 | 7.20e-08 | 4.61e-09 | 0.00e+00 | 2.72e-08 | 1.02e-05 | 2.13e-05 |
| Np-239 | 2.87e-08 | 2.54e-08 | 1.55e-09 | 0.00e+00 | 8.75e-09 | 4.70e-06 | 1.49e-05 |
| Pu-238 | 1.43e+00 | 9.71e-01 | 6.90e-02 | 0.00e+00 | 2.96e-01 | 1.82e-01 | 4.52e-05 |
| Pu-239 | 1.66e+00 | 1.07e+00 | 7.75e-02 | 0.00e+00 | 3.30e-01 | 1.72e-01 | 4.13e-05 |
| Pu-240 | 1.65e+00 | 1.07e+00 | 7.73e-02 | 0.00e+00 | 3.29e-01 | 1.72e-01 | 4.21e-05 |
| Pu-241 | 3.42e-02 | 8.69e-03 | 1.29e-03 | 0.00e+00 | 5.93e-03 | 1.52e-04 | 8.65e-07 |
| Pu-242 | 1.53e+00 | 1.03e+00 | 7.46e-02 | 0.00e+00 | 3.17e-01 | 1.65e-01 | 4.05e-05 |
| Pu-244 | 1.79e+00 | 1.18e+00 | 8.54e-02 | 0.00e+00 | 3.64e-01 | 1.89e-01 | 6.03e-05 |
| Am-241 | 1.68e+00 | 1.13e+00 | 6.71e-02 | 0.00e+00 | 5.04e-01 | 6.06e-02 | 4.60e-05 |
| Am-242m | 1.70e+00 | 1.06e+00 | 6.73e-02 | 0.00e+00 | 5.01e-01 | 2.44e-02 | 5.79e-05 |
| Am-243 | 1.68e+00 | 1.10e+00 | 6.57e-02 | 0.00e+00 | 4.95e-01 | 5.75e-02 | 5.40e-05 |
| Cm-242 | 2.22e-02 | 1.77e-02 | 9.84e-04 | 0.00e+00 | 4.48e-03 | 3.92e-02 | 4.91e-05 |
| Cm-243 | 1.10e+00 | 7.61e-01 | 4.61e-02 | 0.00e+00 | 2.15e-01 | 6.31e-02 | 4.84e-05 |
| Cm-244 | 8.37e-01 | 5.88e-01 | 3.51e-02 | 0.00e+00 | 1.64e-01 | 6.06e-02 | 4.68e-05 |
| Cm-245 | 1.74e+00 | 1.14e+00 | 7.14e-02 | 0.00e+00 | 3.33e-01 | 5.85e-02 | 4.36e-05 |
| Cm-246 | 1.73e+00 | 1.14e+00 | 7.13e-02 | 0.00e+00 | 3.33e-01 | 5.96e-02 | 4.29e-05 |
| Cm-247 | 1.68e+00 | 1.12e+00 | 7.03e-02 | 0.00e+00 | 3.28e-01 | 5.85e-02 | 5.63e-05 |
| Cm-248 | 1.40e+01 | 9.26e+00 | 5.79e-01 | 0.00e+00 | 2.70e+00 | 4.82e-01 | 9.09e-04 |
| Cf-252 | 5.43e-01 | 0.00e+00 | 2.33e-02 | 0.00e+00 | 0.00e+00 | 1.99e-01 | 1.78e-04 |

Conversion factors are in units of mrem per pCi inhaled.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Teen age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| H-3 | 0.00e+00 | 9.06e-08 | 9.06e-08 | 9.06e-08 | 9.06e-08 | 9.06e-08 | 9.06e-08 |
| Be-10 | 2.78e-04 | 4.33e-05 | 7.09e-06 | 0.00e+00 | 0.00e+00 | 3.84e-04 | 1.77e-05 |
| C-14 | 3.25e-06 | 6.09e-07 | 6.09e-07 | 6.09e-07 | 6.09e-07 | 6.09e-07 | 6.09e-07 |
| N-13 | 8.65e-09 | 8.65e-09 | 8.65e-09 | 8.65e-09 | 8.65e-09 | 8.65e-09 | 8.65e-09 |
| F-18 | 6.52e-07 | 0.00e+00 | 7.10e-08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.89e-08 |
| Na-22 | 1.76e-05 | 1.76e-05 | 1.76e-05 | 1.76e-05 | 1.76e-05 | 1.76e-05 | 1.76e-05 |
| Na-24 | 1.72e-06 | 1.72e-06 | 1.72e-06 | 1.72e-06 | 1.72e-06 | 1.72e-06 | 1.72e-06 |
| P-32 | 2.36e-04 | 1.37e-05 | 8.95e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.16e-05 |
| Ca-41 | 4.05e-05 | 0.00e+00 | 4.38e-06 | 0.00e+00 | 0.00e+00 | 1.01e-01 | 3.03e-07 |
| Sc-46 | 7.24e-05 | 1.41e-04 | 4.18e-05 | 0.00e+00 | 1.35e-04 | 0.00e+00 | 2.98e-05 |
| Cr-51 | 0.00e+00 | 0.00e+00 | 1.69e-08 | 9.37e-09 | 3.84e-09 | 2.62e-06 | 3.75e-07 |
| Mn-54 | 0.00e+00 | 6.39e-06 | 1.05e-06 | 0.00e+00 | 1.59e-06 | 2.48e-04 | 8.35e-06 |
| Mn-56 | 0.00e+00 | 2.12e-10 | 3.15e-11 | 0.00e+00 | 2.24e-10 | 1.90e-06 | 7.18e-06 |
| Fe-55 | 4.18e-06 | 2.98e-06 | 6.93e-07 | 0.00e+00 | 0.00e+00 | 1.55e-05 | 7.99e-07 |
| Fe-59 | 1.99e-06 | 4.62e-06 | 1.79e-06 | 0.00e+00 | 0.00e+00 | 1.91e-04 | 2.23e-05 |
| Co-57 | 0.00e+00 | 1.18e-07 | 1.15e-07 | 0.00e+00 | 0.00e+00 | 7.33e-05 | 3.93e-06 |
| Co-58 | 0.00e+00 | 2.59e-07 | 3.47e-07 | 0.00e+00 | 0.00e+00 | 1.68e-04 | 1.19e-05 |
| Co-60 | 0.00e+00 | 1.89e-06 | 2.48e-06 | 0.00e+00 | 0.00e+00 | 1.09e-03 | 3.24e-05 |
| Ni-59 | 5.44e-06 | 2.02e-06 | 9.24e-07 | 0.00e+00 | 0.00e+00 | 1.41e-05 | 6.48e-07 |
| Ni-63 | 7.25e-05 | 5.43e-06 | 2.47e-06 | 0.00e+00 | 0.00e+00 | 3.84e-05 | 1.77e-06 |
| Ni-65 | 2.73e-10 | 3.66e-11 | 1.59e-11 | 0.00e+00 | 0.00e+00 | 1.17e-06 | 4.59e-06 |
| Cu-64 | 0.00e+00 | 2.54e-10 | 1.06e-10 | 0.00e+00 | 8.01e-10 | 1.39e-06 | 7.68e-06 |
| Zn-65 | 4.82e-06 | 1.67e-05 | 7.80e-06 | 0.00e+00 | 1.08e-05 | 1.55e-04 | 5.83e-06 |
| Zn-69 | 6.04e-12 | 1.15e-11 | 8.07e-13 | 0.00e+00 | 7.53e-12 | 1.98e-07 | 3.56e-08 |
| Zn-69m | 1.44e-09 | 3.39e-09 | 3.11e-10 | 0.00e+00 | 2.06e-09 | 3.92e-06 | 2.14e-05 |
| Se-79 | 0.00e+00 | 5.43e-07 | 8.71e-08 | 0.00e+00 | 8.13e-07 | 7.71e-05 | 3.53e-06 |
| Br-82 | 0.00e+00 | 0.00e+00 | 2.28e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-83 | 0.00e+00 | 0.00e+00 | 4.30e-08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-84 | 0.00e+00 | 0.00e+00 | 5.41e-08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-85 | 0.00e+00 | 0.00e+00 | 2.29e-09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of mrem per pCi inhaled.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Teen age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Rb-86 | 0.00e+00 | 2.38e-05 | 1.05e-05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.21e-06 |
| Rb-87 | 0.00e+00 | 1.40e-05 | 4.58e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.05e-07 |
| Rb-88 | 0.00e+00 | 6.82e-08 | 3.40e-08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.65e-15 |
| Rb-89 | 0.00e+00 | 4.40e-08 | 2.91e-08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.22e-17 |
| Sr-89 | 5.43e-05 | 0.00e+00 | 1.56e-06 | 0.00e+00 | 0.00e+00 | 3.02e-04 | 4.64e-05 |
| Sr-90 | 4.14e-03 | 0.00e+00 | 8.33e-05 | 0.00e+00 | 0.00e+00 | 2.06e-03 | 9.56e-05 |
| Sr-91 | 1.10e-08 | 0.00e+00 | 4.39e-10 | 0.00e+00 | 0.00e+00 | 7.59e-06 | 3.24e-05 |
| Sr-92 | 1.19e-09 | 0.00e+00 | 5.08e-11 | 0.00e+00 | 0.00e+00 | 3.43e-06 | 1.49e-05 |
| Y-90 | 3.73e-07 | 0.00e+00 | 1.00e-08 | 0.00e+00 | 0.00e+00 | 3.66e-05 | 6.99e-05 |
| Y-91 | 8.26e-05 | 0.00e+00 | 2.21e-06 | 0.00e+00 | 0.00e+00 | 3.67e-04 | 5.11e-05 |
| Y-91m | 4.63e-11 | 0.00e+00 | 1.77e-12 | 0.00e+00 | 0.00e+00 | 4.00e-07 | 3.77e-09 |
| Y-92 | 1.84e-09 | 0.00e+00 | 5.36e-11 | 0.00e+00 | 0.00e+00 | 3.35e-06 | 2.06e-05 |
| Y-93 | 1.69e-08 | 0.00e+00 | 4.65e-10 | 0.00e+00 | 0.00e+00 | 1.04e-05 | 7.24e-05 |
| Zr-93 | 6.83e-05 | 3.38e-06 | 1.84e-06 | 0.00e+00 | 1.16e-05 | 3.67e-05 | 1.60e-06 |
| Zr-95 | 1.82e-05 | 5.73e-06 | 3.94e-06 | 0.00e+00 | 8.42e-06 | 3.36e-04 | 1.86e-05 |
| Zr-97 | 1.72e-08 | 3.40e-09 | 1.57e-09 | 0.00e+00 | 5.15e-09 | 1.62e-05 | 7.88e-05 |
| Nb-93m | 4.14e-05 | 1.36e-05 | 3.41e-06 | 0.00e+00 | 1.59e-05 | 5.36e-05 | 2.52e-06 |
| Nb-95 | 2.32e-06 | 1.29e-06 | 7.08e-07 | 0.00e+00 | 1.25e-06 | 9.39e-05 | 1.21e-05 |
| Nb-97 | 3.92e-11 | 9.72e-12 | 3.55e-12 | 0.00e+00 | 1.14e-11 | 4.91e-07 | 2.71e-07 |
| Mo-93 | 0.00e+00 | 1.66e-06 | 4.52e-08 | 0.00e+00 | 5.06e-07 | 8.81e-05 | 3.99e-06 |
| Mo-99 | 0.00e+00 | 2.11e-08 | 4.03e-09 | 0.00e+00 | 5.14e-08 | 1.92e-05 | 3.36e-05 |
| Tc-101 | 7.40e-15 | 1.05e-14 | 1.03e-13 | 0.00e+00 | 1.90e-13 | 8.34e-08 | 1.09e-16 |
| Tc-99 | 4.48e-08 | 6.58e-08 | 1.79e-08 | 0.00e+00 | 8.35e-07 | 1.74e-04 | 7.99e-06 |
| Tc-99m | 1.73e-13 | 4.83e-13 | 6.24e-12 | 0.00e+00 | 7.20e-12 | 1.44e-07 | 7.66e-07 |
| Ru-103 | 2.63e-07 | 0.00e+00 | 1.12e-07 | 0.00e+00 | 9.29e-07 | 9.79e-05 | 1.36e-05 |
| Ru-105 | 1.40e-10 | 0.00e+00 | 5.42e-11 | 0.00e+00 | 1.76e-10 | 2.27e-06 | 1.13e-05 |
| Ru-106 | 1.23e-05 | 0.00e+00 | 1.55e-06 | 0.00e+00 | 2.38e-05 | 2.01e-03 | 1.20e-04 |
| Rh-105 | 1.32e-09 | 9.48e-10 | 6.24e-10 | 0.00e+00 | 4.04e-09 | 4.09e-06 | 1.23e-05 |
| Pd-107 | 0.00e+00 | 1.17e-07 | 8.39e-09 | 0.00e+00 | 9.39e-07 | 1.63e-05 | 7.49e-07 |
| Pd-109 | 0.00e+00 | 6.56e-10 | 1.66e-10 | 0.00e+00 | 3.36e-09 | 3.19e-06 | 1.96e-05 |

Conversion factors are in units of mrem per pCi inhaled.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Teen age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ag-110m | 1.73e-06 | 1.64e-06 | 9.99e-07 | 0.00e+00 | 3.13e-06 | 8.44e-04 | 3.41e-05 |
| Ag-111 | 6.07e-08 | 2.52e-08 | 1.26e-08 | 0.00e+00 | 8.17e-08 | 4.00e-05 | 3.00e-05 |
| Cd-113m | 0.00e+00 | 2.17e-04 | 7.10e-06 | 0.00e+00 | 2.43e-04 | 3.59e-04 | 1.68e-05 |
| Cd-115m | 0.00e+00 | 3.48e-05 | 1.14e-06 | 0.00e+00 | 2.82e-05 | 3.03e-04 | 5.10e-05 |
| Sn-123 | 4.31e-05 | 9.44e-07 | 1.40e-06 | 7.55e-07 | 0.00e+00 | 4.96e-04 | 4.16e-05 |
| Sn-125 | 1.66e-06 | 4.42e-08 | 9.99e-08 | 3.45e-08 | 0.00e+00 | 1.26e-04 | 7.29e-05 |
| Sn-126 | 2.18e-04 | 5.39e-06 | 8.24e-06 | 1.42e-06 | 0.00e+00 | 1.72e-03 | 1.68e-05 |
| Sb-124 | 5.38e-06 | 9.92e-08 | 2.10e-06 | 1.22e-08 | 0.00e+00 | 4.81e-04 | 4.98e-05 |
| Sb-125 | 9.23e-06 | 1.01e-07 | 2.15e-06 | 8.80e-09 | 0.00e+00 | 3.42e-04 | 1.24e-05 |
| Sb-126 | 6.19e-07 | 1.27e-08 | 2.23e-07 | 3.50e-09 | 0.00e+00 | 1.55e-04 | 6.01e-05 |
| Sb-127 | 4.64e-08 | 9.92e-10 | 1.75e-08 | 5.21e-10 | 0.00e+00 | 3.31e-05 | 3.94e-05 |
| Te-125m | 6.10e-07 | 2.80e-07 | 8.34e-08 | 1.75e-07 | 0.00e+00 | 6.70e-05 | 9.38e-06 |
| Te-127 | 2.51e-10 | 1.14e-10 | 5.52e-11 | 1.77e-10 | 9.10e-10 | 1.40e-06 | 1.01e-05 |
| Te-127m | 2.25e-06 | 1.02e-06 | 2.73e-07 | 5.48e-07 | 8.17e-06 | 2.07e-04 | 1.99e-05 |
| Te-129 | 8.87e-12 | 4.22e-12 | 2.20e-12 | 6.48e-12 | 3.32e-11 | 4.12e-07 | 2.02e-07 |
| Te-129m | 1.74e-06 | 8.23e-07 | 2.81e-07 | 5.72e-07 | 6.49e-06 | 2.47e-04 | 5.06e-05 |
| Te-131 | 1.97e-12 | 1.04e-12 | 6.30e-13 | 1.55e-12 | 7.72e-12 | 2.92e-07 | 1.89e-09 |
| Te-131m | 1.23e-08 | 7.51e-09 | 5.03e-09 | 9.06e-09 | 5.49e-08 | 2.97e-05 | 7.76e-05 |
| Te-132 | 4.50e-08 | 3.63e-08 | 2.74e-08 | 3.07e-08 | 2.44e-07 | 5.61e-05 | 5.79e-05 |
| Te-133m | 1.01e-11 | 7.33e-12 | 5.71e-12 | 8.18e-12 | 5.07e-11 | 8.71e-07 | 1.23e-07 |
| Te-134 | 5.31e-12 | 4.35e-12 | 3.64e-12 | 4.46e-12 | 2.91e-11 | 6.75e-07 | 1.37e-09 |
| I-129 | 3.53e-06 | 2.94e-06 | 4.90e-06 | 3.66e-03 | 5.26e-06 | 0.00e+00 | 2.29e-07 |
| I-130 | 7.80e-07 | 2.24e-06 | 8.96e-07 | 1.86e-04 | 3.44e-06 | 0.00e+00 | 1.14e-06 |
| I-131 | 4.43e-06 | 6.14e-06 | 3.30e-06 | 1.83e-03 | 1.05e-05 | 0.00e+00 | 8.11e-07 |
| I-132 | 1.99e-07 | 5.47e-07 | 1.97e-07 | 1.89e-05 | 8.65e-07 | 0.00e+00 | 1.59e-07 |
| I-133 | 1.52e-06 | 2.56e-06 | 7.78e-07 | 3.65e-04 | 4.49e-06 | 0.00e+00 | 1.29e-06 |
| I-134 | 1.11e-07 | 2.90e-07 | 1.05e-07 | 4.94e-06 | 4.58e-07 | 0.00e+00 | 2.55e-09 |
| I-135 | 4.62e-07 | 1.18e-06 | 4.36e-07 | 7.76e-05 | 1.86e-06 | 0.00e+00 | 8.69e-07 |
| Cs-134 | 6.28e-05 | 1.41e-04 | 6.86e-05 | 0.00e+00 | 4.69e-05 | 1.83e-05 | 1.22e-06 |
| Cs-134m | 2.20e-08 | 4.35e-08 | 2.35e-08 | 0.00e+00 | 2.54e-08 | 4.56e-09 | 2.02e-08 |

Conversion factors are in units of mrem per pCi inhaled.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Teen age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Cs-135 | 2.08e-05 | 1.82e-05 | 4.47e-06 | 0.00e+00 | 7.30e-06 | 2.70e-06 | 2.23e-07 |
| Cs-136 | 6.44e-06 | 2.42e-05 | 1.71e-05 | 0.00e+00 | 1.38e-05 | 2.22e-06 | 1.36e-06 |
| Cs-137 | 8.38e-05 | 1.06e-04 | 3.89e-05 | 0.00e+00 | 3.80e-05 | 1.51e-05 | 1.06e-06 |
| Cs-138 | 5.82e-08 | 1.07e-07 | 5.58e-08 | 0.00e+00 | 8.28e-08 | 9.84e-09 | 3.38e-11 |
| Cs-139 | 3.65e-08 | 5.12e-08 | 1.97e-08 | 0.00e+00 | 4.34e-08 | 4.86e-09 | 1.66e-23 |
| Ba-139 | 1.67e-10 | 1.18e-13 | 4.87e-12 | 0.00e+00 | 1.11e-13 | 8.08e-07 | 8.06e-07 |
| Ba-140 | 6.84e-06 | 8.38e-09 | 4.40e-07 | 0.00e+00 | 2.85e-09 | 2.54e-04 | 2.86e-05 |
| Ba-141 | 1.78e-11 | 1.32e-14 | 5.93e-13 | 0.00e+00 | 1.23e-14 | 4.11e-07 | 9.33e-14 |
| Ba-142 | 4.62e-12 | 4.63e-15 | 2.84e-13 | 0.00e+00 | 3.92e-15 | 2.39e-07 | 5.99e-20 |
| La-140 | 5.99e-08 | 2.95e-08 | 7.82e-09 | 0.00e+00 | 0.00e+00 | 2.68e-05 | 6.09e-05 |
| La-141 | 7.63e-10 | 2.35e-10 | 3.87e-11 | 0.00e+00 | 0.00e+00 | 2.31e-06 | 1.54e-05 |
| La-142 | 1.20e-10 | 5.31e-11 | 1.32e-11 | 0.00e+00 | 0.00e+00 | 1.27e-06 | 1.50e-06 |
| Ce-141 | 3.55e-06 | 2.37e-06 | 2.71e-07 | 0.00e+00 | 1.11e-06 | 7.67e-05 | 1.58e-05 |
| Ce-143 | 3.32e-08 | 2.42e-08 | 2.70e-09 | 0.00e+00 | 1.08e-08 | 1.63e-05 | 3.19e-05 |
| Ce-144 | 6.11e-04 | 2.53e-04 | 3.28e-05 | 0.00e+00 | 1.51e-04 | 1.67e-03 | 1.08e-04 |
| Pr-143 | 1.67e-06 | 6.64e-07 | 8.28e-08 | 0.00e+00 | 3.86e-07 | 6.04e-05 | 2.67e-05 |
| Pr-144 | 5.37e-12 | 2.20e-12 | 2.72e-13 | 0.00e+00 | 1.26e-12 | 2.19e-07 | 2.94e-14 |
| Nd-147 | 9.83e-07 | 1.07e-06 | 6.41e-08 | 0.00e+00 | 6.28e-07 | 4.65e-05 | 2.28e-05 |
| Pm-147 | 1.15e-04 | 1.10e-05 | 4.50e-06 | 0.00e+00 | 2.10e-05 | 1.14e-04 | 5.87e-06 |
| Pm-148 | 5.44e-07 | 8.88e-08 | 4.48e-08 | 0.00e+00 | 1.60e-07 | 6.52e-05 | 6.14e-05 |
| Pm-148m | 1.32e-05 | 3.35e-06 | 2.62e-06 | 0.00e+00 | 5.07e-06 | 3.20e-04 | 4.10e-05 |
| Pm-149 | 4.91e-08 | 6.89e-09 | 2.84e-09 | 0.00e+00 | 1.31e-08 | 1.24e-05 | 2.79e-05 |
| Pm-151 | 1.20e-08 | 1.99e-09 | 1.01e-09 | 0.00e+00 | 3.57e-09 | 6.56e-06 | 2.27e-05 |
| Sm-151 | 1.07e-04 | 2.10e-05 | 4.86e-06 | 0.00e+00 | 2.27e-05 | 7.68e-05 | 3.53e-06 |
| Sm-153 | 2.43e-08 | 2.01e-08 | 1.47e-09 | 0.00e+00 | 6.56e-09 | 7.11e-06 | 1.77e-05 |
| Eu-152 | 2.96e-04 | 7.19e-05 | 6.30e-05 | 0.00e+00 | 3.34e-04 | 5.01e-04 | 1.35e-05 |
| Eu-154 | 9.43e-04 | 1.23e-04 | 8.60e-05 | 0.00e+00 | 5.44e-04 | 9.12e-04 | 3.34e-05 |
| Eu-155 | 2.00e-04 | 1.96e-05 | 1.21e-05 | 0.00e+00 | 7.65e-05 | 1.51e-03 | 5.97e-05 |
| Eu-156 | 2.70e-06 | 2.03e-06 | 3.30e-07 | 0.00e+00 | 1.36e-06 | 1.37e-04 | 4.56e-05 |
| Tb-160 | 3.04e-05 | 0.00e+00 | 3.79e-06 | 0.00e+00 | 1.20e-05 | 2.97e-04 | 2.60e-05 |

Conversion factors are in units of mrem per pCi inhaled.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Teen age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ho-166m | 4.40e-04 | 1.36e-04 | 9.87e-05 | 0.00e+00 | 2.00e-04 | 6.24e-04 | 1.68e-05 |
| W-181 | 8.90e-09 | 2.88e-09 | 3.01e-10 | 0.00e+00 | 0.00e+00 | 2.95e-06 | 2.69e-07 |
| W-185 | 2.78e-07 | 9.17e-08 | 9.73e-09 | 0.00e+00 | 0.00e+00 | 9.60e-05 | 1.14e-05 |
| W-187 | 1.50e-09 | 1.22e-09 | 4.29e-10 | 0.00e+00 | 0.00e+00 | 5.92e-06 | 2.21e-05 |
| Pb-210 | 3.09e-02 | 8.28e-03 | 1.07e-03 | 0.00e+00 | 2.95e-02 | 4.52e-02 | 1.60e-06 |
| Bi-210 | 3.30e-07 | 2.26e-06 | 1.89e-07 | 0.00e+00 | 2.74e-05 | 1.91e-03 | 3.19e-05 |
| Po-210 | 5.68e-04 | 1.22e-03 | 1.37e-04 | 0.00e+00 | 4.21e-03 | 5.41e-02 | 4.45e-05 |
| Ra-223 | 2.57e-04 | 3.93e-07 | 5.14e-05 | 0.00e+00 | 1.12e-05 | 4.39e-02 | 3.04e-04 |
| Ra-224 | 2.83e-05 | 6.77e-08 | 5.65e-06 | 0.00e+00 | 1.93e-06 | 1.51e-02 | 3.29e-04 |
| Ra-225 | 4.28e-04 | 5.04e-07 | 8.56e-05 | 0.00e+00 | 1.44e-05 | 5.04e-02 | 2.89e-04 |
| Ra-226 | 1.33e-01 | 3.38e-06 | 9.87e-02 | 0.00e+00 | 9.67e-05 | 2.02e-01 | 3.11e-04 |
| Ra-228 | 5.34e-02 | 1.74e-06 | 5.88e-02 | 0.00e+00 | 4.97e-05 | 2.78e-01 | 5.30e-05 |
| Ac-225 | 6.04e-04 | 8.25e-04 | 4.06e-05 | 0.00e+00 | 9.47e-05 | 3.81e-02 | 2.70e-04 |
| Ac-227 | 2.49e+00 | 3.69e-01 | 1.48e-01 | 0.00e+00 | 1.07e-01 | 4.16e-01 | 5.38e-05 |
| Th-227 | 3.09e-04 | 5.56e-06 | 8.93e-06 | 0.00e+00 | 3.18e-05 | 6.50e-02 | 3.57e-04 |
| Th-228 | 2.60e-01 | 4.37e-03 | 8.78e-03 | 0.00e+00 | 2.45e-02 | 1.69e+00 | 3.70e-04 |
| Th-229 | 1.54e+01 | 4.44e-01 | 2.56e-01 | 0.00e+00 | 2.18e+00 | 5.24e+00 | 5.12e-05 |
| Th-230 | 2.34e+00 | 1.34e-01 | 6.49e-02 | 0.00e+00 | 6.55e-01 | 8.98e-01 | 3.95e-05 |
| Th-232 | 2.61e+00 | 1.14e-01 | 9.21e-04 | 0.00e+00 | 5.60e-01 | 8.60e-01 | 3.36e-05 |
| Th-234 | 2.32e-06 | 1.35e-07 | 6.71e-08 | 0.00e+00 | 7.73e-07 | 3.26e-04 | 7.49e-05 |
| Pa-231 | 5.32e+00 | 2.00e-01 | 2.07e-01 | 0.00e+00 | 1.12e+00 | 9.91e-02 | 4.71e-05 |
| Pa-233 | 1.68e-06 | 3.24e-07 | 2.89e-07 | 0.00e+00 | 1.22e-06 | 5.39e-05 | 1.00e-05 |
| U-232 | 7.31e-02 | 0.00e+00 | 5.23e-03 | 0.00e+00 | 7.94e-03 | 3.84e-01 | 4.46e-05 |
| U-233 | 1.55e-02 | 0.00e+00 | 9.42e-04 | 0.00e+00 | 3.63e-03 | 9.18e-02 | 4.12e-05 |
| U-234 | 1.48e-02 | 0.00e+00 | 9.23e-04 | 0.00e+00 | 3.55e-03 | 8.99e-02 | 4.04e-05 |
| U-235 | 1.42e-02 | 0.00e+00 | 8.67e-04 | 0.00e+00 | 3.34e-03 | 8.44e-02 | 5.13e-05 |
| U-236 | 1.42e-02 | 0.00e+00 | 8.86e-04 | 0.00e+00 | 3.41e-03 | 8.62e-02 | 3.79e-05 |
| U-237 | 5.25e-08 | 0.00e+00 | 1.40e-08 | 0.00e+00 | 2.16e-07 | 1.76e-05 | 1.29e-05 |
| U-238 | 1.36e-02 | 0.00e+00 | 8.10e-04 | 0.00e+00 | 3.12e-03 | 7.89e-02 | 3.62e-05 |
| Np-237 | 1.64e+00 | 1.06e+00 | 7.21e-02 | 0.00e+00 | 5.35e-01 | 8.99e-02 | 5.22e-05 |

Conversion factors are in units of mrem per pCi inhaled.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Teen age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Np-238 | 4.23e-07 | 1.02e-07 | 6.59e-09 | 0.00e+00 | 3.88e-08 | 1.75e-05 | 2.38e-05 |
| Np-239 | 4.23e-08 | 3.60e-08 | 2.21e-09 | 0.00e+00 | 1.25e-08 | 8.11e-06 | 1.65e-05 |
| Pu-238 | 1.50e+00 | 1.03e+00 | 7.22e-02 | 0.00e+00 | 3.10e-01 | 3.12e-01 | 4.79e-05 |
| Pu-239 | 1.73e+00 | 1.12e+00 | 8.05e-02 | 0.00e+00 | 3.44e-01 | 2.93e-01 | 4.37e-05 |
| Pu-240 | 1.72e+00 | 1.12e+00 | 8.04e-02 | 0.00e+00 | 3.43e-01 | 2.93e-01 | 4.46e-05 |
| Pu-241 | 3.74e-02 | 9.56e-03 | 1.40e-03 | 0.00e+00 | 6.47e-03 | 2.60e-04 | 9.17e-07 |
| Pu-242 | 1.60e+00 | 1.08e+00 | 7.75e-02 | 0.00e+00 | 3.31e-01 | 2.82e-01 | 4.29e-05 |
| Pu-244 | 1.87e+00 | 1.24e+00 | 8.88e-02 | 0.00e+00 | 3.79e-01 | 3.23e-01 | 6.39e-05 |
| Am-241 | 1.77e+00 | 1.20e+00 | 7.10e-02 | 0.00e+00 | 5.32e-01 | 1.05e-01 | 4.88e-05 |
| Am-242m | 1.79e+00 | 1.13e+00 | 7.15e-02 | 0.00e+00 | 5.30e-01 | 4.21e-02 | 6.14e-05 |
| Am-243 | 1.77e+00 | 1.17e+00 | 6.95e-02 | 0.00e+00 | 5.21e-01 | 9.91e-02 | 5.72e-05 |
| Cm-242 | 3.17e-02 | 2.51e-02 | 1.41e-03 | 0.00e+00 | 6.40e-03 | 6.76e-02 | 5.21e-05 |
| Cm-243 | 1.19e+00 | 8.30e-01 | 5.00e-02 | 0.00e+00 | 2.34e-01 | 1.09e-01 | 5.13e-05 |
| Cm-244 | 9.19e-01 | 6.53e-01 | 3.88e-02 | 0.00e+00 | 1.81e-01 | 1.05e-01 | 4.96e-05 |
| Cm-245 | 1.83e+00 | 1.22e+00 | 7.53e-02 | 0.00e+00 | 3.52e-01 | 1.01e-01 | 4.63e-05 |
| Cm-246 | 1.81e+00 | 1.22e+00 | 7.52e-02 | 0.00e+00 | 3.51e-01 | 1.03e-01 | 4.54e-05 |
| Cm-247 | 1.77e+00 | 1.19e+00 | 7.41e-02 | 0.00e+00 | 3.46e-01 | 1.01e-01 | 5.97e-05 |
| Cm-248 | 1.47e+01 | 9.83e+00 | 6.11e-01 | 0.00e+00 | 2.85e+00 | 8.32e-01 | 9.63e-04 |
| Cf-252 | 7.16e-01 | 0.00e+00 | 3.07e-02 | 0.00e+00 | 0.00e+00 | 3.43e-01 | 1.89e-04 |

Conversion factors are in units of mrem per pCi inhaled.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Child age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| H-3 | 0.00e+00 | 1.73e-07 | 1.73e-07 | 1.73e-07 | 1.73e-07 | 1.73e-07 | 1.73e-07 |
| Be-10 | 8.43e-04 | 9.83e-05 | 2.12e-05 | 0.00e+00 | 0.00e+00 | 7.41e-04 | 1.72e-05 |
| C-14 | 9.70e-06 | 1.82e-06 | 1.82e-06 | 1.82e-06 | 1.82e-06 | 1.82e-06 | 1.82e-06 |
| N-13 | 2.33e-08 | 2.33e-08 | 2.33e-08 | 2.33e-08 | 2.33e-08 | 2.33e-08 | 2.33e-08 |
| F-18 | 1.88e-06 | 0.00e+00 | 1.85e-07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.37e-07 |
| Na-22 | 4.41e-05 | 4.41e-05 | 4.41e-05 | 4.41e-05 | 4.41e-05 | 4.41e-05 | 4.41e-05 |
| Na-24 | 4.35e-06 | 4.35e-06 | 4.35e-06 | 4.35e-06 | 4.35e-06 | 4.35e-06 | 4.35e-06 |
| P-32 | 7.04e-04 | 3.09e-05 | 2.67e-05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.14e-05 |
| Ca-41 | 7.06e-05 | 0.00e+00 | 7.70e-06 | 0.00e+00 | 0.00e+00 | 7.21e-02 | 2.94e-07 |
| Sc-46 | 1.97e-04 | 2.70e-04 | 1.04e-04 | 0.00e+00 | 2.39e-04 | 0.00e+00 | 2.45e-05 |
| Cr-51 | 0.00e+00 | 0.00e+00 | 4.17e-08 | 2.31e-08 | 6.57e-09 | 4.59e-06 | 2.93e-07 |
| Mn-54 | 0.00e+00 | 1.16e-05 | 2.57e-06 | 0.00e+00 | 2.71e-06 | 4.26e-04 | 6.19e-06 |
| Mn-56 | 0.00e+00 | 4.48e-10 | 8.43e-11 | 0.00e+00 | 4.52e-10 | 3.55e-06 | 3.33e-05 |
| Fe-55 | 1.28e-05 | 6.80e-06 | 2.10e-06 | 0.00e+00 | 0.00e+00 | 3.00e-05 | 7.75e-07 |
| Fe-59 | 5.59e-06 | 9.04e-06 | 4.51e-06 | 0.00e+00 | 0.00e+00 | 3.43e-04 | 1.91e-05 |
| Co-57 | 0.00e+00 | 2.44e-07 | 2.88e-07 | 0.00e+00 | 0.00e+00 | 1.37e-04 | 3.58e-06 |
| Co-58 | 0.00e+00 | 4.79e-07 | 8.55e-07 | 0.00e+00 | 0.00e+00 | 2.99e-04 | 9.29e-06 |
| Co-60 | 0.00e+00 | 3.55e-06 | 6.12e-06 | 0.00e+00 | 0.00e+00 | 1.91e-03 | 2.60e-05 |
| Ni-59 | 1.66e-05 | 4.67e-06 | 2.83e-06 | 0.00e+00 | 0.00e+00 | 2.73e-05 | 6.29e-07 |
| Ni-63 | 2.22e-04 | 1.25e-05 | 7.56e-06 | 0.00e+00 | 0.00e+00 | 7.43e-05 | 1.71e-06 |
| Ni-65 | 8.08e-10 | 7.99e-11 | 4.44e-11 | 0.00e+00 | 0.00e+00 | 2.21e-06 | 2.27e-05 |
| Cu-64 | 0.00e+00 | 5.39e-10 | 2.90e-10 | 0.00e+00 | 1.63e-09 | 2.59e-06 | 9.92e-06 |
| Zn-65 | 1.15e-05 | 3.06e-05 | 1.90e-05 | 0.00e+00 | 1.93e-05 | 2.69e-04 | 4.41e-06 |
| Zn-69 | 1.81e-11 | 2.61e-11 | 2.41e-12 | 0.00e+00 | 1.58e-11 | 3.84e-07 | 2.75e-06 |
| Zn-69m | 4.26e-09 | 7.28e-09 | 8.59e-10 | 0.00e+00 | 4.22e-09 | 7.36e-06 | 2.71e-05 |
| Se-79 | 0.00e+00 | 1.23e-06 | 2.60e-07 | 0.00e+00 | 1.71e-06 | 1.49e-04 | 3.43e-06 |
| Br-82 | 0.00e+00 | 0.00e+00 | 5.66e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-83 | 0.00e+00 | 0.00e+00 | 1.28e-07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-84 | 0.00e+00 | 0.00e+00 | 1.48e-07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-85 | 0.00e+00 | 0.00e+00 | 6.84e-09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of mrem per pCi inhaled.

Inhalation Dose Conversion factors for Child age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Rb-86 | 0.00e+00 | 5.36e-05 | 3.09e-05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.16e-06 |
| Rb-87 | 0.00e+00 | 3.16e-05 | 1.37e-05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.96e-07 |
| Rb-88 | 0.00e+00 | 1.52e-07 | 9.90e-08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.66e-09 |
| Rb-89 | 0.00e+00 | 9.33e-08 | 7.83e-08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.11e-10 |
| Sr-89 | 1.62e-04 | 0.00e+00 | 4.66e-06 | 0.00e+00 | 0.00e+00 | 5.83e-04 | 4.52e-05 |
| Sr-90 | 1.04e-02 | 0.00e+00 | 2.07e-04 | 0.00e+00 | 0.00e+00 | 3.99e-03 | 9.28e-05 |
| Sr-91 | 3.28e-08 | 0.00e+00 | 1.24e-09 | 0.00e+00 | 0.00e+00 | 1.44e-05 | 4.70e-05 |
| Sr-92 | 3.54e-09 | 0.00e+00 | 1.42e-10 | 0.00e+00 | 0.00e+00 | 6.49e-06 | 6.55e-05 |
| Y-90 | 1.11e-06 | 0.00e+00 | 2.99e-08 | 0.00e+00 | 0.00e+00 | 7.07e-05 | 7.24e-05 |
| Y-91 | 2.47e-04 | 0.00e+00 | 6.59e-06 | 0.00e+00 | 0.00e+00 | 7.10e-04 | 4.97e-05 |
| Y-91m | 1.37e-10 | 0.00e+00 | 4.98e-12 | 0.00e+00 | 0.00e+00 | 7.60e-07 | 4.64e-07 |
| Y-92 | 5.50e-09 | 0.00e+00 | 1.57e-10 | 0.00e+00 | 0.00e+00 | 6.46e-06 | 6.46e-05 |
| Y-93 | 5.04e-08 | 0.00e+00 | 1.38e-09 | 0.00e+00 | 0.00e+00 | 2.01e-05 | 1.05e-04 |
| Zr-93 | 2.07e-04 | 7.80e-06 | 5.55e-06 | 0.00e+00 | 3.00e-05 | 7.10e-05 | 1.47e-06 |
| Zr-95 | 5.13e-05 | 1.13e-05 | 1.00e-05 | 0.00e+00 | 1.61e-05 | 6.03e-04 | 1.65e-05 |
| Zr-97 | 5.07e-08 | 7.34e-09 | 4.32e-09 | 0.00e+00 | 1.05e-08 | 3.06e-05 | 9.49e-05 |
| Nb-93m | 1.27e-04 | 3.17e-05 | 1.04e-05 | 0.00e+00 | 3.44e-05 | 1.04e-04 | 2.45e-06 |
| Nb-95 | 6.35e-06 | 2.48e-06 | 1.77e-06 | 0.00e+00 | 2.33e-06 | 1.66e-04 | 1.00e-05 |
| Nb-97 | 1.16e-10 | 2.08e-11 | 9.74e-12 | 0.00e+00 | 2.31e-11 | 9.23e-07 | 7.52e-06 |
| Mo-93 | 0.00e+00 | 3.76e-06 | 1.35e-07 | 0.00e+00 | 1.06e-06 | 1.70e-04 | 3.78e-06 |
| Mo-99 | 0.00e+00 | 4.66e-08 | 1.15e-08 | 0.00e+00 | 1.06e-07 | 3.66e-05 | 3.42e-05 |
| Tc-101 | 2.19e-14 | 2.30e-14 | 2.91e-13 | 0.00e+00 | 3.92e-13 | 1.58e-07 | 4.41e-09 |
| Tc-99 | 1.34e-07 | 1.49e-07 | 5.35e-08 | 0.00e+00 | 1.75e-06 | 3.37e-04 | 7.75e-06 |
| Tc-99m | 4.81e-13 | 9.41e-13 | 1.56e-11 | 0.00e+00 | 1.37e-11 | 2.57e-07 | 1.30e-06 |
| Ru-103 | 7.55e-07 | 0.00e+00 | 2.90e-07 | 0.00e+00 | 1.90e-06 | 1.79e-04 | 1.21e-05 |
| Ru-105 | 4.13e-10 | 0.00e+00 | 1.50e-10 | 0.00e+00 | 3.63e-10 | 4.30e-06 | 2.69e-05 |
| Ru-106 | 3.68e-05 | 0.00e+00 | 4.57e-06 | 0.00e+00 | 4.97e-05 | 3.87e-03 | 1.16e-04 |
| Rh-105 | 3.91e-09 | 2.10e-09 | 1.79e-09 | 0.00e+00 | 8.39e-09 | 7.82e-06 | 1.33e-05 |
| Pd-107 | 0.00e+00 | 2.65e-07 | 2.51e-08 | 0.00e+00 | 1.97e-06 | 3.16e-05 | 7.26e-07 |
| Pd-109 | 0.00e+00 | 1.48e-09 | 4.95e-10 | 0.00e+00 | 7.06e-09 | 6.16e-06 | 2.59e-05 |

Conversion factors are in units of mrem per pCi inhaled.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Child age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ag-110m | 4.56e-06 | 3.08e-06 | 2.47e-06 | 0.00e+00 | 5.74e-06 | 1.48e-03 | 2.71e-05 |
| Ag-111 | 1.81e-07 | 5.68e-08 | 3.75e-08 | 0.00e+00 | 1.71e-07 | 7.73e-05 | 2.98e-05 |
| Cd-113m | 0.00e+00 | 4.93e-04 | 2.12e-05 | 0.00e+00 | 5.13e-04 | 6.94e-04 | 1.63e-05 |
| Cd-115m | 0.00e+00 | 7.88e-05 | 3.39e-06 | 0.00e+00 | 5.93e-05 | 5.86e-04 | 4.97e-05 |
| Sn-123 | 1.29e-04 | 2.14e-06 | 4.19e-06 | 2.27e-06 | 0.00e+00 | 9.59e-04 | 4.05e-05 |
| Sn-125 | 4.95e-06 | 9.94e-08 | 2.95e-07 | 1.03e-07 | 0.00e+00 | 2.43e-04 | 7.17e-05 |
| Sn-126 | 6.23e-04 | 1.04e-05 | 2.36e-05 | 2.84e-06 | 0.00e+00 | 3.02e-03 | 1.63e-05 |
| Sb-124 | 1.55e-05 | 2.00e-07 | 5.41e-06 | 3.41e-08 | 0.00e+00 | 8.76e-04 | 4.43e-05 |
| Sb-125 | 2.66e-05 | 2.05e-07 | 5.59e-06 | 2.46e-08 | 0.00e+00 | 6.27e-04 | 1.09e-05 |
| Sb-126 | 1.72e-06 | 2.62e-08 | 6.16e-07 | 1.00e-08 | 0.00e+00 | 2.86e-04 | 5.67e-05 |
| Sb-127 | 1.36e-07 | 2.09e-09 | 4.70e-08 | 1.51e-09 | 0.00e+00 | 6.17e-05 | 3.82e-05 |
| Te-125m | 1.82e-06 | 6.29e-07 | 2.47e-07 | 5.20e-07 | 0.00e+00 | 1.29e-04 | 9.13e-06 |
| Te-127 | 7.49e-10 | 2.57e-10 | 1.65e-10 | 5.30e-10 | 1.91e-09 | 2.71e-06 | 1.52e-05 |
| Te-127m | 6.72e-06 | 2.31e-06 | 8.16e-07 | 1.64e-06 | 1.72e-05 | 4.00e-04 | 1.93e-05 |
| Te-129 | 2.64e-11 | 9.45e-12 | 6.44e-12 | 1.93e-11 | 6.94e-11 | 7.93e-07 | 6.89e-06 |
| Te-129m | 5.19e-06 | 1.85e-06 | 8.22e-07 | 1.71e-06 | 1.36e-05 | 4.76e-04 | 4.91e-05 |
| Te-131 | 5.87e-12 | 2.28e-12 | 1.78e-12 | 4.59e-12 | 1.59e-11 | 5.55e-07 | 3.60e-07 |
| Te-131m | 3.63e-08 | 1.60e-08 | 1.37e-08 | 2.64e-08 | 1.08e-07 | 5.56e-05 | 8.32e-05 |
| Te-132 | 1.30e-07 | 7.36e-08 | 7.12e-08 | 8.58e-08 | 4.79e-07 | 1.02e-04 | 3.72e-05 |
| Te-133m | 2.93e-11 | 1.51e-11 | 1.50e-11 | 2.32e-11 | 1.01e-10 | 1.60e-06 | 4.77e-06 |
| Te-134 | 1.53e-11 | 8.81e-12 | 9.40e-12 | 1.24e-11 | 5.71e-11 | 1.23e-06 | 4.87e-07 |
| I-129 | 1.05e-05 | 6.40e-06 | 5.71e-06 | 4.28e-03 | 1.08e-05 | 0.00e+00 | 2.15e-07 |
| I-130 | 2.21e-06 | 4.43e-06 | 2.28e-06 | 4.99e-04 | 6.61e-06 | 0.00e+00 | 1.38e-06 |
| I-131 | 1.30e-05 | 1.30e-05 | 7.37e-06 | 4.39e-03 | 2.13e-05 | 0.00e+00 | 7.68e-07 |
| I-132 | 5.72e-07 | 1.10e-06 | 5.07e-07 | 5.23e-05 | 1.69e-06 | 0.00e+00 | 8.65e-07 |
| I-133 | 4.48e-06 | 5.49e-06 | 2.08e-06 | 1.04e-03 | 9.13e-06 | 0.00e+00 | 1.48e-06 |
| I-134 | 3.17e-07 | 5.84e-07 | 2.69e-07 | 1.37e-05 | 8.92e-07 | 0.00e+00 | 2.58e-07 |
| I-135 | 1.33e-06 | 2.36e-06 | 1.12e-06 | 2.14e-04 | 3.62e-06 | 0.00e+00 | 1.20e-06 |
| Cs-134 | 1.76e-04 | 2.74e-04 | 6.07e-05 | 0.00e+00 | 8.93e-05 | 3.27e-05 | 1.04e-06 |
| Cs-134m | 6.33e-08 | 8.92e-08 | 6.12e-08 | 0.00e+00 | 4.94e-08 | 8.35e-09 | 7.92e-08 |

Conversion factors are in units of mrem per pCi inhaled.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Child age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Cs-135 | 6.23e-05 | 4.13e-05 | 4.45e-06 | 0.00e+00 | 1.53e-05 | 5.22e-06 | 2.17e-07 |
| Cs-136 | 1.76e-05 | 4.62e-05 | 3.14e-05 | 0.00e+00 | 2.58e-05 | 3.93e-06 | 1.13e-06 |
| Cs-137 | 2.45e-04 | 2.23e-04 | 3.47e-05 | 0.00e+00 | 7.63e-05 | 2.81e-05 | 9.78e-07 |
| Cs-138 | 1.71e-07 | 2.27e-07 | 1.50e-07 | 0.00e+00 | 1.68e-07 | 1.84e-08 | 7.29e-08 |
| Cs-139 | 1.09e-07 | 1.15e-07 | 5.80e-08 | 0.00e+00 | 9.08e-08 | 9.36e-09 | 7.23e-12 |
| Ba-139 | 4.98e-10 | 2.66e-13 | 1.45e-11 | 0.00e+00 | 2.33e-13 | 1.56e-06 | 1.56e-05 |
| Ba-140 | 2.00e-05 | 1.75e-08 | 1.17e-06 | 0.00e+00 | 5.71e-09 | 4.71e-04 | 2.75e-05 |
| Ba-141 | 5.29e-11 | 2.95e-14 | 1.72e-12 | 0.00e+00 | 2.56e-14 | 7.89e-07 | 7.44e-08 |
| Ba-142 | 1.35e-11 | 9.73e-15 | 7.54e-13 | 0.00e+00 | 7.87e-15 | 4.44e-07 | 7.41e-10 |
| La-140 | 1.74e-07 | 6.08e-08 | 2.04e-08 | 0.00e+00 | 0.00e+00 | 4.94e-05 | 6.10e-05 |
| La-141 | 2.28e-09 | 5.31e-10 | 1.15e-10 | 0.00e+00 | 0.00e+00 | 4.48e-06 | 4.37e-05 |
| La-142 | 3.50e-10 | 1.11e-10 | 3.49e-11 | 0.00e+00 | 0.00e+00 | 2.35e-06 | 2.05e-05 |
| Ce-141 | 1.06e-05 | 5.28e-06 | 7.83e-07 | 0.00e+00 | 2.31e-06 | 1.47e-04 | 1.53e-05 |
| Ce-143 | 9.89e-08 | 5.37e-08 | 7.77e-09 | 0.00e+00 | 2.26e-08 | 3.12e-05 | 3.44e-05 |
| Ce-144 | 1.83e-03 | 5.72e-04 | 9.77e-05 | 0.00e+00 | 3.17e-04 | 3.23e-03 | 1.05e-04 |
| Pr-143 | 4.99e-06 | 1.50e-06 | 2.47e-07 | 0.00e+00 | 8.11e-07 | 1.17e-04 | 2.63e-05 |
| Pr-144 | 1.61e-11 | 4.99e-12 | 8.10e-13 | 0.00e+00 | 2.64e-12 | 4.23e-07 | 5.32e-08 |
| Nd-147 | 2.92e-06 | 2.36e-06 | 1.84e-07 | 0.00e+00 | 1.30e-06 | 8.87e-05 | 2.22e-05 |
| Pm-147 | 3.52e-04 | 2.52e-05 | 1.36e-05 | 0.00e+00 | 4.45e-05 | 2.20e-04 | 5.70e-06 |
| Pm-148 | 1.61e-06 | 1.94e-07 | 1.25e-07 | 0.00e+00 | 3.30e-07 | 1.24e-04 | 6.01e-05 |
| Pm-148m | 3.31e-05 | 6.55e-06 | 6.55e-06 | 0.00e+00 | 9.74e-06 | 5.72e-04 | 3.58e-05 |
| Pm-149 | 1.47e-07 | 1.56e-08 | 8.45e-09 | 0.00e+00 | 2.75e-08 | 2.40e-05 | 2.92e-05 |
| Pm-151 | 3.57e-08 | 4.33e-09 | 2.82e-09 | 0.00e+00 | 7.35e-09 | 1.24e-05 | 2.50e-05 |
| Sm-151 | 3.14e-04 | 4.75e-05 | 1.49e-05 | 0.00e+00 | 4.89e-05 | 1.48e-04 | 3.43e-06 |
| Sm-153 | 7.24e-08 | 4.51e-08 | 4.35e-09 | 0.00e+00 | 1.37e-08 | 1.37e-05 | 1.87e-05 |
| Eu-152 | 7.42e-04 | 1.37e-04 | 1.61e-04 | 0.00e+00 | 5.73e-04 | 9.00e-04 | 1.14e-05 |
| Eu-154 | 2.74e-03 | 2.49e-04 | 2.27e-04 | 0.00e+00 | 1.09e-03 | 1.66e-03 | 2.98e-05 |
| Eu-155 | 5.60e-04 | 4.05e-05 | 3.18e-05 | 0.00e+00 | 1.51e-04 | 2.79e-04 | 5.39e-05 |
| Eu-156 | 7.89e-06 | 4.23e-06 | 8.75e-07 | 0.00e+00 | 2.72e-06 | 2.54e-04 | 4.24e-05 |
| Tb-160 | 7.79e-05 | 0.00e+00 | 9.67e-06 | 0.00e+00 | 2.32e-05 | 5.34e-04 | 2.28e-05 |

Conversion factors are in units of mrem per pCi inhaled.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Child age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ho-166m | 1.34e-03 | 2.81e-04 | 2.37e-04 | 0.00e+00 | 4.01e-04 | 1.13e-03 | 1.63e-05 |
| W-181 | 2.66e-08 | 6.52e-09 | 8.99e-10 | 0.00e+00 | 0.00e+00 | 5.71e-06 | 2.61e-07 |
| W-185 | 8.31e-07 | 2.08e-07 | 2.91e-08 | 0.00e+00 | 0.00e+00 | 1.86e-04 | 1.11e-05 |
| W-187 | 4.41e-09 | 2.61e-09 | 1.17e-09 | 0.00e+00 | 0.00e+00 | 1.11e-05 | 2.46e-05 |
| Pb-210 | 8.03e-02 | 1.85e-02 | 3.18e-03 | 0.00e+00 | 6.31e-02 | 8.74e-02 | 1.55e-06 |
| Bi-210 | 9.85e-07 | 5.11e-06 | 5.65e-07 | 0.00e+00 | 5.76e-05 | 3.70e-03 | 3.21e-05 |
| Po-210 | 1.70e-03 | 2.76e-03 | 4.09e-04 | 0.00e+00 | 8.85e-03 | 1.05e-01 | 4.32e-05 |
| Ra-223 | 7.69e-04 | 8.89e-07 | 1.54e-04 | 0.00e+00 | 2.36e-05 | 8.48e-02 | 3.00e-04 |
| Ra-224 | 8.44e-05 | 1.53e-07 | 1.69e-05 | 0.00e+00 | 4.06e-06 | 2.92e-02 | 3.34e-04 |
| Ra-225 | 1.28e-03 | 1.14e-06 | 2.56e-04 | 0.00e+00 | 3.02e-05 | 9.74e-02 | 2.84e-04 |
| Ra-226 | 2.34e-01 | 7.66e-06 | 1.92e-01 | 0.00e+00 | 2.03e-04 | 3.90e-01 | 3.02e-04 |
| Ra-228 | 1.49e-01 | 3.94e-06 | 1.68e-01 | 0.00e+00 | 1.04e-04 | 5.37e-01 | 5.14e-05 |
| Ac-225 | 1.81e-03 | 1.87e-03 | 1.21e-04 | 0.00e+00 | 1.99e-04 | 7.37e-02 | 2.67e-04 |
| Ac-227 | 4.96e+00 | 8.05e-01 | 3.07e-01 | 0.00e+00 | 1.77e-01 | 8.04e-01 | 5.22e-05 |
| Th-227 | 9.24e-04 | 1.26e-05 | 2.67e-05 | 0.00e+00 | 6.67e-05 | 1.26e-01 | 3.49e-04 |
| Th-228 | 8.06e-01 | 1.04e-02 | 2.72e-02 | 0.00e+00 | 5.41e-02 | 3.34e+00 | 3.59e-04 |
| Th-229 | 2.18e+01 | 5.74e-01 | 3.63e-01 | 0.00e+00 | 2.83e+00 | 1.08e+01 | 4.99e-05 |
| Th-230 | 3.30e+00 | 1.73e-01 | 9.20e-02 | 0.00e+00 | 8.52e-01 | 1.85e+00 | 3.84e-05 |
| Th-232 | 3.68e+00 | 1.47e-01 | 1.28e-03 | 0.00e+00 | 7.28e-01 | 1.77e+00 | 3.27e-05 |
| Th-234 | 6.94e-06 | 3.07e-07 | 2.00e-07 | 0.00e+00 | 1.62e-06 | 6.31e-04 | 7.32e-05 |
| Pa-231 | 8.62e+00 | 2.86e-01 | 3.43e-01 | 0.00e+00 | 1.56e+00 | 1.92e-01 | 4.57e-05 |
| Pa-233 | 4.14e-06 | 6.48e-07 | 7.25e-07 | 0.00e+00 | 2.38e-06 | 9.77e-05 | 8.95e-06 |
| U-232 | 2.19e-01 | 0.00e+00 | 1.56e-02 | 0.00e+00 | 1.67e-02 | 7.42e-01 | 4.33e-05 |
| U-233 | 4.64e-02 | 0.00e+00 | 2.82e-03 | 0.00e+00 | 7.62e-03 | 1.77e-01 | 4.00e-05 |
| U-234 | 4.46e-02 | 0.00e+00 | 2.76e-03 | 0.00e+00 | 7.47e-03 | 1.74e-01 | 3.92e-05 |
| U-235 | 4.27e-02 | 0.00e+00 | 2.59e-03 | 0.00e+00 | 7.01e-03 | 1.63e-01 | 4.98e-05 |
| U-236 | 4.27e-02 | 0.00e+00 | 2.65e-03 | 0.00e+00 | 7.16e-03 | 1.67e-01 | 3.67e-05 |
| U-237 | 1.57e-07 | 0.00e+00 | 4.17e-08 | 0.00e+00 | 4.53e-07 | 3.40e-05 | 1.29e-05 |
| U-238 | 4.09e-02 | 0.00e+00 | 2.42e-03 | 0.00e+00 | 6.55e-03 | 1.53e-01 | 3.51e-05 |
| Np-237 | 2.72e+00 | 1.62e+00 | 1.19e-01 | 0.00e+00 | 7.41e-01 | 1.74e-01 | 5.06e-05 |

Conversion factors are in units of mrem per pCi inhaled.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Child age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Np-238 | 1.26e-06 | 2.30e-07 | 1.97e-08 | 0.00e+00 | 8.16e-08 | 3.39e-05 | 2.50e-05 |
| Np-239 | 1.26e-07 | 8.14e-08 | 6.35e-09 | 0.00e+00 | 2.63e-08 | 1.57e-05 | 1.73e-05 |
| Pu-238 | 2.55e+00 | 1.60e+00 | 1.21e-01 | 0.00e+00 | 4.47e-01 | 6.08e-01 | 4.65e-05 |
| Pu-239 | 2.79e+00 | 1.68e+00 | 1.28e-01 | 0.00e+00 | 4.78e-01 | 5.72e-01 | 4.24e-05 |
| Pu-240 | 2.79e+00 | 1.68e+00 | 1.27e-01 | 0.00e+00 | 4.77e-01 | 5.71e-01 | 4.33e-05 |
| Pu-241 | 7.94e-02 | 1.75e-02 | 2.93e-03 | 0.00e+00 | 1.10e-02 | 5.06e-04 | 8.90e-07 |
| Pu-242 | 2.59e+00 | 1.62e+00 | 1.23e-01 | 0.00e+00 | 4.60e-01 | 5.50e-01 | 4.16e-05 |
| Pu-244 | 3.02e+00 | 1.85e+00 | 1.41e-01 | 0.00e+00 | 5.27e-01 | 6.30e-01 | 6.20e-05 |
| Am-241 | 2.97e+00 | 1.84e+00 | 1.24e-01 | 0.00e+00 | 7.63e-01 | 2.02e-01 | 4.73e-05 |
| Am-242m | 3.07e+00 | 1.76e+00 | 1.27e-01 | 0.00e+00 | 7.71e-01 | 8.14e-02 | 5.96e-05 |
| Am-243 | 2.94e+00 | 1.78e+00 | 1.20e-01 | 0.00e+00 | 7.42e-01 | 1.92e-01 | 5.55e-05 |
| Cm-242 | 9.48e-02 | 5.68e-02 | 4.20e-03 | 0.00e+00 | 1.34e-02 | 1.31e-01 | 5.06e-05 |
| Cm-243 | 2.32e+00 | 1.42e+00 | 9.95e-02 | 0.00e+00 | 3.74e-01 | 2.10e-01 | 4.98e-05 |
| Cm-244 | 1.94e+00 | 1.18e+00 | 8.31e-02 | 0.00e+00 | 3.06e-01 | 2.02e-01 | 4.82e-05 |
| Cm-245 | 3.05e+00 | 1.84e+00 | 1.28e-01 | 0.00e+00 | 5.03e-01 | 1.95e-01 | 4.49e-05 |
| Cm-246 | 3.02e+00 | 1.84e+00 | 1.28e-01 | 0.00e+00 | 5.03e-01 | 1.99e-01 | 4.41e-05 |
| Cm-247 | 2.94e+00 | 1.82e+00 | 1.26e-01 | 0.00e+00 | 4.95e-01 | 1.95e-01 | 5.80e-05 |
| Cm-248 | 2.45e+01 | 1.50e+01 | 1.04e+00 | 0.00e+00 | 4.08e+00 | 1.61e+00 | 9.35e-04 |
| Cf-252 | 2.18e+00 | 0.00e+00 | 9.33e-02 | 0.00e+00 | 0.00e+00 | 6.62e-01 | 1.84e-04 |

Conversion factors are in units of mrem per pCi inhaled.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Infant age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| H-3 | 0.00e+00 | 2.63e-07 | 2.63e-07 | 2.63e-07 | 2.63e-07 | 2.63e-07 | 2.63e-07 |
| Be-10 | 9.49e-04 | 1.25e-04 | 2.65e-05 | 0.00e+00 | 0.00e+00 | 1.49e-03 | 1.73e-05 |
| C-14 | 1.89e-05 | 3.79e-06 | 3.79e-06 | 3.79e-06 | 3.79e-06 | 3.79e-06 | 3.79e-06 |
| N-13 | 4.39e-08 | 4.39e-08 | 4.39e-08 | 4.39e-08 | 4.39e-08 | 4.39e-08 | 4.39e-08 |
| F-18 | 3.92e-06 | 0.00e+00 | 3.33e-07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.10e-07 |
| Na-22 | 7.37e-05 | 7.37e-05 | 7.37e-05 | 7.37e-05 | 7.37e-05 | 7.37e-05 | 7.37e-05 |
| Na-24 | 7.54e-06 | 7.54e-06 | 7.54e-06 | 7.54e-06 | 7.54e-06 | 7.54e-06 | 7.54e-06 |
| P-32 | 1.45e-03 | 8.03e-05 | 5.53e-05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.15e-05 |
| Ca-41 | 7.48e-05 | 0.00e+00 | 8.16e-06 | 0.00e+00 | 0.00e+00 | 6.94e-02 | 2.96e-07 |
| Sc-46 | 3.75e-04 | 5.41e-04 | 1.69e-04 | 0.00e+00 | 3.56e-04 | 0.00e+00 | 2.19e-05 |
| Cr-51 | 0.00e+00 | 0.00e+00 | 6.39e-08 | 4.11e-08 | 9.45e-09 | 9.17e-06 | 2.55e-07 |
| Mn-54 | 0.00e+00 | 1.81e-05 | 3.56e-06 | 0.00e+00 | 3.56e-06 | 7.14e-04 | 5.04e-06 |
| Mn-56 | 0.00e+00 | 1.10e-09 | 1.58e-10 | 0.00e+00 | 7.86e-10 | 8.95e-06 | 5.12e-05 |
| Fe-55 | 1.41e-05 | 8.39e-06 | 2.38e-06 | 0.00e+00 | 0.00e+00 | 6.21e-05 | 7.82e-07 |
| Fe-59 | 9.69e-06 | 1.68e-05 | 6.77e-06 | 0.00e+00 | 0.00e+00 | 7.25e-04 | 1.77e-05 |
| Co-57 | 0.00e+00 | 4.65e-07 | 4.58e-07 | 0.00e+00 | 0.00e+00 | 2.71e-04 | 3.47e-06 |
| Co-58 | 0.00e+00 | 8.71e-07 | 1.30e-06 | 0.00e+00 | 0.00e+00 | 5.55e-04 | 7.95e-06 |
| Co-60 | 0.00e+00 | 5.73e-06 | 8.41e-06 | 0.00e+00 | 0.00e+00 | 3.22e-03 | 2.28e-05 |
| Ni-59 | 1.81e-05 | 5.44e-06 | 3.10e-06 | 0.00e+00 | 0.00e+00 | 5.48e-05 | 6.34e-07 |
| Ni-63 | 2.42e-04 | 1.46e-05 | 8.29e-06 | 0.00e+00 | 0.00e+00 | 1.49e-04 | 1.73e-06 |
| Ni-65 | 1.71e-09 | 2.03e-10 | 8.79e-11 | 0.00e+00 | 0.00e+00 | 5.80e-06 | 3.58e-05 |
| Cu-64 | 0.00e+00 | 1.34e-09 | 5.53e-10 | 0.00e+00 | 2.84e-09 | 6.64e-06 | 1.07e-05 |
| Zn-65 | 1.38e-05 | 4.47e-05 | 2.22e-05 | 0.00e+00 | 2.32e-05 | 4.62e-04 | 3.67e-05 |
| Zn-69 | 3.85e-11 | 6.91e-11 | 5.13e-12 | 0.00e+00 | 2.87e-11 | 1.05e-06 | 9.44e-06 |
| Zn-69m | 8.98e-09 | 1.84e-08 | 1.67e-09 | 0.00e+00 | 7.45e-09 | 1.91e-05 | 2.92e-05 |
| Se-79 | 0.00e+00 | 2.25e-06 | 4.20e-07 | 0.00e+00 | 2.47e-06 | 2.99e-04 | 3.46e-06 |
| Br-82 | 0.00e+00 | 0.00e+00 | 9.49e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-83 | 0.00e+00 | 0.00e+00 | 2.72e-07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-84 | 0.00e+00 | 0.00e+00 | 2.86e-07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-85 | 0.00e+00 | 0.00e+00 | 1.46e-08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of mrem per pCi inhaled.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Infant age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Rb-86 | 0.00e+00 | 1.36e-04 | 6.30e-05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.17e-06 |
| Rb-87 | 0.00e+00 | 7.11e-05 | 2.64e-05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.99e-07 |
| Rb-88 | 0.00e+00 | 3.98e-07 | 2.05e-07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.42e-07 |
| Rb-89 | 0.00e+00 | 2.29e-07 | 1.47e-07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.87e-08 |
| Sr-89 | 2.84e-04 | 0.00e+00 | 8.15e-06 | 0.00e+00 | 0.00e+00 | 1.45e-03 | 4.57e-05 |
| Sr-90 | 1.11e-02 | 0.00e+00 | 2.23e-04 | 0.00e+00 | 0.00e+00 | 8.03e-03 | 9.36e-05 |
| Sr-91 | 6.83e-08 | 0.00e+00 | 2.47e-09 | 0.00e+00 | 0.00e+00 | 3.76e-05 | 5.24e-05 |
| Sr-92 | 7.50e-09 | 0.00e+00 | 2.79e-10 | 0.00e+00 | 0.00e+00 | 1.70e-05 | 1.00e-04 |
| Y-90 | 2.35e-06 | 0.00e+00 | 6.30e-08 | 0.00e+00 | 0.00e+00 | 1.92e-04 | 7.43e-05 |
| Y-91 | 4.20e-04 | 0.00e+00 | 1.12e-05 | 0.00e+00 | 0.00e+00 | 1.75e-03 | 5.02e-05 |
| Y-91m | 2.91e-10 | 0.00e+00 | 9.90e-12 | 0.00e+00 | 0.00e+00 | 1.99e-06 | 1.68e-06 |
| Y-92 | 1.17e-08 | 0.00e+00 | 3.29e-10 | 0.00e+00 | 0.00e+00 | 1.75e-05 | 9.04e-05 |
| Y-93 | 1.07e-07 | 0.00e+00 | 2.91e-09 | 0.00e+00 | 0.00e+00 | 5.46e-05 | 1.19e-04 |
| Zr-93 | 2.24e-04 | 9.51e-06 | 6.18e-06 | 0.00e+00 | 3.19e-05 | 1.37e-04 | 1.48e-06 |
| Zr-95 | 8.24e-05 | 1.99e-05 | 1.45e-05 | 0.00e+00 | 2.22e-05 | 1.25e-03 | 1.55e-05 |
| Zr-97 | 1.07e-07 | 1.83e-08 | 8.36e-09 | 0.00e+00 | 1.85e-08 | 7.88e-05 | 1.00e-04 |
| Nb-93m | 1.38e-04 | 3.59e-05 | 1.15e-05 | 0.00e+00 | 3.68e-05 | 2.09e-04 | 2.47e-06 |
| Nb-95 | 1.12e-05 | 4.59e-06 | 2.70e-06 | 0.00e+00 | 3.37e-06 | 3.42e-04 | 9.05e-06 |
| Nb-97 | 2.44e-10 | 5.21e-11 | 1.88e-11 | 0.00e+00 | 4.07e-11 | 2.37e-06 | 1.92e-05 |
| Mo-93 | 0.00e+00 | 6.46e-06 | 2.22e-07 | 0.00e+00 | 1.54e-06 | 3.40e-04 | 3.76e-06 |
| Mo-99 | 0.00e+00 | 1.18e-07 | 2.31e-08 | 0.00e+00 | 1.89e-07 | 9.63e-05 | 3.48e-05 |
| Tc-101 | 4.65e-14 | 5.88e-14 | 5.80e-13 | 0.00e+00 | 6.99e-13 | 4.17e-07 | 6.03e-07 |
| Tc-99 | 2.09e-07 | 2.68e-07 | 8.85e-08 | 0.00e+00 | 2.49e-06 | 6.77e-04 | 7.82e-06 |
| Tc-99m | 9.98e-13 | 2.06e-12 | 2.66e-11 | 0.00e+00 | 2.22e-11 | 5.79e-07 | 1.45e-06 |
| Ru-103 | 1.44e-06 | 0.00e+00 | 4.85e-07 | 0.00e+00 | 3.03e-06 | 3.94e-04 | 1.15e-05 |
| Ru-105 | 8.74e-10 | 0.00e+00 | 2.93e-10 | 0.00e+00 | 6.42e-10 | 1.12e-05 | 3.46e-05 |
| Ru-106 | 6.20e-05 | 0.00e+00 | 7.77e-06 | 0.00e+00 | 7.61e-05 | 8.26e-03 | 1.17e-04 |
| Rh-105 | 8.26e-09 | 5.41e-09 | 3.63e-09 | 0.00e+00 | 1.50e-08 | 2.08e-05 | 1.37e-05 |
| Pd-107 | 0.00e+00 | 4.92e-07 | 4.11e-08 | 0.00e+00 | 2.75e-06 | 6.34e-05 | 7.33e-07 |
| Pd-109 | 0.00e+00 | 3.92e-09 | 1.05e-09 | 0.00e+00 | 1.28e-08 | 1.68e-05 | 2.85e-05 |

Conversion factors are in units of mrem per pCi inhaled.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Infant age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ag-110m | 7.13e-06 | 5.16e-06 | 3.57e-06 | 0.00e+00 | 7.80e-06 | 2.62e-03 | 2.36e-05 |
| Ag-111 | 3.75e-07 | 1.45e-07 | 7.75e-08 | 0.00e+00 | 3.05e-07 | 2.06e-04 | 3.02e-05 |
| Cd-113m | 0.00e+00 | 6.67e-04 | 2.64e-05 | 0.00e+00 | 5.80e-04 | 1.40e-03 | 1.65e-05 |
| Cd-115m | 0.00e+00 | 1.73e-04 | 6.19e-06 | 0.00e+00 | 9.41e-05 | 1.47e-03 | 5.02e-05 |
| Sn-123 | 2.09e-04 | 4.21e-06 | 7.28e-06 | 4.27e-06 | 0.00e+00 | 2.22e-03 | 4.08e-05 |
| Sn-125 | 1.01e-05 | 2.51e-07 | 6.00e-07 | 2.47e-07 | 0.00e+00 | 6.43e-04 | 7.26e-05 |
| Sn-126 | 8.30e-04 | 1.44e-05 | 3.52e-05 | 3.84e-06 | 0.00e+00 | 4.93e-03 | 1.65e-05 |
| Sb-124 | 2.71e-05 | 3.97e-07 | 8.56e-06 | 7.18e-08 | 0.00e+00 | 1.89e-03 | 4.22e-05 |
| Sb-125 | 3.69e-05 | 3.41e-07 | 7.78e-06 | 4.45e-08 | 0.00e+00 | 1.17e-03 | 1.05e-05 |
| Sb-126 | 3.08e-06 | 6.01e-08 | 1.11e-06 | 2.35e-08 | 0.00e+00 | 6.88e-04 | 5.33e-05 |
| Sb-127 | 2.82e-07 | 5.04e-09 | 8.76e-08 | 3.60e-09 | 0.00e+00 | 1.54e-04 | 3.78e-05 |
| Te-125m | 3.40e-06 | 1.42e-06 | 4.70e-07 | 1.16e-06 | 0.00e+00 | 3.19e-04 | 9.22e-06 |
| Te-127 | 1.59e-09 | 6.81e-10 | 3.49e-10 | 1.32e-09 | 3.47e-09 | 7.39e-06 | 1.74e-05 |
| Te-127m | 1.19e-05 | 4.93e-06 | 1.48e-06 | 3.48e-06 | 2.68e-05 | 9.37e-04 | 1.95e-05 |
| Te-129 | 5.63e-11 | 2.48e-11 | 1.34e-11 | 4.82e-11 | 1.25e-10 | 2.14e-06 | 1.88e-05 |
| Te-129m | 1.01e-05 | 4.35e-06 | 1.59e-06 | 3.91e-06 | 2.27e-05 | 1.20e-03 | 4.93e-05 |
| Te-131 | 1.24e-11 | 5.87e-12 | 3.57e-12 | 1.13e-11 | 2.85e-11 | 1.47e-06 | 5.87e-06 |
| Te-131m | 7.62e-08 | 3.93e-08 | 2.59e-08 | 6.38e-08 | 1.89e-07 | 1.42e-04 | 8.51e-05 |
| Te-132 | 2.66e-07 | 1.69e-07 | 1.26e-07 | 1.99e-07 | 7.39e-07 | 2.43e-04 | 3.15e-05 |
| Te-133m | 6.13e-11 | 3.59e-11 | 2.74e-11 | 5.52e-11 | 1.72e-10 | 3.92e-06 | 1.59e-05 |
| Te-134 | 3.18e-11 | 2.04e-11 | 1.68e-11 | 2.91e-11 | 9.59e-11 | 2.93e-06 | 2.53e-06 |
| I-129 | 2.16e-05 | 1.59e-05 | 1.16e-05 | 1.04e-02 | 1.88e-05 | 0.00e+00 | 2.12e-07 |
| I-130 | 4.54e-06 | 9.91e-06 | 3.98e-06 | 1.14e-03 | 1.09e-05 | 0.00e+00 | 1.42e-06 |
| I-131 | 2.71e-05 | 3.17e-05 | 1.40e-05 | 1.06e-02 | 3.70e-05 | 0.00e+00 | 7.56e-07 |
| I-132 | 1.21e-06 | 2.53e-06 | 8.99e-07 | 1.21e-04 | 2.82e-06 | 0.00e+00 | 1.36e-06 |
| I-133 | 9.46e-06 | 1.37e-05 | 4.00e-06 | 2.54e-03 | 1.60e-05 | 0.00e+00 | 1.54e-06 |
| I-134 | 6.58e-07 | 1.34e-06 | 4.75e-07 | 3.18e-05 | 1.49e-06 | 0.00e+00 | 9.21e-07 |
| I-135 | 2.76e-06 | 5.43e-06 | 1.98e-06 | 4.97e-04 | 6.05e-06 | 0.00e+00 | 1.31e-06 |
| Cs-134 | 2.83e-04 | 5.02e-04 | 5.32e-05 | 0.00e+00 | 1.36e-04 | 5.69e-05 | 9.53e-07 |
| Cs-134m | 1.32e-07 | 2.10e-07 | 1.11e-07 | 0.00e+00 | 8.50e-08 | 2.00e-08 | 1.16e-07 |

Conversion factors are in units of mrem per pCi inhaled.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Infant age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Cs-135 | 1.00e-04 | 8.66e-05 | 4.73e-06 | 0.00e+00 | 2.58e-05 | 1.01e-05 | 2.18e-07 |
| Cs-136 | 3.45e-05 | 9.61e-05 | 3.78e-05 | 0.00e+00 | 4.03e-05 | 8.40e-06 | 1.02e-06 |
| Cs-137 | 3.92e-04 | 4.37e-04 | 3.25e-05 | 0.00e+00 | 1.23e-04 | 5.09e-05 | 9.53e-07 |
| Cs-138 | 3.61e-07 | 5.58e-07 | 2.84e-07 | 0.00e+00 | 2.93e-07 | 4.67e-08 | 6.26e-07 |
| Cs-139 | 2.32e-07 | 3.03e-07 | 1.22e-07 | 0.00e+00 | 1.65e-07 | 2.53e-08 | 1.33e-08 |
| Ba-139 | 1.06e-09 | 7.03e-13 | 3.07e-11 | 0.00e+00 | 4.23e-13 | 4.25e-06 | 3.64e-05 |
| Ba-140 | 4.00e-05 | 4.00e-08 | 2.07e-06 | 0.00e+00 | 9.59e-09 | 1.14e-03 | 2.74e-05 |
| Ba-141 | 1.12e-10 | 7.70e-14 | 3.55e-12 | 0.00e+00 | 4.64e-14 | 2.12e-06 | 3.39e-06 |
| Ba-142 | 2.84e-11 | 2.36e-14 | 1.40e-12 | 0.00e+00 | 1.36e-14 | 1.11e-06 | 4.95e-07 |
| La-140 | 3.61e-07 | 1.43e-07 | 3.68e-08 | 0.00e+00 | 0.00e+00 | 1.20e-04 | 6.06e-05 |
| La-141 | 4.85e-09 | 1.40e-09 | 2.45e-10 | 0.00e+00 | 0.00e+00 | 1.22e-05 | 5.96e-05 |
| La-142 | 7.36e-10 | 2.69e-10 | 6.46e-11 | 0.00e+00 | 0.00e+00 | 5.87e-06 | 4.25e-05 |
| Ce-141 | 1.98e-05 | 1.19e-05 | 1.42e-06 | 0.00e+00 | 3.75e-06 | 3.69e-04 | 1.54e-05 |
| Ce-143 | 2.09e-07 | 1.38e-07 | 1.58e-08 | 0.00e+00 | 4.03e-08 | 8.30e-05 | 3.55e-05 |
| Ce-144 | 2.28e-03 | 8.65e-04 | 1.26e-04 | 0.00e+00 | 3.84e-04 | 7.03e-03 | 1.06e-04 |
| Pr-143 | 1.00e-05 | 3.74e-06 | 4.99e-07 | 0.00e+00 | 1.41e-06 | 3.09e-04 | 2.66e-05 |
| Pr-144 | 3.42e-11 | 1.32e-11 | 1.72e-12 | 0.00e+00 | 4.80e-12 | 1.15e-06 | 3.06e-06 |
| Nd-147 | 5.67e-06 | 5.81e-06 | 3.57e-07 | 0.00e+00 | 2.25e-06 | 2.30e-04 | 2.23e-05 |
| Pm-147 | 3.91e-04 | 3.07e-05 | 1.56e-05 | 0.00e+00 | 4.93e-05 | 4.55e-04 | 5.75e-06 |
| Pm-148 | 3.34e-06 | 4.82e-07 | 2.44e-07 | 0.00e+00 | 5.76e-07 | 3.20e-04 | 6.04e-05 |
| Pm-148m | 5.00e-05 | 1.24e-05 | 9.94e-06 | 0.00e+00 | 1.45e-05 | 1.22e-03 | 3.37e-05 |
| Pm-149 | 3.10e-07 | 4.08e-08 | 1.78e-08 | 0.00e+00 | 4.96e-08 | 6.50e-05 | 3.01e-05 |
| Pm-151 | 7.52e-08 | 1.10e-08 | 5.55e-09 | 0.00e+00 | 1.30e-08 | 3.25e-05 | 2.58e-05 |
| Sm-151 | 3.38e-04 | 6.45e-05 | 1.63e-05 | 0.00e+00 | 5.24e-05 | 2.98e-04 | 3.46e-06 |
| Sm-153 | 1.53e-07 | 1.18e-07 | 9.06e-09 | 0.00e+00 | 2.47e-08 | 3.70e-05 | 1.93e-05 |
| Eu-152 | 7.83e-04 | 1.77e-04 | 1.72e-04 | 0.00e+00 | 5.94e-04 | 1.48e-03 | 9.88e-06 |
| Eu-154 | 2.96e-03 | 3.46e-04 | 2.45e-04 | 0.00e+00 | 1.14e-03 | 3.05e-03 | 2.84e-05 |
| Eu-155 | 5.97e-04 | 5.72e-05 | 3.46e-05 | 0.00e+00 | 1.58e-04 | 5.20e-04 | 5.19e-05 |
| Eu-156 | 1.56e-05 | 9.59e-06 | 1.54e-06 | 0.00e+00 | 4.48e-06 | 6.12e-04 | 4.14e-05 |
| Tb-160 | 1.12e-04 | 0.00e+00 | 1.40e-05 | 0.00e+00 | 3.20e-05 | 1.11e-03 | 2.14e-05 |

Conversion factors are in units of mrem per pCi inhaled.

Inhalation Dose Conversion factors for Infant age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ho-166m | 1.45e-03 | 3.07e-04 | 2.51e-04 | 0.00e+00 | 4.22e-04 | 2.05e-03 | 1.65e-05 |
| W-181 | 4.86e-08 | 1.46e-08 | 1.67e-09 | 0.00e+00 | 0.00e+00 | 1.33e-05 | 2.63e-07 |
| W-185 | 1.57e-06 | 4.83e-07 | 5.58e-08 | 0.00e+00 | 0.00e+00 | 4.48e-04 | 1.12e-05 |
| W-187 | 9.26e-09 | 6.44e-09 | 2.23e-09 | 0.00e+00 | 0.00e+00 | 2.83e-05 | 2.54e-05 |
| Pb-210 | 8.62e-02 | 2.02e-02 | 3.43e-03 | 0.00e+00 | 6.85e-02 | 1.76e-01 | 1.57e-06 |
| Bi-210 | 2.06e-06 | 1.33e-05 | 1.18e-06 | 0.00e+00 | 1.03e-04 | 9.96e-03 | 3.27e-05 |
| Po-210 | 2.98e-03 | 5.63e-03 | 7.12e-04 | 0.00e+00 | 1.30e-02 | 2.40e-01 | 4.36e-05 |
| Ra-223 | 1.56e-03 | 2.26e-06 | 3.12e-04 | 0.00e+00 | 4.16e-05 | 2.25e-01 | 3.04e-04 |
| Ra-224 | 1.77e-04 | 4.00e-07 | 3.54e-05 | 0.00e+00 | 7.30e-06 | 7.91e-02 | 3.42e-04 |
| Ra-225 | 2.57e-03 | 2.88e-06 | 5.13e-04 | 0.00e+00 | 5.31e-05 | 2.57e-01 | 2.87e-04 |
| Ra-226 | 2.48e-01 | 1.46e-05 | 2.05e-01 | 0.00e+00 | 2.94e-04 | 7.83e-01 | 3.05e-04 |
| Ra-228 | 1.60e-01 | 7.61e-06 | 1.80e-01 | 0.00e+00 | 1.53e-04 | 1.09e+00 | 5.19e-05 |
| Ac-225 | 3.69e-03 | 4.72e-03 | 2.48e-04 | 0.00e+00 | 3.49e-04 | 1.96e-01 | 2.71e-04 |
| Ac-227 | 5.29e+00 | 8.76e-01 | 3.28e-01 | 0.00e+00 | 1.86e-01 | 1.62e+00 | 5.27e-05 |
| Th-227 | 1.82e-03 | 3.03e-05 | 5.24e-05 | 0.00e+00 | 1.13e-04 | 3.27e-01 | 3.53e-04 |
| Th-228 | 8.46e-01 | 1.10e-02 | 2.86e-02 | 0.00e+00 | 5.61e-02 | 4.65e+00 | 3.62e-04 |
| Th-229 | 2.28e+01 | 5.94e-01 | 3.81e-01 | 0.00e+00 | 9.32e-01 | 1.27e+01 | 5.02e-05 |
| Th-230 | 3.46e+00 | 1.79e-01 | 9.65e-02 | 0.00e+00 | 8.82e-01 | 2.18e+00 | 3.87e-05 |
| Th-232 | 3.86e+00 | 1.53e-01 | 2.29e-03 | 0.00e+00 | 7.54e-01 | 2.09e+00 | 3.29e-05 |
| Th-234 | 1.33e-05 | 7.17e-07 | 3.84e-07 | 0.00e+00 | 2.70e-06 | 1.62e-03 | 7.40e-05 |
| Pa-231 | 9.10e+00 | 3.00e-01 | 3.62e-01 | 0.00e+00 | 1.62e+00 | 3.85e-01 | 4.61e-05 |
| Pa-233 | 6.84e-06 | 1.32e-06 | 1.19e-06 | 0.00e+00 | 3.68e-06 | 2.19e-04 | 9.04e-06 |
| U-232 | 2.57e-01 | 0.00e+00 | 2.13e-02 | 0.00e+00 | 2.40e-02 | 1.49e+00 | 4.36e-05 |
| U-233 | 5.44e-02 | 0.00e+00 | 3.83e-03 | 0.00e+00 | 1.09e-02 | 3.56e-01 | 4.03e-05 |
| U-234 | 5.22e-02 | 0.00e+00 | 3.75e-03 | 0.00e+00 | 1.07e-02 | 3.49e-01 | 3.95e-05 |
| U-235 | 5.01e-02 | 0.00e+00 | 3.52e-03 | 0.00e+00 | 1.01e-02 | 3.28e-01 | 5.02e-05 |
| U-236 | 5.01e-02 | 0.00e+00 | 3.60e-03 | 0.00e+00 | 1.03e-02 | 3.35e-01 | 3.71e-05 |
| U-237 | 3.25e-07 | 0.00e+00 | 8.65e-08 | 0.00e+00 | 8.08e-07 | 9.13e-05 | 1.31e-05 |
| U-238 | 4.79e-02 | 0.00e+00 | 3.29e-03 | 0.00e+00 | 9.40e-03 | 3.06e-01 | 3.54e-05 |
| Np-237 | 2.88e+00 | 1.71e+00 | 1.26e-01 | 0.00e+00 | 7.69e-01 | 3.49e-01 | 5.10e-05 |

Conversion factors are in units of mrem per pCi inhaled.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Infant age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Np-238 | 2.67e-06 | 6.05e-07 | 4.16e-08 | 0.00e+00 | 1.47e-07 | 9.19e-05 | 2.58e-05 |
| Np-239 | 2.65e-07 | 2.13e-07 | 1.34e-08 | 0.00e+00 | 4.73e-08 | 4.25e-05 | 1.78e-05 |
| Pu-238 | 2.69e+00 | 1.68e+00 | 1.27e-01 | 0.00e+00 | 4.64e-01 | 9.03e-01 | 4.69e-05 |
| Pu-239 | 2.93e+00 | 1.76e+00 | 1.34e-01 | 0.00e+00 | 4.95e-01 | 8.47e-01 | 4.28e-05 |
| Pu-240 | 2.93e+00 | 1.75e+00 | 1.34e-01 | 0.00e+00 | 4.94e-01 | 8.47e-01 | 4.36e-05 |
| Pu-241 | 8.43e-02 | 1.85e-02 | 3.11e-03 | 0.00e+00 | 1.15e-02 | 7.62e-04 | 8.97e-07 |
| Pu-242 | 2.72e+00 | 1.69e+00 | 1.29e-01 | 0.00e+00 | 4.77e-01 | 8.15e-01 | 4.20e-05 |
| Pu-244 | 3.17e+00 | 1.94e+00 | 1.48e-01 | 0.00e+00 | 5.46e-01 | 9.33e-01 | 6.26e-05 |
| Am-241 | 3.15e+00 | 1.95e+00 | 1.31e-01 | 0.00e+00 | 7.94e-01 | 4.06e-01 | 4.78e-05 |
| Am-242m | 3.25e+00 | 1.86e+00 | 1.35e-01 | 0.00e+00 | 8.03e-01 | 1.64e-01 | 6.01e-05 |
| Am-243 | 3.10e+00 | 1.88e+00 | 1.27e-01 | 0.00e+00 | 7.72e-01 | 3.85e-01 | 5.60e-05 |
| Cm-242 | 1.28e-01 | 8.65e-02 | 5.70e-03 | 0.00e+00 | 1.69e-02 | 2.97e-01 | 5.10e-05 |
| Cm-243 | 2.47e+00 | 1.52e+00 | 1.06e-01 | 0.00e+00 | 3.91e-01 | 4.24e-01 | 5.02e-05 |
| Cm-244 | 2.07e+00 | 1.27e+00 | 8.89e-02 | 0.00e+00 | 3.21e-01 | 4.08e-01 | 4.86e-05 |
| Cm-245 | 3.22e+00 | 1.96e+00 | 1.36e-01 | 0.00e+00 | 5.23e-01 | 3.92e-01 | 4.53e-05 |
| Cm-246 | 3.20e+00 | 1.96e+00 | 1.36e-01 | 0.00e+00 | 5.23e-01 | 3.99e-01 | 4.45e-05 |
| Cm-247 | 3.11e+00 | 1.93e+00 | 1.33e-01 | 0.00e+00 | 5.15e-01 | 3.92e-01 | 5.85e-05 |
| Cm-248 | 2.58e+01 | 1.59e+01 | 1.10e+00 | 0.00e+00 | 4.24e+00 | 3.23e+00 | 9.43e-04 |
| Cf-252 | 2.37e+00 | 0.00e+00 | 1.01e-01 | 0.00e+00 | 0.00e+00 | 1.37e+00 | 1.85e-04 |

Conversion factors are in units of mrem per pCi inhaled.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Ingestion Dose Conversion factors for Adult age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| H-3 | 0.00e+00 | 5.99e-08 | 5.99e-08 | 5.99e-08 | 5.99e-08 | 5.99e-08 | 5.99e-08 |
| Be-10 | 3.18e-06 | 4.91e-07 | 7.94e-08 | 0.00e+00 | 3.71e-07 | 0.00e+00 | 2.68e-05 |
| C-14 | 2.84e-06 | 5.68e-07 | 5.68e-07 | 5.68e-07 | 5.68e-07 | 5.68e-07 | 5.68e-07 |
| N-13 | 8.36e-09 | 8.36e-09 | 8.36e-09 | 8.36e-09 | 8.36e-09 | 8.36e-09 | 8.36e-09 |
| F-18 | 6.24e-07 | 0.00e+00 | 6.92e-08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.85e-08 |
| Na-22 | 1.74e-05 | 1.74e-05 | 1.74e-05 | 1.74e-05 | 1.74e-05 | 1.74e-05 | 1.74e-05 |
| Na-24 | 1.70e-06 | 1.70e-06 | 1.70e-06 | 1.70e-06 | 1.70e-06 | 1.70e-06 | 1.70e-06 |
| P-32 | 1.93e-04 | 1.20e-05 | 7.46e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.17e-05 |
| Ca-41 | 1.85e-04 | 0.00e+00 | 2.00e-05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.84e-07 |
| Sc-46 | 5.51e-09 | 1.07e-08 | 3.11e-09 | 0.00e+00 | 9.99e-09 | 0.00e+00 | 5.21e-05 |
| Cr-51 | 0.00e+00 | 0.00e+00 | 2.66e-09 | 1.59e-09 | 5.86e-10 | 3.53e-09 | 6.69e-07 |
| Mn-54 | 0.00e+00 | 4.57e-06 | 8.72e-07 | 0.00e+00 | 1.36e-06 | 0.00e+00 | 1.40e-05 |
| Mn-56 | 0.00e+00 | 1.15e-07 | 2.04e-08 | 0.00e+00 | 1.46e-07 | 0.00e+00 | 3.67e-06 |
| Fe-55 | 2.75e-06 | 1.90e-06 | 4.43e-07 | 0.00e+00 | 0.00e+00 | 1.06e-06 | 1.09e-06 |
| Fe-59 | 4.34e-06 | 1.02e-05 | 3.91e-06 | 0.00e+00 | 0.00e+00 | 2.85e-06 | 3.40e-05 |
| Co-57 | 0.00e+00 | 1.75e-07 | 2.91e-07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.44e-06 |
| Co-58 | 0.00e+00 | 7.45e-07 | 1.67e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.51e-05 |
| Co-60 | 0.00e+00 | 2.14e-06 | 4.72e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.02e-05 |
| Ni-59 | 9.76e-06 | 3.35e-06 | 1.63e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.90e-07 |
| Ni-63 | 1.30e-04 | 9.01e-06 | 4.36e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.88e-06 |
| Ni-65 | 5.28e-07 | 6.86e-08 | 3.13e-08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.74e-06 |
| Cu-64 | 0.00e+00 | 8.33e-08 | 3.91e-08 | 0.00e+00 | 2.10e-07 | 0.00e+00 | 7.10e-06 |
| Zn-65 | 4.84e-06 | 1.54e-05 | 6.96e-06 | 0.00e+00 | 1.03e-05 | 0.00e+00 | 9.70e-06 |
| Zn-69 | 1.03e-08 | 1.97e-08 | 1.37e-09 | 0.00e+00 | 1.28e-08 | 0.00e+00 | 2.96e-09 |
| Zn-69m | 1.70e-07 | 4.08e-07 | 3.73e-08 | 0.00e+00 | 2.47e-07 | 0.00e+00 | 2.49e-05 |
| Se-79 | 0.00e+00 | 2.63e-06 | 4.39e-07 | 0.00e+00 | 4.55e-06 | 0.00e+00 | 5.38e-07 |
| Br-82 | 0.00e+00 | 0.00e+00 | 2.26e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.59e-06 |
| Br-83 | 0.00e+00 | 0.00e+00 | 4.02e-08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.79e-08 |
| Br-84 | 0.00e+00 | 0.00e+00 | 5.21e-08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.09e-13 |
| Br-85 | 0.00e+00 | 0.00e+00 | 2.14e-09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of mrem per pCi ingested.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Ingestion Dose Conversion factors for Adult age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Rb-86 | 0.00e+00 | 2.11e-05 | 9.83e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.16e-06 |
| Rb-87 | 0.00e+00 | 1.23e-05 | 4.28e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.76e-07 |
| Rb-88 | 0.00e+00 | 6.05e-08 | 3.21e-08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 8.36e-19 |
| Rb-89 | 0.00e+00 | 4.01e-08 | 2.82e-08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.33e-21 |
| Sr-89 | 3.08e-04 | 0.00e+00 | 8.84e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.94e-05 |
| Sr-90 | 8.71e-03 | 0.00e+00 | 1.75e-04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.19e-04 |
| Sr-91 | 5.67e-06 | 0.00e+00 | 2.29e-07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.70e-05 |
| Sr-92 | 2.15e-06 | 0.00e+00 | 9.30e-08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.26e-05 |
| Y-90 | 9.62e-09 | 0.00e+00 | 2.58e-10 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.02e-04 |
| Y-91 | 1.41e-07 | 0.00e+00 | 3.77e-09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.76e-05 |
| Y-91m | 9.09e-11 | 0.00e+00 | 3.52e-12 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.67e-10 |
| Y-92 | 8.45e-10 | 0.00e+00 | 2.47e-11 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.48e-05 |
| Y-93 | 2.68e-09 | 0.00e+00 | 7.40e-11 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 8.50e-05 |
| Zr-93 | 4.18e-08 | 2.34e-09 | 1.09e-09 | 0.00e+00 | 8.87e-09 | 0.00e+00 | 2.43e-06 |
| Zr-95 | 3.04e-08 | 9.75e-09 | 6.60e-09 | 0.00e+00 | 1.53e-08 | 0.00e+00 | 3.09e-05 |
| Zr-97 | 1.68e-09 | 3.39e-10 | 1.55e-10 | 0.00e+00 | 5.12e-10 | 0.00e+00 | 1.05e-04 |
| Nb-93m | 2.55e-08 | 8.32e-09 | 2.05e-09 | 0.00e+00 | 9.57e-09 | 0.00e+00 | 3.84e-06 |
| Nb-95 | 6.22e-09 | 3.46e-09 | 1.86e-09 | 0.00e+00 | 3.42e-09 | 0.00e+00 | 2.10e-05 |
| Nb-97 | 5.22e-11 | 1.32e-11 | 4.82e-12 | 0.00e+00 | 1.54e-11 | 0.00e+00 | 4.87e-08 |
| Mo-93 | 0.00e+00 | 7.51e-06 | 2.03e-07 | 0.00e+00 | 2.13e-06 | 0.00e+00 | 1.22e-06 |
| Mo-99 | 0.00e+00 | 4.31e-06 | 8.20e-07 | 0.00e+00 | 9.76e-06 | 0.00e+00 | 9.99e-06 |
| Tc-101 | 2.54e-10 | 3.66e-10 | 3.59e-09 | 0.00e+00 | 6.59e-09 | 1.87e-10 | 1.10e-21 |
| Tc-99 | 1.25e-07 | 1.86e-07 | 5.02e-08 | 0.00e+00 | 2.34e-06 | 1.58e-08 | 6.08e-06 |
| Tc-99m | 2.47e-10 | 6.98e-10 | 8.89e-09 | 0.00e+00 | 1.06e-08 | 3.42e-10 | 4.13e-07 |
| Ru-103 | 1.85e-07 | 0.00e+00 | 7.97e-08 | 0.00e+00 | 7.06e-07 | 0.00e+00 | 2.16e-05 |
| Ru-105 | 1.54e-08 | 0.00e+00 | 6.08e-09 | 0.00e+00 | 1.99e-07 | 0.00e+00 | 9.42e-06 |
| Ru-106 | 2.75e-06 | 0.00e+00 | 3.48e-07 | 0.00e+00 | 5.31e-06 | 0.00e+00 | 1.78e-04 |
| Rh-105 | 1.21e-07 | 8.85e-08 | 5.83e-08 | 0.00e+00 | 3.76e-07 | 0.00e+00 | 1.41e-05 |
| Pd-107 | 0.00e+00 | 1.47e-07 | 9.40e-09 | 0.00e+00 | 1.32e-06 | 0.00e+00 | 9.11e-07 |
| Pd-109 | 0.00e+00 | 1.77e-07 | 3.99e-08 | 0.00e+00 | 1.01e-06 | 0.00e+00 | 1.96e-05 |

Conversion factors are in units of mrem per pCi ingested.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Ingestion Dose Conversion factors for Adult age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ag-110m | 1.60e-07 | 1.48e-07 | 8.79e-08 | 0.00e+00 | 2.91e-07 | 0.00e+00 | 6.04e-05 |
| Ag-111 | 5.81e-08 | 2.43e-08 | 1.21e-08 | 0.00e+00 | 7.84e-08 | 0.00e+00 | 4.46e-05 |
| Cd-113m | 0.00e+00 | 3.18e-06 | 1.02e-07 | 0.00e+00 | 3.50e-06 | 0.00e+00 | 2.56e-05 |
| Cd-115m | 0.00e+00 | 1.84e-06 | 5.87e-08 | 0.00e+00 | 1.46e-06 | 0.00e+00 | 7.74e-05 |
| Sn-123 | 3.11e-05 | 5.15e-07 | 7.59e-07 | 4.38e-07 | 0.00e+00 | 0.00e+00 | 6.33e-05 |
| Sn-125 | 8.33e-06 | 1.68e-07 | 3.78e-07 | 1.39e-07 | 0.00e+00 | 0.00e+00 | 1.04e-04 |
| Sn-126 | 8.45e-05 | 1.67e-06 | 2.40e-06 | 4.92e-07 | 0.00e+00 | 0.00e+00 | 2.43e-05 |
| Sb-124 | 2.80e-06 | 5.29e-08 | 1.11e-06 | 6.79e-09 | 0.00e+00 | 2.18e-06 | 7.95e-05 |
| Sb-125 | 1.79e-06 | 2.00e-08 | 4.26e-07 | 1.82e-09 | 0.00e+00 | 1.38e-06 | 1.97e-05 |
| Sb-126 | 1.15e-06 | 2.34e-08 | 4.15e-07 | 7.04e-09 | 0.00e+00 | 7.05e-07 | 9.40e-05 |
| Sb-127 | 2.58e-07 | 5.65e-09 | 9.90e-08 | 3.10e-09 | 0.00e+00 | 1.53e-07 | 5.90e-05 |
| Te-125m | 2.68e-06 | 9.71e-07 | 3.59e-07 | 8.06e-07 | 1.09e-05 | 0.00e+00 | 1.07e-05 |
| Te-127 | 1.10e-07 | 3.95e-08 | 2.38e-08 | 8.15e-08 | 4.48e-07 | 0.00e+00 | 8.68e-06 |
| Te-127m | 6.77e-06 | 2.42e-06 | 8.25e-07 | 1.73e-06 | 2.75e-05 | 0.00e+00 | 2.27e-05 |
| Te-129 | 3.14e-08 | 1.18e-08 | 7.65e-09 | 2.41e-08 | 1.32e-07 | 0.00e+00 | 2.37e-08 |
| Te-129m | 1.15e-05 | 4.29e-06 | 1.82e-06 | 3.95e-06 | 4.80e-05 | 0.00e+00 | 5.79e-05 |
| Te-131 | 1.97e-08 | 8.23e-09 | 6.22e-09 | 1.62e-08 | 8.63e-08 | 0.00e+00 | 2.79e-09 |
| Te-131m | 1.73e-06 | 8.46e-07 | 7.05e-07 | 1.34e-06 | 8.57e-06 | 0.00e+00 | 8.40e-05 |
| Te-132 | 2.52e-06 | 1.63e-06 | 1.53e-06 | 1.80e-06 | 1.57e-05 | 0.00e+00 | 7.71e-05 |
| Te-133m | 4.62e-08 | 2.70e-08 | 2.60e-08 | 3.91e-08 | 2.67e-07 | 0.00e+00 | 9.26e-09 |
| Te-134 | 3.24e-08 | 2.12e-08 | 1.30e-08 | 2.83e-08 | 2.05e-07 | 0.00e+00 | 3.59e-11 |
| I-129 | 3.27e-06 | 2.81e-06 | 9.21e-06 | 7.23e-03 | 6.04e-06 | 0.00e+00 | 4.44e-07 |
| I-130 | 7.56e-07 | 2.23e-06 | 8.80e-07 | 1.89e-04 | 3.48e-06 | 0.00e+00 | 1.92e-06 |
| I-131 | 4.16e-06 | 5.95e-06 | 3.41e-06 | 1.95e-03 | 1.02e-05 | 0.00e+00 | 1.57e-06 |
| I-132 | 2.03e-07 | 5.43e-07 | 1.90e-07 | 1.90e-05 | 8.65e-07 | 0.00e+00 | 1.02e-07 |
| I-133 | 1.42e-06 | 2.47e-06 | 7.53e-07 | 3.63e-04 | 4.31e-06 | 0.00e+00 | 2.22e-06 |
| I-134 | 1.06e-07 | 2.88e-07 | 1.03e-07 | 4.99e-06 | 4.58e-07 | 0.00e+00 | 2.51e-10 |
| I-135 | 4.43e-07 | 1.16e-06 | 4.28e-07 | 7.65e-05 | 1.86e-06 | 0.00e+00 | 1.31e-06 |
| Cs-134 | 6.22e-05 | 1.48e-04 | 1.21e-04 | 0.00e+00 | 4.79e-05 | 1.59e-05 | 2.59e-06 |
| Cs-134m | 2.13e-08 | 4.48e-08 | 2.29e-08 | 0.00e+00 | 2.43e-08 | 3.83e-09 | 1.58e-08 |

Conversion factors are in units of mrem per pCi ingested.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Ingestion Dose Conversion factors for Adult age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Cs-135 | 1.95e-05 | 1.80e-05 | 7.99e-06 | 0.00e+00 | 6.81e-06 | 2.04e-06 | 4.21e-07 |
| Cs-136 | 6.51e-06 | 2.57e-05 | 1.85e-05 | 0.00e+00 | 1.43e-05 | 1.96e-06 | 2.92e-06 |
| Cs-137 | 7.97e-05 | 1.09e-04 | 7.14e-05 | 0.00e+00 | 3.70e-05 | 1.23e-05 | 2.11e-06 |
| Cs-138 | 5.52e-08 | 1.09e-07 | 5.40e-08 | 0.00e+00 | 8.01e-08 | 7.91e-09 | 4.65e-13 |
| Cs-139 | 3.41e-08 | 5.08e-08 | 1.85e-08 | 0.00e+00 | 4.07e-08 | 3.70e-09 | 1.10e-30 |
| Ba-139 | 9.70e-08 | 6.91e-11 | 2.84e-09 | 0.00e+00 | 6.46e-11 | 3.92e-11 | 1.72e-07 |
| Ba-140 | 2.03e-05 | 2.55e-08 | 1.33e-06 | 0.00e+00 | 8.67e-09 | 1.46e-08 | 4.18e-05 |
| Ba-141 | 4.71e-08 | 3.56e-11 | 1.59e-09 | 0.00e+00 | 3.31e-11 | 2.02e-11 | 2.22e-17 |
| Ba-142 | 2.13e-08 | 2.19e-11 | 1.34e-09 | 0.00e+00 | 1.85e-11 | 1.24e-11 | 3.00e-26 |
| La-140 | 2.50e-09 | 1.26e-09 | 3.33e-10 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 9.25e-05 |
| La-141 | 3.19e-10 | 9.90e-11 | 1.62e-11 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.18e-05 |
| La-142 | 1.28e-10 | 5.82e-11 | 1.45e-11 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.25e-07 |
| Ce-141 | 9.36e-09 | 6.33e-09 | 7.18e-10 | 0.00e+00 | 2.94e-09 | 0.00e+00 | 2.42e-05 |
| Ce-143 | 1.65e-09 | 1.22e-06 | 1.35e-10 | 0.00e+00 | 5.37e-10 | 0.00e+00 | 4.56e-05 |
| Ce-144 | 4.88e-07 | 2.04e-07 | 2.62e-08 | 0.00e+00 | 1.21e-07 | 0.00e+00 | 1.65e-04 |
| Pr-143 | 9.20e-09 | 3.69e-09 | 4.56e-10 | 0.00e+00 | 2.13e-09 | 0.00e+00 | 4.03e-05 |
| Pr-144 | 3.01e-11 | 1.25e-11 | 1.53e-12 | 0.00e+00 | 7.05e-12 | 0.00e+00 | 4.33e-18 |
| Nd-147 | 6.29e-09 | 7.27e-09 | 4.35e-10 | 0.00e+00 | 4.25e-09 | 0.00e+00 | 3.49e-05 |
| Pm-147 | 7.54e-08 | 7.09e-09 | 2.87e-09 | 0.00e+00 | 1.34e-08 | 0.00e+00 | 8.93e-06 |
| Pm-148 | 7.17e-09 | 1.19e-09 | 5.99e-10 | 0.00e+00 | 2.25e-09 | 0.00e+00 | 9.35e-05 |
| Pm-148m | 3.07e-08 | 7.95e-09 | 6.08e-09 | 0.00e+00 | 1.20e-08 | 0.00e+00 | 6.74e-05 |
| Pm-149 | 1.52e-09 | 2.15e-10 | 8.78e-11 | 0.00e+00 | 4.06e-10 | 0.00e+00 | 4.03e-05 |
| Pm-151 | 6.97e-10 | 1.17e-10 | 5.91e-11 | 0.00e+00 | 2.09e-10 | 0.00e+00 | 3.22e-05 |
| Sm-151 | 6.90e-08 | 1.19e-08 | 2.85e-09 | 0.00e+00 | 1.33e-08 | 0.00e+00 | 5.25e-06 |
| Sm-153 | 8.57e-10 | 7.15e-10 | 5.22e-11 | 0.00e+00 | 2.31e-10 | 0.00e+00 | 2.55e-05 |
| Eu-152 | 1.95e-07 | 4.44e-08 | 3.90e-08 | 0.00e+00 | 2.75e-07 | 0.00e+00 | 2.56e-05 |
| Eu-154 | 6.15e-07 | 7.56e-08 | 5.38e-08 | 0.00e+00 | 3.62e-07 | 0.00e+00 | 5.48e-05 |
| Eu-155 | 8.60e-08 | 1.22e-08 | 7.87e-09 | 0.00e+00 | 5.63e-08 | 0.00e+00 | 9.60e-06 |
| Eu-156 | 1.37e-08 | 1.06e-08 | 1.71e-09 | 0.00e+00 | 7.08e-09 | 0.00e+00 | 7.26e-05 |
| Tb-160 | 4.70e-08 | 0.00e+00 | 5.86e-09 | 0.00e+00 | 1.94e-08 | 0.00e+00 | 4.33e-05 |

Conversion factors are in units of mrem per pCi ingested.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Ingestion Dose Conversion factors for Adult age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ho-166m | 2.70e-07 | 8.43e-08 | 6.40e-08 | 0.00e+00 | 1.26e-07 | 0.00e+00 | 2.56e-05 |
| W-181 | 9.91e-09 | 3.23e-09 | 3.46e-10 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.68e-07 |
| W-185 | 4.05e-07 | 1.35e-07 | 1.42e-08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.56e-05 |
| W-187 | 1.03e-07 | 8.61e-08 | 3.01e-08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.82e-05 |
| Pb-210 | 1.53e-02 | 4.37e-03 | 5.44e-04 | 0.00e+00 | 1.23e-02 | 0.00e+00 | 2.24e-06 |
| Bi-210 | 4.61e-07 | 3.18e-06 | 2.64e-07 | 0.00e+00 | 3.83e-05 | 0.00e+00 | 4.75e-05 |
| Po-210 | 3.56e-04 | 7.56e-04 | 8.59e-05 | 0.00e+00 | 2.52e-03 | 0.00e+00 | 6.36e-05 |
| Ra-223 | 4.97e-03 | 7.65e-06 | 9.94e-04 | 0.00e+00 | 2.17e-04 | 0.00e+00 | 3.21e-04 |
| Ra-224 | 1.61e-03 | 3.90e-06 | 3.23e-04 | 0.00e+00 | 1.10e-04 | 0.00e+00 | 3.40e-04 |
| Ra-225 | 6.56e-03 | 7.78e-06 | 1.31e-03 | 0.00e+00 | 2.21e-04 | 0.00e+00 | 3.06e-04 |
| Ra-226 | 3.02e-01 | 5.74e-06 | 2.20e-01 | 0.00e+00 | 1.63e-04 | 0.00e+00 | 3.32e-04 |
| Ra-228 | 1.12e-01 | 3.12e-06 | 1.21e-01 | 0.00e+00 | 8.83e-05 | 0.00e+00 | 5.64e-05 |
| Ac-225 | 4.40e-06 | 6.06e-06 | 2.96e-07 | 0.00e+00 | 6.90e-07 | 0.00e+00 | 4.07e-04 |
| Ac-227 | 1.87e-03 | 2.48e-04 | 1.11e-04 | 0.00e+00 | 8.00e-05 | 0.00e+00 | 8.19e-05 |
| Th-227 | 1.37e-05 | 2.48e-07 | 3.95e-07 | 0.00e+00 | 1.41e-06 | 0.00e+00 | 5.40e-04 |
| Th-228 | 4.96e-04 | 8.40e-06 | 1.68e-05 | 0.00e+00 | 4.67e-05 | 0.00e+00 | 5.63e-04 |
| Th-229 | 1.36e-02 | 3.89e-04 | 2.25e-04 | 0.00e+00 | 1.88e-03 | 0.00e+00 | 7.81e-05 |
| Th-230 | 2.06e-03 | 1.17e-04 | 5.70e-05 | 0.00e+00 | 5.65e-04 | 0.00e+00 | 6.02e-05 |
| Th-232 | 2.30e-03 | 1.00e-04 | 1.50e-06 | 0.00e+00 | 4.82e-04 | 0.00e+00 | 5.12e-05 |
| Th-234 | 8.01e-08 | 4.71e-09 | 2.31e-09 | 0.00e+00 | 2.67e-08 | 0.00e+00 | 1.13e-04 |
| Pa-231 | 4.10e-03 | 1.54e-04 | 1.59e-04 | 0.00e+00 | 8.64e-04 | 0.00e+00 | 7.17e-05 |
| Pa-233 | 5.26e-09 | 1.06e-09 | 9.12e-10 | 0.00e+00 | 3.99e-09 | 0.00e+00 | 1.64e-05 |
| U-232 | 4.13e-03 | 0.00e+00 | 2.95e-04 | 0.00e+00 | 4.47e-04 | 0.00e+00 | 6.78e-05 |
| U-233 | 8.71e-04 | 0.00e+00 | 5.28e-05 | 0.00e+00 | 2.03e-04 | 0.00e+00 | 6.27e-05 |
| U-234 | 8.36e-04 | 0.00e+00 | 5.17e-05 | 0.00e+00 | 1.99e-04 | 0.00e+00 | 6.14e-05 |
| U-235 | 8.01e-04 | 0.00e+00 | 4.86e-05 | 0.00e+00 | 1.87e-04 | 0.00e+00 | 7.81e-05 |
| U-236 | 8.01e-04 | 0.00e+00 | 4.96e-05 | 0.00e+00 | 1.91e-04 | 0.00e+00 | 5.76e-05 |
| U-237 | 5.52e-08 | 0.00e+00 | 1.47e-08 | 0.00e+00 | 2.27e-07 | 0.00e+00 | 1.94e-05 |
| U-238 | 7.67e-04 | 0.00e+00 | 4.54e-05 | 0.00e+00 | 1.75e-04 | 0.00e+00 | 5.50e-05 |
| Np-237 | 1.26e-03 | 8.96e-05 | 5.54e-05 | 0.00e+00 | 4.12e-04 | 0.00e+00 | 7.94e-05 |

Conversion factors are in units of mrem per pCi ingested.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Ingestion Dose Conversion factors for Adult age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Np-238 | 1.37e-08 | 3.69e-10 | 2.13e-10 | 0.00e+00 | 1.25e-09 | 0.00e+00 | 3.43e-05 |
| Np-239 | 1.19e-09 | 1.17e-10 | 6.45e-11 | 0.00e+00 | 3.65e-10 | 0.00e+00 | 2.40e-05 |
| Pu-238 | 6.30e-04 | 7.98e-05 | 1.71e-05 | 0.00e+00 | 7.32e-05 | 0.00e+00 | 7.30e-05 |
| Pu-239 | 7.25e-04 | 8.71e-05 | 1.91e-05 | 0.00e+00 | 8.11e-05 | 0.00e+00 | 6.66e-05 |
| Pu-240 | 7.24e-04 | 8.70e-05 | 1.91e-05 | 0.00e+00 | 8.10e-05 | 0.00e+00 | 6.78e-05 |
| Pu-241 | 1.57e-05 | 7.45e-07 | 3.32e-07 | 0.00e+00 | 1.53e-06 | 0.00e+00 | 1.40e-06 |
| Pu-242 | 6.72e-04 | 8.39e-05 | 1.84e-05 | 0.00e+00 | 7.81e-05 | 0.00e+00 | 6.53e-05 |
| Pu-244 | 7.84e-04 | 9.61e-05 | 2.11e-05 | 0.00e+00 | 8.95e-05 | 0.00e+00 | 9.73e-05 |
| Am-241 | 7.55e-04 | 7.05e-04 | 5.41e-05 | 0.00e+00 | 4.07e-04 | 0.00e+00 | 7.42e-05 |
| Am-242m | 7.61e-04 | 6.63e-04 | 5.43e-05 | 0.00e+00 | 4.05e-04 | 0.00e+00 | 9.34e-05 |
| Am-243 | 7.54e-04 | 6.90e-04 | 5.30e-05 | 0.00e+00 | 3.99e-04 | 0.00e+00 | 8.70e-05 |
| Cm-242 | 2.06e-05 | 2.19e-05 | 1.37e-06 | 0.00e+00 | 6.22e-06 | 0.00e+00 | 7.92e-05 |
| Cm-243 | 5.99e-04 | 5.49e-04 | 3.75e-05 | 0.00e+00 | 1.75e-04 | 0.00e+00 | 7.81e-05 |
| Cm-244 | 4.56e-04 | 4.27e-04 | 2.87e-05 | 0.00e+00 | 1.34e-04 | 0.00e+00 | 7.55e-05 |
| Cm-245 | 9.38e-04 | 8.17e-04 | 5.76e-05 | 0.00e+00 | 2.69e-04 | 0.00e+00 | 7.04e-05 |
| Cm-246 | 9.30e-04 | 8.16e-04 | 5.75e-05 | 0.00e+00 | 2.68e-04 | 0.00e+00 | 6.91e-05 |
| Cm-247 | 9.07e-04 | 8.04e-04 | 5.67e-05 | 0.00e+00 | 2.64e-04 | 0.00e+00 | 9.09e-05 |
| Cm-248 | 7.54e-03 | 6.63e-03 | 4.67e-04 | 0.00e+00 | 2.18e-03 | 0.00e+00 | 1.47e-03 |
| Cf-252 | 2.61e-04 | 0.00e+00 | 6.29e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.88e-04 |

Conversion factors are in units of mrem per pCi ingested.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Ingestion Dose Conversion factors for Teen age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| H-3 | 0.00e+00 | 6.04e-08 | 6.04e-08 | 6.04e-08 | 6.04e-08 | 6.04e-08 | 6.04e-08 |
| Be-10 | 4.48e-06 | 6.94e-07 | 1.13e-07 | 0.00e+00 | 5.30e-07 | 0.00e+00 | 2.84e-05 |
| C-14 | 4.06e-06 | 8.12e-07 | 8.12e-07 | 8.12e-07 | 8.12e-07 | 8.12e-07 | 8.12e-07 |
| N-13 | 1.15e-08 | 1.15e-08 | 1.15e-08 | 1.15e-08 | 1.15e-08 | 1.15e-08 | 1.15e-08 |
| F-18 | 8.64e-07 | 0.00e+00 | 9.47e-08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.78e-08 |
| Na-22 | 2.34e-05 | 2.34e-05 | 2.34e-05 | 2.34e-05 | 2.34e-05 | 2.34e-05 | 2.34e-05 |
| Na-24 | 2.30e-06 | 2.30e-06 | 2.30e-06 | 2.30e-06 | 2.30e-06 | 2.30e-06 | 2.30e-06 |
| P-32 | 2.76e-04 | 1.71e-05 | 1.07e-05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.32e-05 |
| Ca-41 | 1.97e-04 | 0.00e+00 | 2.13e-05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.95e-07 |
| Sc-46 | 7.24e-09 | 1.41e-08 | 4.18e-09 | 0.00e+00 | 1.35e-08 | 0.00e+00 | 4.80e-05 |
| Cr-51 | 0.00e+00 | 0.00e+00 | 3.60e-09 | 2.00e-09 | 7.89e-10 | 5.14e-09 | 6.05e-07 |
| Mn-54 | 0.00e+00 | 5.90e-06 | 1.17e-06 | 0.00e+00 | 1.76e-06 | 0.00e+00 | 1.21e-05 |
| Mn-56 | 0.00e+00 | 1.58e-07 | 2.81e-08 | 0.00e+00 | 2.00e-07 | 0.00e+00 | 1.04e-05 |
| Fe-55 | 3.78e-06 | 2.68e-06 | 6.25e-07 | 0.00e+00 | 0.00e+00 | 1.70e-06 | 1.16e-06 |
| Fe-59 | 5.87e-06 | 1.37e-05 | 5.29e-06 | 0.00e+00 | 0.00e+00 | 4.32e-06 | 3.24e-05 |
| Co-57 | 0.00e+00 | 2.38e-07 | 3.99e-07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.44e-06 |
| Co-58 | 0.00e+00 | 9.72e-07 | 2.24e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.34e-05 |
| Co-60 | 0.00e+00 | 2.81e-06 | 6.33e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.66e-05 |
| Ni-59 | 1.32e-05 | 4.66e-06 | 2.24e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.31e-07 |
| Ni-63 | 1.77e-04 | 1.25e-05 | 6.00e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.99e-06 |
| Ni-65 | 7.49e-07 | 9.57e-08 | 4.36e-08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.19e-06 |
| Cu-64 | 0.00e+00 | 1.15e-07 | 5.41e-08 | 0.00e+00 | 2.91e-07 | 0.00e+00 | 8.92e-06 |
| Zn-65 | 5.76e-06 | 2.00e-05 | 9.33e-06 | 0.00e+00 | 1.28e-05 | 0.00e+00 | 8.47e-06 |
| Zn-69 | 1.47e-08 | 2.80e-08 | 1.96e-09 | 0.00e+00 | 1.83e-08 | 0.00e+00 | 5.16e-08 |
| Zn-69m | 2.40e-07 | 5.66e-07 | 5.19e-08 | 0.00e+00 | 3.44e-07 | 0.00e+00 | 3.11e-05 |
| Se-79 | 0.00e+00 | 3.73e-06 | 6.27e-07 | 0.00e+00 | 6.50e-06 | 0.00e+00 | 5.70e-07 |
| Br-82 | 0.00e+00 | 0.00e+00 | 3.04e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-83 | 0.00e+00 | 0.00e+00 | 5.74e-08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-84 | 0.00e+00 | 0.00e+00 | 7.22e-08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-85 | 0.00e+00 | 0.00e+00 | 3.05e-09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of mrem per pCi ingested.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Ingestion Dose Conversion factors for Teen age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Rb-86 | 0.00e+00 | 2.98e-05 | 1.40e-05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.41e-06 |
| Rb-87 | 0.00e+00 | 1.75e-05 | 6.11e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.11e-07 |
| Rb-88 | 0.00e+00 | 8.52e-08 | 4.54e-08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.30e-15 |
| Rb-89 | 0.00e+00 | 5.50e-08 | 3.89e-08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 8.43e-17 |
| Sr-89 | 4.40e-04 | 0.00e+00 | 1.26e-05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.24e-05 |
| Sr-90 | 1.02e-02 | 0.00e+00 | 2.04e-04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.33e-04 |
| Sr-91 | 8.07e-06 | 0.00e+00 | 3.21e-07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.66e-05 |
| Sr-92 | 3.05e-06 | 0.00e+00 | 1.30e-07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.77e-05 |
| Y-90 | 1.37e-08 | 0.00e+00 | 3.69e-10 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.13e-04 |
| Y-91 | 2.01e-07 | 0.00e+00 | 5.39e-09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 8.24e-05 |
| Y-91m | 1.29e-10 | 0.00e+00 | 4.93e-12 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.09e-09 |
| Y-92 | 1.21e-09 | 0.00e+00 | 3.50e-11 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.32e-05 |
| Y-93 | 3.83e-09 | 0.00e+00 | 1.05e-10 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.17e-04 |
| Zr-93 | 5.53e-08 | 2.73e-09 | 1.49e-09 | 0.00e+00 | 9.65e-09 | 0.00e+00 | 2.58e-06 |
| Zr-95 | 4.12e-08 | 1.30e-08 | 8.94e-09 | 0.00e+00 | 1.91e-08 | 0.00e+00 | 3.00e-05 |
| Zr-97 | 2.37e-09 | 4.69e-10 | 2.16e-10 | 0.00e+00 | 7.11e-10 | 0.00e+00 | 1.27e-04 |
| Nb-93m | 3.44e-08 | 1.13e-08 | 2.83e-09 | 0.00e+00 | 1.32e-08 | 0.00e+00 | 4.07e-06 |
| Nb-95 | 8.22e-09 | 4.56e-09 | 2.51e-09 | 0.00e+00 | 4.42e-09 | 0.00e+00 | 1.95e-05 |
| Nb-97 | 7.37e-11 | 1.83e-11 | 6.68e-12 | 0.00e+00 | 2.14e-11 | 0.00e+00 | 4.37e-07 |
| Mo-93 | 0.00e+00 | 1.06e-05 | 2.90e-07 | 0.00e+00 | 3.04e-06 | 0.00e+00 | 1.29e-06 |
| Mo-99 | 0.00e+00 | 6.03e-06 | 1.15e-06 | 0.00e+00 | 1.38e-05 | 0.00e+00 | 1.08e-05 |
| Tc-101 | 3.60e-10 | 5.12e-10 | 5.03e-09 | 0.00e+00 | 9.26e-09 | 3.12e-10 | 8.75e-17 |
| Tc-99 | 1.79e-07 | 2.63e-07 | 7.17e-08 | 0.00e+00 | 3.34e-06 | 2.72e-08 | 6.44e-06 |
| Tc-99m | 3.32e-10 | 9.26e-10 | 1.20e-08 | 0.00e+00 | 1.38e-08 | 5.14e-10 | 6.08e-07 |
| Ru-103 | 2.55e-07 | 0.00e+00 | 1.09e-07 | 0.00e+00 | 8.99e-07 | 0.00e+00 | 2.13e-05 |
| Ru-105 | 2.18e-08 | 0.00e+00 | 8.46e-09 | 0.00e+00 | 2.75e-07 | 0.00e+00 | 1.76e-05 |
| Ru-106 | 3.92e-06 | 0.00e+00 | 4.94e-07 | 0.00e+00 | 7.56e-06 | 0.00e+00 | 1.88e-04 |
| Rh-105 | 1.73e-07 | 1.25e-07 | 8.20e-08 | 0.00e+00 | 5.31e-07 | 0.00e+00 | 1.59e-05 |
| Pd-107 | 0.00e+00 | 2.08e-07 | 1.34e-08 | 0.00e+00 | 1.88e-06 | 0.00e+00 | 9.66e-07 |
| Pd-109 | 0.00e+00 | 2.51e-07 | 5.70e-08 | 0.00e+00 | 1.45e-06 | 0.00e+00 | 2.53e-05 |

Conversion factors are in units of mrem per pCi ingested.

Ingestion Dose Conversion factors for Teen age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ag-110m | 2.05e-07 | 1.94e-07 | 1.18e-07 | 0.00e+00 | 3.70e-07 | 0.00e+00 | 5.45e-05 |
| Ag-111 | 8.29e-08 | 3.44e-08 | 1.73e-08 | 0.00e+00 | 1.12e-07 | 0.00e+00 | 4.80e-05 |
| Cd-113m | 0.00e+00 | 4.51e-06 | 1.45e-07 | 0.00e+00 | 4.99e-06 | 0.00e+00 | 2.71e-05 |
| Cd-115m | 0.00e+00 | 2.60e-06 | 8.39e-08 | 0.00e+00 | 2.08e-06 | 0.00e+00 | 8.23e-05 |
| Sn-123 | 4.44e-05 | 7.29e-07 | 1.08e-06 | 5.84e-07 | 0.00e+00 | 0.00e+00 | 6.71e-05 |
| Sn-125 | 1.19e-05 | 2.37e-07 | 5.37e-07 | 1.86e-07 | 0.00e+00 | 0.00e+00 | 1.12e-04 |
| Sn-126 | 1.16e-04 | 2.16e-06 | 3.30e-06 | 5.69e-07 | 0.00e+00 | 0.00e+00 | 2.58e-05 |
| Sb-124 | 3.87e-06 | 7.13e-08 | 1.51e-06 | 8.78e-09 | 0.00e+00 | 3.38e-06 | 7.80e-05 |
| Sb-125 | 2.48e-06 | 2.71e-08 | 5.80e-07 | 2.37e-09 | 0.00e+00 | 2.18e-06 | 1.93e-05 |
| Sb-126 | 1.59e-06 | 3.25e-08 | 5.71e-07 | 8.99e-09 | 0.00e+00 | 1.14e-06 | 9.41e-05 |
| Sb-127 | 3.63e-07 | 7.76e-09 | 1.37e-07 | 4.08e-09 | 0.00e+00 | 2.47e-07 | 6.16e-05 |
| Te-125m | 3.83e-06 | 1.38e-06 | 5.12e-07 | 1.07e-06 | 0.00e+00 | 0.00e+00 | 1.13e-05 |
| Te-127 | 1.58e-07 | 5.60e-08 | 3.40e-08 | 1.09e-07 | 6.40e-07 | 0.00e+00 | 1.22e-05 |
| Te-127m | 9.67e-06 | 3.43e-06 | 1.15e-06 | 2.30e-06 | 3.92e-05 | 0.00e+00 | 2.41e-05 |
| Te-129 | 4.48e-08 | 1.67e-08 | 1.09e-08 | 3.20e-08 | 1.88e-07 | 0.00e+00 | 2.45e-07 |
| Te-129m | 1.63e-05 | 6.05e-06 | 2.58e-06 | 5.26e-06 | 6.82e-05 | 0.00e+00 | 6.12e-05 |
| Te-131 | 2.79e-08 | 1.15e-08 | 8.72e-09 | 2.15e-08 | 1.22e-07 | 0.00e+00 | 2.29e-09 |
| Te-131m | 2.44e-06 | 1.17e-06 | 9.76e-07 | 1.76e-06 | 1.22e-05 | 0.00e+00 | 9.39e-05 |
| Te-132 | 3.49e-06 | 2.21e-06 | 2.08e-06 | 2.33e-06 | 2.12e-05 | 0.00e+00 | 7.00e-05 |
| Te-133m | 6.44e-08 | 3.66e-08 | 3.56e-08 | 5.11e-08 | 3.62e-07 | 0.00e+00 | 1.48e-07 |
| Te-134 | 4.47e-08 | 2.87e-08 | 3.00e-08 | 3.67e-08 | 2.74e-07 | 0.00e+00 | 1.66e-09 |
| I-129 | 4.66e-06 | 3.92e-06 | 6.54e-06 | 4.77e-03 | 7.01e-06 | 0.00e+00 | 4.57e-07 |
| I-130 | 1.03e-06 | 2.98e-06 | 1.19e-06 | 2.43e-04 | 4.59e-06 | 0.00e+00 | 2.29e-06 |
| I-131 | 5.85e-06 | 8.19e-06 | 4.40e-06 | 2.39e-03 | 1.41e-05 | 0.00e+00 | 1.62e-06 |
| I-132 | 2.79e-07 | 7.30e-07 | 2.62e-07 | 2.46e-05 | 1.15e-06 | 0.00e+00 | 3.18e-07 |
| I-133 | 2.01e-06 | 3.41e-06 | 1.04e-06 | 4.76e-04 | 5.98e-06 | 0.00e+00 | 2.58e-06 |
| I-134 | 1.46e-07 | 3.87e-07 | 1.39e-07 | 6.45e-06 | 6.10e-07 | 0.00e+00 | 5.10e-09 |
| I-135 | 6.10e-07 | 1.57e-06 | 5.82e-07 | 1.01e-04 | 2.48e-06 | 0.00e+00 | 1.74e-06 |
| Cs-134 | 8.37e-05 | 1.97e-04 | 9.14e-05 | 0.00e+00 | 6.26e-05 | 2.39e-05 | 2.45e-06 |
| Cs-134m | 2.94e-08 | 6.09e-08 | 3.13e-08 | 0.00e+00 | 3.39e-08 | 5.95e-09 | 4.05e-08 |

Conversion factors are in units of mrem per pCi ingested.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Ingestion Dose Conversion factors for Teen age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Cs-135 | 2.78e-05 | 2.55e-05 | 5.96e-06 | 0.00e+00 | 9.73e-06 | 3.52e-06 | 4.46e-07 |
| Cs-136 | 8.59e-06 | 3.38e-05 | 2.27e-05 | 0.00e+00 | 1.84e-05 | 2.90e-06 | 2.72e-06 |
| Cs-137 | 1.12e-04 | 1.49e-04 | 5.19e-05 | 0.00e+00 | 5.07e-05 | 1.97e-05 | 2.12e-06 |
| Cs-138 | 7.76e-08 | 1.49e-07 | 7.45e-08 | 0.00e+00 | 1.10e-07 | 1.28e-08 | 6.76e-11 |
| Cs-139 | 4.87e-08 | 7.17e-08 | 2.63e-08 | 0.00e+00 | 5.79e-08 | 6.34e-09 | 3.33e-23 |
| Ba-139 | 1.39e-07 | 9.78e-11 | 4.05e-09 | 0.00e+00 | 9.22e-11 | 6.74e-11 | 1.24e-06 |
| Ba-140 | 2.84e-05 | 3.48e-08 | 1.83e-06 | 0.00e+00 | 1.18e-08 | 2.34e-08 | 4.38e-05 |
| Ba-141 | 6.71e-08 | 5.01e-11 | 2.24e-09 | 0.00e+00 | 4.65e-11 | 3.43e-11 | 1.43e-13 |
| Ba-142 | 2.99e-08 | 2.99e-11 | 1.84e-09 | 0.00e+00 | 2.53e-11 | 1.99e-11 | 9.18e-20 |
| La-140 | 3.48e-09 | 1.71e-09 | 4.55e-10 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 9.82e-05 |
| La-141 | 4.55e-10 | 1.40e-10 | 2.31e-11 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.48e-05 |
| La-142 | 1.79e-10 | 7.95e-11 | 1.98e-11 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.42e-06 |
| Ce-141 | 1.33e-08 | 8.88e-09 | 1.02e-09 | 0.00e+00 | 4.18e-09 | 0.00e+00 | 2.54e-05 |
| Ce-143 | 2.35e-09 | 1.71e-06 | 1.91e-10 | 0.00e+00 | 7.67e-10 | 0.00e+00 | 5.14e-05 |
| Ce-144 | 6.96e-07 | 2.88e-07 | 3.74e-08 | 0.00e+00 | 1.72e-07 | 0.00e+00 | 1.75e-04 |
| Pr-143 | 1.31e-08 | 5.23e-09 | 6.52e-10 | 0.00e+00 | 3.04e-09 | 0.00e+00 | 4.31e-05 |
| Pr-144 | 4.30e-11 | 1.76e-11 | 2.18e-12 | 0.00e+00 | 1.01e-11 | 0.00e+00 | 4.74e-14 |
| Nd-147 | 9.38e-09 | 1.02e-08 | 6.11e-10 | 0.00e+00 | 5.99e-09 | 0.00e+00 | 3.68e-05 |
| Pm-147 | 1.05e-07 | 9.96e-09 | 4.06e-09 | 0.00e+00 | 1.90e-08 | 0.00e+00 | 9.47e-06 |
| Pm-148 | 1.02e-08 | 1.66e-09 | 8.36e-10 | 0.00e+00 | 3.00e-09 | 0.00e+00 | 9.90e-05 |
| Pm-148m | 4.14e-08 | 1.05e-08 | 8.21e-09 | 0.00e+00 | 1.59e-08 | 0.00e+00 | 6.61e-05 |
| Pm-149 | 2.17e-09 | 3.05e-10 | 1.25e-10 | 0.00e+00 | 5.81e-10 | 0.00e+00 | 4.49e-05 |
| Pm-151 | 9.87e-10 | 1.63e-10 | 8.25e-11 | 0.00e+00 | 2.93e-10 | 0.00e+00 | 3.66e-05 |
| Sm-151 | 8.73e-08 | 1.68e-08 | 3.94e-09 | 0.00e+00 | 1.84e-08 | 0.00e+00 | 5.70e-06 |
| Sm-153 | 1.22e-09 | 1.01e-09 | 7.43e-11 | 0.00e+00 | 3.30e-10 | 0.00e+00 | 2.85e-05 |
| Eu-152 | 2.45e-07 | 5.90e-08 | 5.20e-08 | 0.00e+00 | 2.74e-07 | 0.00e+00 | 2.17e-05 |
| Eu-154 | 7.91e-07 | 1.02e-07 | 7.19e-08 | 0.00e+00 | 4.56e-07 | 0.00e+00 | 5.39e-05 |
| Eu-155 | 1.74e-07 | 1.68e-08 | 1.04e-08 | 0.00e+00 | 6.57e-08 | 0.00e+00 | 9.63e-05 |
| Eu-156 | 1.92e-08 | 1.44e-08 | 2.35e-09 | 0.00e+00 | 9.69e-09 | 0.00e+00 | 7.36e-05 |
| Tb-160 | 6.47e-08 | 0.00e+00 | 8.07e-09 | 0.00e+00 | 2.56e-08 | 0.00e+00 | 4.19e-05 |

Conversion factors are in units of mrem per pCi ingested.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Ingestion Dose Conversion factors for Teen age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ho-166m | 3.57e-07 | 1.10e-07 | 7.96e-08 | 0.00e+00 | 1.61e-07 | 0.00e+00 | 2.71e-05 |
| W-181 | 1.42e-08 | 4.58e-09 | 4.79e-10 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.90e-07 |
| W-185 | 5.79e-07 | 1.91e-07 | 2.02e-08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.65e-05 |
| W-187 | 1.46e-07 | 1.19e-07 | 4.17e-08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.22e-05 |
| Pb-210 | 1.81e-02 | 5.44e-03 | 7.01e-04 | 0.00e+00 | 1.72e-02 | 0.00e+00 | 2.37e-06 |
| Bi-210 | 6.59e-07 | 4.51e-06 | 3.77e-07 | 0.00e+00 | 5.48e-05 | 0.00e+00 | 5.15e-05 |
| Po-210 | 5.09e-04 | 1.07e-03 | 1.23e-04 | 0.00e+00 | 3.60e-03 | 0.00e+00 | 6.75e-05 |
| Ra-223 | 7.11e-03 | 1.08e-05 | 1.42e-03 | 0.00e+00 | 3.10e-04 | 0.00e+00 | 3.43e-04 |
| Ra-224 | 2.31e-03 | 5.52e-06 | 4.61e-04 | 0.00e+00 | 1.58e-04 | 0.00e+00 | 3.71e-04 |
| Ra-225 | 9.37e-03 | 1.10e-05 | 1.87e-03 | 0.00e+00 | 3.15e-04 | 0.00e+00 | 3.27e-04 |
| Ra-226 | 3.22e-01 | 8.13e-06 | 2.39e-01 | 0.00e+00 | 2.32e-04 | 0.00e+00 | 3.51e-04 |
| Ra-228 | 1.37e-01 | 4.41e-06 | 1.51e-01 | 0.00e+00 | 1.26e-04 | 0.00e+00 | 5.98e-05 |
| Ac-225 | 6.29e-06 | 8.59e-06 | 4.22e-07 | 0.00e+00 | 9.85e-07 | 0.00e+00 | 4.36e-04 |
| Ac-227 | 2.05e-03 | 3.03e-04 | 1.22e-04 | 0.00e+00 | 8.81e-05 | 0.00e+00 | 8.68e-05 |
| Th-227 | 1.96e-05 | 3.52e-07 | 5.65e-07 | 0.00e+00 | 2.01e-06 | 0.00e+00 | 5.75e-04 |
| Th-228 | 6.80e-04 | 1.14e-05 | 2.30e-05 | 0.00e+00 | 6.41e-05 | 0.00e+00 | 5.97e-04 |
| Th-229 | 1.43e-02 | 4.11e-04 | 2.37e-04 | 0.00e+00 | 1.99e-03 | 0.00e+00 | 8.28e-05 |
| Th-230 | 2.16e-03 | 1.23e-04 | 6.00e-05 | 0.00e+00 | 5.99e-04 | 0.00e+00 | 6.38e-05 |
| Th-232 | 2.42e-03 | 1.05e-04 | 1.63e-06 | 0.00e+00 | 5.11e-04 | 0.00e+00 | 5.43e-05 |
| Th-234 | 1.14e-07 | 6.68e-09 | 3.31e-09 | 0.00e+00 | 3.81e-08 | 0.00e+00 | 1.21e-04 |
| Pa-231 | 4.31e-03 | 1.62e-04 | 1.68e-04 | 0.00e+00 | 9.10e-04 | 0.00e+00 | 7.60e-05 |
| Pa-233 | 7.33e-09 | 1.41e-09 | 1.26e-09 | 0.00e+00 | 5.32e-09 | 0.00e+00 | 1.61e-05 |
| U-232 | 5.89e-03 | 0.00e+00 | 4.21e-04 | 0.00e+00 | 6.38e-04 | 0.00e+00 | 7.19e-05 |
| U-233 | 1.24e-03 | 0.00e+00 | 7.54e-05 | 0.00e+00 | 2.90e-04 | 0.00e+00 | 6.65e-05 |
| U-234 | 1.19e-03 | 0.00e+00 | 7.39e-05 | 0.00e+00 | 2.85e-04 | 0.00e+00 | 6.51e-05 |
| U-235 | 1.14e-03 | 0.00e+00 | 6.94e-05 | 0.00e+00 | 2.67e-04 | 0.00e+00 | 8.28e-05 |
| U-236 | 1.14e-03 | 0.00e+00 | 7.09e-05 | 0.00e+00 | 2.73e-04 | 0.00e+00 | 6.11e-05 |
| U-237 | 7.89e-08 | 0.00e+00 | 2.10e-08 | 0.00e+00 | 3.24e-07 | 0.00e+00 | 2.09e-05 |
| U-238 | 1.09e-03 | 0.00e+00 | 6.49e-05 | 0.00e+00 | 2.50e-04 | 0.00e+00 | 5.83e-05 |
| Np-237 | 1.33e-03 | 9.55e-05 | 5.85e-05 | 0.00e+00 | 4.33e-04 | 0.00e+00 | 8.41e-05 |

Conversion factors are in units of mrem per pCi ingested.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Ingestion Dose Conversion factors for Teen age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Np-238 | 1.95e-08 | 5.22e-10 | 3.04e-10 | 0.00e+00 | 1.79e-09 | 0.00e+00 | 3.83e-05 |
| Np-239 | 1.76e-09 | 1.66e-10 | 9.22e-11 | 0.00e+00 | 5.21e-10 | 0.00e+00 | 2.67e-05 |
| Pu-238 | 6.70e-04 | 8.58e-05 | 1.82e-05 | 0.00e+00 | 7.80e-05 | 0.00e+00 | 7.73e-05 |
| Pu-239 | 7.65e-04 | 9.29e-05 | 2.01e-05 | 0.00e+00 | 8.57e-05 | 0.00e+00 | 7.06e-05 |
| Pu-240 | 7.64e-04 | 9.27e-05 | 2.01e-05 | 0.00e+00 | 8.56e-05 | 0.00e+00 | 7.19e-05 |
| Pu-241 | 1.75e-05 | 8.40e-07 | 3.69e-07 | 0.00e+00 | 1.71e-06 | 0.00e+00 | 1.48e-06 |
| Pu-242 | 7.09e-04 | 8.94e-05 | 1.94e-05 | 0.00e+00 | 8.25e-05 | 0.00e+00 | 6.92e-05 |
| Pu-244 | 8.28e-04 | 1.02e-04 | 2.22e-05 | 0.00e+00 | 9.45e-05 | 0.00e+00 | 1.03e-04 |
| Am-241 | 7.98e-04 | 7.53e-04 | 5.75e-05 | 0.00e+00 | 4.31e-04 | 0.00e+00 | 7.87e-05 |
| Am-242m | 8.07e-04 | 7.11e-04 | 5.80e-05 | 0.00e+00 | 4.30e-04 | 0.00e+00 | 9.90e-05 |
| Am-243 | 7.96e-04 | 7.35e-04 | 5.62e-05 | 0.00e+00 | 4.22e-04 | 0.00e+00 | 9.23e-05 |
| Cm-242 | 2.94e-05 | 3.10e-05 | 1.95e-06 | 0.00e+00 | 8.89e-06 | 0.00e+00 | 8.40e-05 |
| Cm-243 | 6.50e-04 | 6.03e-04 | 4.09e-05 | 0.00e+00 | 1.91e-04 | 0.00e+00 | 8.28e-05 |
| Cm-244 | 5.04e-04 | 4.77e-04 | 3.19e-05 | 0.00e+00 | 1.49e-04 | 0.00e+00 | 8.00e-05 |
| Cm-245 | 9.90e-04 | 8.71e-04 | 6.10e-05 | 0.00e+00 | 2.85e-04 | 0.00e+00 | 7.46e-05 |
| Cm-246 | 9.82e-04 | 8.70e-04 | 6.09e-05 | 0.00e+00 | 2.84e-04 | 0.00e+00 | 7.33e-05 |
| Cm-247 | 9.57e-04 | 8.57e-04 | 6.00e-05 | 0.00e+00 | 2.80e-04 | 0.00e+00 | 9.63e-05 |
| Cm-248 | 7.95e-03 | 7.06e-03 | 4.95e-04 | 0.00e+00 | 2.31e-03 | 0.00e+00 | 1.55e-03 |
| Cf-252 | 3.47e-04 | 0.00e+00 | 8.37e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.05e-04 |

Conversion factors are in units of mrem per pCi ingested.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Ingestion Dose Conversion factors for Child age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| H-3 | 0.00e+00 | 1.16e-07 | 1.16e-07 | 1.16e-07 | 1.16e-07 | 1.16e-07 | 1.16e-07 |
| Be-10 | 1.35e-05 | 1.57e-06 | 3.39e-07 | 0.00e+00 | 1.11e-06 | 0.00e+00 | 2.75e-05 |
| C-14 | 1.21e-05 | 2.42e-06 | 2.42e-06 | 2.42e-06 | 2.42e-06 | 2.42e-06 | 2.42e-06 |
| N-13 | 3.10e-08 | 3.10e-08 | 3.10e-08 | 3.10e-08 | 3.10e-08 | 3.10e-08 | 3.10e-08 |
| F-18 | 2.49e-06 | 0.00e+00 | 2.47e-07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.74e-07 |
| Na-22 | 5.88e-05 | 5.88e-05 | 5.88e-05 | 5.88e-05 | 5.88e-05 | 5.88e-05 | 5.88e-05 |
| Na-24 | 5.80e-06 | 5.80e-06 | 5.80e-06 | 5.80e-06 | 5.80e-06 | 5.80e-06 | 5.80e-06 |
| P-32 | 8.25e-04 | 3.86e-05 | 3.18e-05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.28e-05 |
| Ca-41 | 3.47e-04 | 0.00e+00 | 3.79e-05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.90e-07 |
| Sc-46 | 1.97e-08 | 2.70e-08 | 1.04e-08 | 0.00e+00 | 2.39e-08 | 0.00e+00 | 3.95e-05 |
| Cr-51 | 0.00e+00 | 0.00e+00 | 8.90e-09 | 4.94e-09 | 1.35e-09 | 9.02e-09 | 4.72e-07 |
| Mn-54 | 0.00e+00 | 1.07e-05 | 2.85e-06 | 0.00e+00 | 3.00e-06 | 0.00e+00 | 8.98e-06 |
| Mn-56 | 0.00e+00 | 3.34e-07 | 7.54e-08 | 0.00e+00 | 4.04e-07 | 0.00e+00 | 4.84e-05 |
| Fe-55 | 1.15e-05 | 6.10e-06 | 1.89e-06 | 0.00e+00 | 0.00e+00 | 3.45e-06 | 1.13e-06 |
| Fe-59 | 1.65e-05 | 2.67e-05 | 1.33e-05 | 0.00e+00 | 0.00e+00 | 7.74e-06 | 2.78e-05 |
| Co-57 | 0.00e+00 | 4.93e-07 | 9.98e-07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.04e-06 |
| Co-58 | 0.00e+00 | 1.80e-06 | 5.51e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.05e-05 |
| Co-60 | 0.00e+00 | 5.29e-06 | 1.56e-05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.93e-05 |
| Ni-59 | 4.02e-05 | 1.07e-05 | 6.82e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.10e-07 |
| Ni-63 | 5.38e-04 | 2.88e-05 | 1.83e-05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.94e-06 |
| Ni-65 | 2.22e-06 | 2.09e-07 | 1.22e-07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.56e-05 |
| Cu-64 | 0.00e+00 | 2.45e-07 | 1.48e-07 | 0.00e+00 | 5.92e-07 | 0.00e+00 | 1.15e-05 |
| Zn-65 | 1.37e-05 | 3.65e-05 | 2.27e-05 | 0.00e+00 | 2.30e-05 | 0.00e+00 | 6.41e-06 |
| Zn-69 | 4.38e-08 | 6.33e-08 | 5.85e-09 | 0.00e+00 | 3.84e-08 | 0.00e+00 | 3.99e-06 |
| Zn-69m | 7.10e-07 | 1.21e-06 | 1.43e-07 | 0.00e+00 | 7.03e-07 | 0.00e+00 | 3.94e-05 |
| Se-79 | 0.00e+00 | 8.43e-06 | 1.87e-06 | 0.00e+00 | 1.37e-05 | 0.00e+00 | 5.53e-07 |
| Br-82 | 0.00e+00 | 0.00e+00 | 7.55e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-83 | 0.00e+00 | 0.00e+00 | 1.71e-07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-84 | 0.00e+00 | 0.00e+00 | 1.98e-07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-85 | 0.00e+00 | 0.00e+00 | 9.12e-09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of mrem per pCi ingested.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Ingestion Dose Conversion factors for Child age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Rb-86 | 0.00e+00 | 6.70e-05 | 4.12e-05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.31e-06 |
| Rb-87 | 0.00e+00 | 3.95e-05 | 1.83e-05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.92e-07 |
| Rb-88 | 0.00e+00 | 1.90e-07 | 1.32e-07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 9.32e-09 |
| Rb-89 | 0.00e+00 | 1.17e-07 | 1.04e-07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.02e-09 |
| Sr-89 | 1.32e-03 | 0.00e+00 | 3.77e-05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.11e-05 |
| Sr-90 | 2.56e-02 | 0.00e+00 | 5.15e-04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.29e-04 |
| Sr-91 | 2.40e-05 | 0.00e+00 | 9.06e-07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.30e-05 |
| Sr-92 | 9.03e-06 | 0.00e+00 | 3.62e-07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.71e-04 |
| Y-90 | 4.11e-08 | 0.00e+00 | 1.10e-09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.17e-04 |
| Y-91 | 6.02e-07 | 0.00e+00 | 1.61e-08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 8.02e-05 |
| Y-91m | 3.82e-10 | 0.00e+00 | 1.39e-11 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.48e-07 |
| Y-92 | 3.60e-09 | 0.00e+00 | 1.03e-10 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.04e-04 |
| Y-93 | 1.14e-08 | 0.00e+00 | 3.13e-10 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.70e-04 |
| Zr-93 | 1.67e-07 | 6.25e-09 | 4.45e-09 | 0.00e+00 | 2.42e-08 | 0.00e+00 | 2.37e-06 |
| Zr-95 | 1.16e-07 | 2.55e-08 | 2.27e-08 | 0.00e+00 | 3.65e-08 | 0.00e+00 | 2.66e-05 |
| Zr-97 | 6.99e-09 | 1.01e-09 | 5.96e-10 | 0.00e+00 | 1.45e-09 | 0.00e+00 | 1.53e-04 |
| Nb-93m | 1.05e-07 | 2.62e-08 | 8.61e-09 | 0.00e+00 | 2.83e-08 | 0.00e+00 | 3.95e-06 |
| Nb-95 | 2.25e-08 | 8.76e-09 | 6.26e-09 | 0.00e+00 | 8.23e-09 | 0.00e+00 | 1.62e-05 |
| Nb-97 | 2.17e-10 | 3.92e-11 | 1.83e-11 | 0.00e+00 | 4.35e-11 | 0.00e+00 | 1.21e-05 |
| Mo-93 | 0.00e+00 | 2.41e-05 | 8.65e-07 | 0.00e+00 | 6.35e-06 | 0.00e+00 | 1.22e-06 |
| Mo-99 | 0.00e+00 | 1.33e-05 | 3.29e-06 | 0.00e+00 | 2.84e-05 | 0.00e+00 | 1.10e-05 |
| Tc-101 | 1.07e-09 | 1.12e-09 | 1.42e-08 | 0.00e+00 | 1.91e-08 | 5.92e-10 | 3.56e-09 |
| Tc-99 | 5.35e-07 | 5.96e-07 | 2.14e-07 | 0.00e+00 | 7.02e-06 | 5.27e-08 | 6.25e-06 |
| Tc-99m | 9.23e-10 | 1.81e-09 | 3.00e-08 | 0.00e+00 | 2.63e-08 | 9.19e-10 | 1.03e-06 |
| Ru-103 | 7.31e-07 | 0.00e+00 | 2.81e-07 | 0.00e+00 | 1.84e-06 | 0.00e+00 | 1.89e-05 |
| Ru-105 | 6.45e-08 | 0.00e+00 | 2.34e-08 | 0.00e+00 | 5.67e-07 | 0.00e+00 | 4.21e-05 |
| Ru-106 | 1.17e-05 | 0.00e+00 | 1.46e-06 | 0.00e+00 | 1.58e-05 | 0.00e+00 | 1.82e-04 |
| Rh-105 | 5.14e-07 | 2.76e-07 | 2.36e-07 | 0.00e+00 | 1.10e-06 | 0.00e+00 | 1.71e-05 |
| Pd-107 | 0.00e+00 | 4.72e-07 | 4.01e-08 | 0.00e+00 | 3.95e-06 | 0.00e+00 | 9.37e-07 |
| Pd-109 | 0.00e+00 | 5.67e-07 | 1.70e-07 | 0.00e+00 | 3.04e-06 | 0.00e+00 | 3.35e-05 |

Conversion factors are in units of mrem per pCi ingested.

Ingestion Dose Conversion factors for Child age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ag-110m | 5.39e-07 | 3.64e-07 | 2.91e-07 | 0.00e+00 | 6.78e-07 | 0.00e+00 | 4.33e-05 |
| Ag-111 | 2.48e-07 | 7.76e-08 | 5.12e-08 | 0.00e+00 | 2.34e-07 | 0.00e+00 | 4.75e-05 |
| Cd-113m | 0.00e+00 | 1.02e-05 | 4.34e-07 | 0.00e+00 | 1.05e-05 | 0.00e+00 | 2.63e-05 |
| Cd-115m | 0.00e+00 | 5.89e-06 | 2.51e-07 | 0.00e+00 | 4.38e-06 | 0.00e+00 | 8.01e-05 |
| Sn-123 | 1.33e-04 | 1.65e-06 | 3.24e-06 | 1.75e-06 | 0.00e+00 | 0.00e+00 | 6.52e-05 |
| Sn-125 | 3.55e-05 | 5.35e-07 | 1.59e-06 | 5.55e-07 | 0.00e+00 | 0.00e+00 | 1.10e-04 |
| Sn-126 | 3.33e-04 | 4.15e-06 | 9.46e-06 | 1.14e-06 | 0.00e+00 | 0.00e+00 | 2.50e-05 |
| Sb-124 | 1.11e-05 | 1.44e-07 | 3.89e-06 | 2.45e-08 | 0.00e+00 | 6.16e-06 | 6.94e-05 |
| Sb-125 | 7.16e-06 | 5.52e-08 | 1.50e-06 | 6.63e-09 | 0.00e+00 | 3.99e-06 | 1.71e-05 |
| Sb-126 | 4.40e-06 | 6.73e-08 | 1.58e-06 | 2.58e-08 | 0.00e+00 | 2.10e-06 | 8.87e-05 |
| Sb-127 | 1.06e-06 | 1.64e-08 | 3.68e-07 | 1.18e-08 | 0.00e+00 | 4.60e-07 | 5.97e-05 |
| Te-125m | 1.14e-05 | 3.09e-06 | 1.52e-06 | 3.20e-06 | 0.00e+00 | 0.00e+00 | 1.10e-05 |
| Te-127 | 4.71e-07 | 1.27e-07 | 1.01e-07 | 3.26e-07 | 1.34e-06 | 0.00e+00 | 1.84e-05 |
| Te-127m | 2.89e-05 | 7.78e-06 | 3.43e-06 | 6.91e-06 | 8.24e-05 | 0.00e+00 | 2.34e-05 |
| Te-129 | 1.34e-07 | 3.74e-08 | 3.18e-08 | 9.56e-08 | 3.92e-07 | 0.00e+00 | 8.34e-06 |
| Te-129m | 4.87e-05 | 1.36e-05 | 7.56e-06 | 1.57e-05 | 1.43e-04 | 0.00e+00 | 5.94e-05 |
| Te-131 | 8.30e-08 | 2.53e-08 | 2.47e-08 | 6.35e-08 | 2.51e-07 | 0.00e+00 | 4.36e-07 |
| Te-131m | 7.20e-06 | 2.49e-06 | 2.65e-06 | 5.12e-06 | 2.41e-05 | 0.00e+00 | 1.01e-04 |
| Te-132 | 1.01e-05 | 4.47e-06 | 5.40e-06 | 6.51e-06 | 4.15e-05 | 0.00e+00 | 4.50e-05 |
| Te-133m | 1.87e-07 | 7.56e-08 | 9.37e-08 | 1.45e-07 | 7.18e-07 | 0.00e+00 | 5.77e-06 |
| Te-134 | 1.29e-07 | 5.80e-08 | 7.74e-08 | 1.02e-07 | 5.37e-07 | 0.00e+00 | 5.89e-07 |
| I-129 | 1.39e-05 | 8.53e-06 | 7.62e-06 | 5.58e-03 | 1.44e-05 | 0.00e+00 | 4.29e-07 |
| I-130 | 2.92e-06 | 5.90e-06 | 3.04e-06 | 6.50e-04 | 8.82e-06 | 0.00e+00 | 2.76e-06 |
| I-131 | 1.72e-05 | 1.73e-05 | 9.83e-06 | 5.72e-03 | 2.84e-05 | 0.00e+00 | 1.54e-06 |
| I-132 | 8.00e-07 | 1.47e-06 | 6.76e-07 | 6.82e-05 | 2.25e-06 | 0.00e+00 | 1.73e-06 |
| I-133 | 5.92e-06 | 7.32e-06 | 2.77e-06 | 1.36e-03 | 1.22e-05 | 0.00e+00 | 2.95e-06 |
| I-134 | 4.19e-07 | 7.78e-07 | 3.58e-07 | 1.79e-05 | 1.19e-06 | 0.00e+00 | 5.16e-07 |
| I-135 | 1.75e-06 | 3.15e-06 | 1.49e-06 | 2.79e-04 | 4.83e-06 | 0.00e+00 | 2.40e-06 |
| Cs-134 | 2.34e-04 | 3.84e-04 | 8.10e-05 | 0.00e+00 | 1.19e-04 | 4.27e-05 | 2.07e-06 |
| Cs-134m | 8.44e-08 | 1.25e-07 | 8.16e-08 | 0.00e+00 | 6.59e-08 | 1.09e-08 | 1.58e-07 |

Conversion factors are in units of mrem per pCi ingested.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Ingestion Dose Conversion factors for Child age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Cs-135 | 8.30e-05 | 5.78e-05 | 5.93e-06 | 0.00e+00 | 2.04e-05 | 6.81e-06 | 4.33e-07 |
| Cs-136 | 2.35e-05 | 6.46e-05 | 4.18e-05 | 0.00e+00 | 3.44e-05 | 5.13e-06 | 2.27e-06 |
| Cs-137 | 3.27e-04 | 3.13e-04 | 4.62e-05 | 0.00e+00 | 1.02e-04 | 3.67e-05 | 1.96e-06 |
| Cs-138 | 2.28e-07 | 3.17e-07 | 2.01e-07 | 0.00e+00 | 2.23e-07 | 2.40e-08 | 1.46e-07 |
| Cs-139 | 1.45e-07 | 1.61e-07 | 7.74e-08 | 0.00e+00 | 1.21e-07 | 1.22e-08 | 1.45e-11 |
| Ba-139 | 4.14e-07 | 2.21e-10 | 1.20e-08 | 0.00e+00 | 1.93e-10 | 1.30e-10 | 2.39e-05 |
| Ba-140 | 8.31e-05 | 7.28e-08 | 4.85e-06 | 0.00e+00 | 2.37e-08 | 4.34e-08 | 4.21e-05 |
| Ba-141 | 2.00e-07 | 1.12e-10 | 6.51e-09 | 0.00e+00 | 9.69e-11 | 6.58e-10 | 1.14e-07 |
| Ba-142 | 8.74e-08 | 6.29e-11 | 4.88e-09 | 0.00e+00 | 5.09e-11 | 3.70e-11 | 1.14e-09 |
| La-140 | 1.01e-08 | 3.53e-09 | 1.19e-09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 9.84e-05 |
| La-141 | 1.36e-09 | 3.17e-10 | 6.88e-11 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.05e-05 |
| La-142 | 5.24e-10 | 1.67e-10 | 5.23e-11 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.31e-05 |
| Ce-141 | 3.97e-08 | 1.98e-08 | 2.94e-09 | 0.00e+00 | 8.68e-09 | 0.00e+00 | 2.47e-05 |
| Ce-143 | 6.99e-09 | 3.79e-06 | 5.49e-10 | 0.00e+00 | 1.59e-09 | 0.00e+00 | 5.55e-05 |
| Ce-144 | 2.08e-06 | 6.52e-07 | 1.11e-07 | 0.00e+00 | 3.61e-07 | 0.00e+00 | 1.70e-04 |
| Pr-143 | 3.93e-08 | 1.18e-08 | 1.95e-09 | 0.00e+00 | 6.39e-09 | 0.00e+00 | 4.24e-05 |
| Pr-144 | 1.29e-10 | 3.99e-11 | 6.49e-12 | 0.00e+00 | 2.11e-11 | 0.00e+00 | 8.59e-08 |
| Nd-147 | 2.79e-08 | 2.26e-08 | 1.75e-09 | 0.00e+00 | 1.24e-08 | 0.00e+00 | 3.58e-05 |
| Pm-147 | 3.18e-07 | 2.27e-08 | 1.22e-08 | 0.00e+00 | 4.01e-08 | 0.00e+00 | 9.19e-06 |
| Pm-148 | 3.02e-08 | 3.63e-09 | 2.35e-09 | 0.00e+00 | 6.17e-09 | 0.00e+00 | 9.70e-05 |
| Pm-148m | 1.03e-07 | 2.05e-08 | 2.05e-08 | 0.00e+00 | 3.04e-08 | 0.00e+00 | 5.78e-05 |
| Pm-149 | 6.49e-09 | 6.90e-10 | 3.74e-10 | 0.00e+00 | 1.22e-09 | 0.00e+00 | 4.71e-05 |
| Pm-151 | 2.92e-09 | 3.55e-10 | 2.31e-10 | 0.00e+00 | 6.02e-10 | 0.00e+00 | 4.03e-05 |
| Sm-151 | 2.56e-07 | 3.81e-08 | 1.20e-08 | 0.00e+00 | 3.94e-08 | 0.00e+00 | 5.53e-06 |
| Sm-153 | 3.65e-09 | 2.27e-09 | 2.19e-10 | 0.00e+00 | 6.91e-10 | 0.00e+00 | 3.02e-05 |
| Eu-152 | 6.15e-07 | 1.12e-07 | 1.33e-07 | 0.00e+00 | 4.73e-07 | 0.00e+00 | 1.84e-05 |
| Eu-154 | 2.30e-06 | 2.07e-07 | 1.89e-07 | 0.00e+00 | 9.09e-07 | 0.00e+00 | 4.81e-05 |
| Eu-155 | 4.82e-07 | 3.47e-08 | 2.72e-08 | 0.00e+00 | 1.30e-07 | 0.00e+00 | 8.69e-05 |
| Eu-156 | 5.62e-08 | 3.01e-08 | 6.23e-09 | 0.00e+00 | 1.94e-08 | 0.00e+00 | 6.83e-05 |
| Tb-160 | 1.66e-07 | 0.00e+00 | 2.06e-08 | 0.00e+00 | 4.94e-08 | 0.00e+00 | 3.68e-05 |

Conversion factors are in units of mrem per pCi ingested.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Ingestion Dose Conversion factors for Child age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ho-166m | 1.08e-06 | 2.26e-07 | 1.91e-07 | 0.00e+00 | 3.22e-07 | 0.00e+00 | 2.63e-05 |
| W-181 | 4.23e-08 | 1.04e-08 | 1.43e-09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.79e-07 |
| W-185 | 1.73e-06 | 4.32e-07 | 6.05e-08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.61e-05 |
| W-187 | 4.29e-07 | 2.54e-07 | 1.14e-07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.57e-05 |
| Pb-210 | 4.75e-02 | 1.22e-02 | 2.09e-03 | 0.00e+00 | 3.67e-02 | 0.00e+00 | 2.30e-06 |
| Bi-210 | 1.97e-06 | 1.02e-05 | 1.13e-06 | 0.00e+00 | 1.15e-04 | 0.00e+00 | 5.17e-05 |
| Po-210 | 1.52e-03 | 2.43e-03 | 3.67e-04 | 0.00e+00 | 7.56e-03 | 0.00e+00 | 6.55e-05 |
| Ra-223 | 2.12e-02 | 2.45e-05 | 4.24e-03 | 0.00e+00 | 6.50e-04 | 0.00e+00 | 3.38e-04 |
| Ra-224 | 6.89e-03 | 1.25e-05 | 1.38e-03 | 0.00e+00 | 3.31e-04 | 0.00e+00 | 3.78e-04 |
| Ra-225 | 2.80e-02 | 2.50e-05 | 5.59e-03 | 0.00e+00 | 6.62e-04 | 0.00e+00 | 3.21e-04 |
| Ra-226 | 5.75e-01 | 1.84e-05 | 4.72e-01 | 0.00e+00 | 4.88e-04 | 0.00e+00 | 3.41e-04 |
| Ra-228 | 3.85e-01 | 9.99e-06 | 4.32e-01 | 0.00e+00 | 2.65e-04 | 0.00e+00 | 5.81e-05 |
| Ac-225 | 1.88e-05 | 1.94e-05 | 1.26e-06 | 0.00e+00 | 2.07e-06 | 0.00e+00 | 4.31e-04 |
| Ac-227 | 4.12e-03 | 6.63e-04 | 2.55e-04 | 0.00e+00 | 1.46e-04 | 0.00e+00 | 8.43e-05 |
| Th-227 | 5.85e-05 | 7.96e-07 | 1.69e-06 | 0.00e+00 | 4.22e-06 | 0.00e+00 | 5.63e-04 |
| Th-228 | 2.07e-03 | 2.65e-05 | 7.00e-05 | 0.00e+00 | 1.38e-04 | 0.00e+00 | 5.79e-04 |
| Th-229 | 2.35e-02 | 5.91e-04 | 3.92e-04 | 0.00e+00 | 2.89e-03 | 0.00e+00 | 8.04e-05 |
| Th-230 | 3.55e-03 | 1.78e-04 | 9.91e-05 | 0.00e+00 | 8.67e-04 | 0.00e+00 | 6.19e-05 |
| Th-232 | 3.96e-03 | 1.52e-04 | 3.01e-06 | 0.00e+00 | 7.41e-04 | 0.00e+00 | 5.27e-05 |
| Th-234 | 3.42e-07 | 1.51e-08 | 9.88e-09 | 0.00e+00 | 8.01e-08 | 0.00e+00 | 1.18e-04 |
| Pa-231 | 7.07e-03 | 2.34e-04 | 2.81e-04 | 0.00e+00 | 1.28e-03 | 0.00e+00 | 7.37e-05 |
| Pa-233 | 1.81e-08 | 2.82e-09 | 3.16e-09 | 0.00e+00 | 1.04e-08 | 0.00e+00 | 1.44e-05 |
| U-232 | 1.76e-02 | 0.00e+00 | 1.26e-03 | 0.00e+00 | 1.34e-03 | 0.00e+00 | 6.98e-05 |
| U-233 | 3.72e-03 | 0.00e+00 | 2.25e-04 | 0.00e+00 | 6.10e-04 | 0.00e+00 | 6.45e-05 |
| U-234 | 3.57e-03 | 0.00e+00 | 2.21e-04 | 0.00e+00 | 5.98e-04 | 0.00e+00 | 6.32e-05 |
| U-235 | 3.42e-03 | 0.00e+00 | 2.07e-04 | 0.00e+00 | 5.61e-04 | 0.00e+00 | 8.03e-05 |
| U-236 | 3.42e-03 | 0.00e+00 | 2.12e-04 | 0.00e+00 | 5.73e-04 | 0.00e+00 | 5.92e-05 |
| U-237 | 2.36e-07 | 0.00e+00 | 6.27e-08 | 0.00e+00 | 6.81e-07 | 0.00e+00 | 2.08e-05 |
| U-238 | 3.27e-03 | 0.00e+00 | 1.94e-04 | 0.00e+00 | 5.24e-04 | 0.00e+00 | 5.66e-05 |
| Np-237 | 2.23e-03 | 1.47e-04 | 9.79e-05 | 0.00e+00 | 6.05e-04 | 0.00e+00 | 8.16e-05 |

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# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Ingestion Dose Conversion factors for Child age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Np-238 | 5.83e-08 | 1.18e-09 | 9.08e-10 | 0.00e+00 | 3.76e-09 | 0.00e+00 | 4.04e-05 |
| Np-239 | 5.25e-09 | 3.77e-10 | 2.65e-10 | 0.00e+00 | 1.09e-09 | 0.00e+00 | 2.79e-05 |
| Pu-238 | 1.19e-03 | 1.38e-04 | 3.16e-05 | 0.00e+00 | 1.15e-04 | 0.00e+00 | 7.50e-05 |
| Pu-239 | 1.29e-03 | 1.38e-04 | 3.31e-05 | 0.00e+00 | 1.22e-04 | 0.00e+00 | 6.85e-05 |
| Pu-240 | 1.28e-03 | 1.43e-04 | 3.31e-05 | 0.00e+00 | 1.22e-04 | 0.00e+00 | 6.98e-05 |
| Pu-241 | 3.87e-05 | 1.58e-06 | 8.04e-07 | 0.00e+00 | 2.96e-06 | 0.00e+00 | 1.44e-06 |
| Pu-242 | 1.19e-03 | 1.38e-04 | 3.19e-05 | 0.00e+00 | 1.17e-04 | 0.00e+00 | 6.71e-05 |
| Pu-244 | 1.39e-03 | 1.58e-03 | 3.65e-05 | 0.00e+00 | 1.35e-04 | 0.00e+00 | 1.00e-04 |
| Am-241 | 1.36e-03 | 1.17e-03 | 1.02e-04 | 0.00e+00 | 6.23e-04 | 0.00e+00 | 7.64e-05 |
| Am-242m | 1.40e-03 | 1.12e-03 | 1.04e-04 | 0.00e+00 | 6.30e-04 | 0.00e+00 | 9.61e-05 |
| Am-243 | 1.34e-03 | 1.13e-03 | 9.83e-05 | 0.00e+00 | 6.06e-04 | 0.00e+00 | 8.95e-05 |
| Cm-242 | 8.78e-05 | 7.01e-05 | 5.84e-06 | 0.00e+00 | 1.87e-05 | 0.00e+00 | 8.16e-05 |
| Cm-243 | 1.28e-03 | 1.04e-03 | 8.24e-05 | 0.00e+00 | 3.08e-04 | 0.00e+00 | 8.03e-05 |
| Cm-244 | 1.08e-03 | 8.74e-04 | 6.93e-05 | 0.00e+00 | 2.54e-04 | 0.00e+00 | 7.77e-05 |
| Cm-245 | 1.67e-03 | 1.34e-03 | 1.05e-04 | 0.00e+00 | 4.11e-04 | 0.00e+00 | 7.24e-05 |
| Cm-246 | 1.65e-03 | 1.34e-03 | 1.05e-04 | 0.00e+00 | 4.10e-04 | 0.00e+00 | 7.11e-05 |
| Cm-247 | 1.61e-03 | 1.32e-03 | 1.03e-04 | 0.00e+00 | 4.04e-04 | 0.00e+00 | 9.35e-05 |
| Cm-248 | 1.34e-02 | 1.09e-02 | 8.52e-04 | 0.00e+00 | 3.33e-03 | 0.00e+00 | 1.51e-03 |
| Cf-252 | 1.05e-03 | 0.00e+00 | 2.54e-05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.96e-04 |

Conversion factors are in units of mrem per pCi ingested.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Ingestion Dose Conversion factors for Infant age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| H-3 | 0.00e+00 | 1.76e-07 | 1.76e-07 | 1.76e-07 | 1.76e-07 | 1.76e-07 | 1.76e-07 |
| Be-10 | 1.71e-05 | 2.49e-06 | 5.16e-07 | 0.00e+00 | 1.64e-06 | 0.00e+00 | 2.78e-05 |
| C-14 | 2.37e-05 | 5.06e-06 | 5.06e-06 | 5.06e-06 | 5.06e-06 | 5.06e-06 | 5.06e-06 |
| N-13 | 5.85e-08 | 5.85e-08 | 5.85e-08 | 5.85e-08 | 5.85e-08 | 5.85e-08 | 5.85e-08 |
| F-18 | 5.19e-06 | 0.00e+00 | 4.43e-07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.22e-06 |
| Na-22 | 9.83e-05 | 9.83e-05 | 9.83e-05 | 9.83e-05 | 9.83e-05 | 9.83e-05 | 9.83e-05 |
| Na-24 | 1.01e-05 | 1.01e-05 | 1.01e-05 | 1.01e-05 | 1.01e-05 | 1.01e-05 | 1.01e-05 |
| P-32 | 1.70e-03 | 1.00e-04 | 6.59e-05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.30e-05 |
| Ca-41 | 3.74e-04 | 0.00e+00 | 4.08e-05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.91e-07 |
| Sc-46 | 3.75e-08 | 5.41e-08 | 1.69e-08 | 0.00e+00 | 3.56e-08 | 0.00e+00 | 3.53e-05 |
| Cr-51 | 0.00e+00 | 0.00e+00 | 1.41e-08 | 9.20e-09 | 2.01e-09 | 1.79e-08 | 4.11e-07 |
| Mn-54 | 0.00e+00 | 1.99e-05 | 4.51e-06 | 0.00e+00 | 4.41e-06 | 0.00e+00 | 7.31e-06 |
| Mn-56 | 0.00e+00 | 8.18e-07 | 1.41e-07 | 0.00e+00 | 7.03e-07 | 0.00e+00 | 7.43e-05 |
| Fe-55 | 1.39e-05 | 8.98e-06 | 2.40e-06 | 0.00e+00 | 0.00e+00 | 4.39e-06 | 1.14e-06 |
| Fe-59 | 3.08e-05 | 5.38e-05 | 2.12e-05 | 0.00e+00 | 0.00e+00 | 1.59e-05 | 2.57e-05 |
| Co-57 | 0.00e+00 | 1.15e-06 | 1.87e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.92e-06 |
| Co-58 | 0.00e+00 | 3.60e-06 | 8.98e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 8.97e-06 |
| Co-60 | 0.00e+00 | 1.08e-05 | 2.55e-05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.57e-05 |
| Ni-59 | 4.73e-05 | 1.45e-05 | 8.17e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 7.16e-07 |
| Ni-63 | 6.34e-04 | 3.92e-05 | 2.20e-05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.95e-06 |
| Ni-65 | 4.70e-06 | 5.32e-07 | 2.42e-07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.05e-05 |
| Cu-64 | 0.00e+00 | 6.09e-07 | 2.82e-07 | 0.00e+00 | 1.03e-06 | 0.00e+00 | 1.25e-05 |
| Zn-65 | 1.84e-05 | 6.31e-05 | 2.91e-05 | 0.00e+00 | 3.06e-05 | 0.00e+00 | 5.33e-05 |
| Zn-69 | 9.33e-08 | 1.68e-07 | 1.25e-08 | 0.00e+00 | 6.98e-08 | 0.00e+00 | 1.37e-05 |
| Zn-69m | 1.50e-06 | 3.06e-06 | 2.79e-07 | 0.00e+00 | 1.24e-06 | 0.00e+00 | 4.24e-05 |
| Se-79 | 0.00e+00 | 2.10e-05 | 3.90e-06 | 0.00e+00 | 2.43e-05 | 0.00e+00 | 5.58e-07 |
| Br-82 | 0.00e+00 | 0.00e+00 | 1.27e-05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-83 | 0.00e+00 | 0.00e+00 | 3.63e-07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-84 | 0.00e+00 | 0.00e+00 | 3.82e-07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |
| Br-85 | 0.00e+00 | 0.00e+00 | 1.94e-08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 0.00e+00 |

Conversion factors are in units of mrem per pCi ingested.

Ingestion Dose Conversion factors for Infant age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Rb-86 | 0.00e+00 | 1.70e-04 | 8.40e-05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.35e-06 |
| Rb-87 | 0.00e+00 | 8.88e-05 | 3.52e-05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.98e-07 |
| Rb-88 | 0.00e+00 | 4.98e-07 | 2.73e-07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 4.85e-07 |
| Rb-89 | 0.00e+00 | 2.86e-07 | 1.97e-07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 9.74e-08 |
| Sr-89 | 2.51e-03 | 0.00e+00 | 7.20e-05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.16e-05 |
| Sr-90 | 2.83e-02 | 0.00e+00 | 5.74e-04 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.31e-04 |
| Sr-91 | 5.00e-05 | 0.00e+00 | 1.81e-06 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 5.92e-05 |
| Sr-92 | 1.92e-05 | 0.00e+00 | 7.13e-07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.07e-04 |
| Y-90 | 8.69e-08 | 0.00e+00 | 2.33e-09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.20e-04 |
| Y-91 | 1.13e-06 | 0.00e+00 | 3.01e-08 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 8.10e-05 |
| Y-91m | 8.10e-10 | 0.00e+00 | 2.76e-11 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.70e-06 |
| Y-92 | 7.65e-09 | 0.00e+00 | 2.15e-10 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.46e-04 |
| Y-93 | 2.43e-08 | 0.00e+00 | 6.62e-10 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.92e-04 |
| Zr-93 | 1.93e-07 | 9.19e-09 | 5.54e-09 | 0.00e+00 | 2.71e-08 | 0.00e+00 | 2.39e-06 |
| Zr-95 | 2.06e-07 | 5.02e-08 | 3.56e-08 | 0.00e+00 | 5.41e-08 | 0.00e+00 | 2.50e-05 |
| Zr-97 | 1.48e-08 | 2.54e-09 | 1.16e-09 | 0.00e+00 | 2.56e-09 | 0.00e+00 | 1.62e-04 |
| Nb-93m | 1.23e-07 | 3.33e-08 | 1.04e-08 | 0.00e+00 | 3.25e-08 | 0.00e+00 | 3.98e-06 |
| Nb-95 | 4.20e-08 | 1.73e-08 | 1.00e-08 | 0.00e+00 | 1.24e-08 | 0.00e+00 | 1.46e-05 |
| Nb-97 | 4.59e-10 | 9.79e-11 | 3.53e-11 | 0.00e+00 | 7.65e-11 | 0.00e+00 | 3.09e-05 |
| Mo-93 | 0.00e+00 | 5.65e-05 | 1.82e-06 | 0.00e+00 | 1.13e-05 | 0.00e+00 | 1.21e-06 |
| Mo-99 | 0.00e+00 | 3.40e-05 | 6.63e-06 | 0.00e+00 | 5.08e-05 | 0.00e+00 | 1.12e-05 |
| Tc-101 | 2.27e-09 | 2.86e-09 | 2.83e-08 | 0.00e+00 | 3.40e-08 | 1.56e-09 | 4.86e-07 |
| Tc-99 | 1.08e-06 | 1.46e-06 | 4.55e-07 | 0.00e+00 | 1.23e-05 | 1.42e-07 | 6.31e-06 |
| Tc-99m | 1.92e-09 | 3.96e-09 | 5.10e-08 | 0.00e+00 | 4.26e-08 | 2.07e-09 | 1.15e-06 |
| Ru-103 | 1.48e-06 | 0.00e+00 | 4.95e-07 | 0.00e+00 | 3.08e-06 | 0.00e+00 | 1.80e-05 |
| Ru-105 | 1.36e-07 | 0.00e+00 | 4.58e-08 | 0.00e+00 | 1.00e-06 | 0.00e+00 | 5.41e-05 |
| Ru-106 | 2.41e-05 | 0.00e+00 | 3.01e-06 | 0.00e+00 | 2.85e-05 | 0.00e+00 | 1.83e-04 |
| Rh-105 | 1.09e-06 | 7.13e-07 | 4.79e-07 | 0.00e+00 | 1.98e-06 | 0.00e+00 | 1.77e-05 |
| Pd-107 | 0.00e+00 | 1.19e-06 | 8.45e-08 | 0.00e+00 | 6.79e-06 | 0.00e+00 | 9.46e-07 |
| Pd-109 | 0.00e+00 | 1.50e-06 | 3.62e-07 | 0.00e+00 | 5.51e-06 | 0.00e+00 | 3.68e-05 |

Conversion factors are in units of mrem per pCi ingested.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Ingestion Dose Conversion factors for Infant age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ag-110m | 9.96e-07 | 7.27e-07 | 4.81e-07 | 0.00e+00 | 1.04e-06 | 0.00e+00 | 3.77e-05 |
| Ag-111 | 5.20e-07 | 2.02e-07 | 1.07e-07 | 0.00e+00 | 4.22e-07 | 0.00e+00 | 4.82e-05 |
| Cd-113m | 0.00e+00 | 1.77e-05 | 6.52e-07 | 0.00e+00 | 1.34e-05 | 0.00e+00 | 2.66e-05 |
| Cd-115m | 0.00e+00 | 1.42e-05 | 4.93e-07 | 0.00e+00 | 7.41e-06 | 0.00e+00 | 8.09e-05 |
| Sn-123 | 2.49e-04 | 3.89e-06 | 6.50e-06 | 3.91e-06 | 0.00e+00 | 0.00e+00 | 6.58e-05 |
| Sn-125 | 7.41e-05 | 1.38e-06 | 3.29e-06 | 1.36e-06 | 0.00e+00 | 0.00e+00 | 1.11e-04 |
| Sn-126 | 5.53e-04 | 7.26e-06 | 1.80e-05 | 1.91e-06 | 0.00e+00 | 0.00e+00 | 2.52e-05 |
| Sb-124 | 2.14e-05 | 3.15e-07 | 6.63e-06 | 5.68e-08 | 0.00e+00 | 1.34e-05 | 6.60e-05 |
| Sb-125 | 1.23e-05 | 1.19e-07 | 2.53e-06 | 1.54e-08 | 0.00e+00 | 7.12e-06 | 1.64e-05 |
| Sb-126 | 8.06e-06 | 1.58e-07 | 2.91e-06 | 6.19e-08 | 0.00e+00 | 5.07e-06 | 8.35e-05 |
| Sb-127 | 2.23e-06 | 3.98e-08 | 6.90e-07 | 2.84e-08 | 0.00e+00 | 1.15e-06 | 5.91e-05 |
| Te-125m | 2.33e-05 | 7.79e-06 | 3.15e-06 | 7.84e-06 | 0.00e+00 | 0.00e+00 | 1.11e-05 |
| Te-127 | 1.00e-06 | 3.35e-07 | 2.15e-07 | 8.14e-07 | 2.44e-06 | 0.00e+00 | 2.10e-05 |
| Te-127m | 5.85e-05 | 1.94e-05 | 7.08e-06 | 1.69e-05 | 1.44e-04 | 0.00e+00 | 2.36e-05 |
| Te-129 | 2.84e-07 | 9.79e-08 | 6.63e-08 | 2.38e-07 | 7.07e-07 | 0.00e+00 | 2.27e-05 |
| Te-129m | 1.00e-04 | 3.43e-05 | 1.54e-05 | 3.84e-05 | 2.50e-04 | 0.00e+00 | 5.97e-05 |
| Te-131 | 1.76e-07 | 6.50e-08 | 4.94e-08 | 1.57e-07 | 4.50e-07 | 0.00e+00 | 7.11e-06 |
| Te-131m | 1.52e-05 | 6.12e-06 | 5.05e-06 | 1.24e-05 | 4.21e-05 | 0.00e+00 | 1.03e-04 |
| Te-132 | 2.08e-05 | 1.03e-05 | 9.61e-06 | 1.52e-05 | 6.44e-05 | 0.00e+00 | 3.81e-05 |
| Te-133m | 3.91e-07 | 1.79e-07 | 1.71e-07 | 3.45e-07 | 1.22e-06 | 0.00e+00 | 1.93e-05 |
| Te-134 | 2.67e-07 | 1.34e-07 | 1.38e-07 | 2.39e-07 | 9.03e-07 | 0.00e+00 | 3.06e-06 |
| I-129 | 2.86e-05 | 2.12e-05 | 1.55e-05 | 1.36e-02 | 2.51e-05 | 0.00e+00 | 4.24e-07 |
| I-130 | 6.00e-06 | 1.32e-05 | 5.30e-06 | 1.48e-03 | 1.45e-05 | 0.00e+00 | 2.83e-06 |
| I-131 | 3.59e-05 | 4.23e-05 | 1.86e-05 | 1.39e-02 | 4.94e-05 | 0.00e+00 | 1.51e-06 |
| I-132 | 1.66e-06 | 3.37e-06 | 1.20e-06 | 1.58e-04 | 3.76e-06 | 0.00e+00 | 2.73e-06 |
| I-133 | 1.25e-05 | 1.82e-05 | 5.33e-06 | 3.31e-03 | 2.14e-05 | 0.00e+00 | 3.08e-06 |
| I-134 | 8.69e-07 | 1.78e-06 | 6.33e-07 | 4.15e-05 | 1.99e-06 | 0.00e+00 | 1.84e-06 |
| I-135 | 3.64e-06 | 7.24e-06 | 2.64e-06 | 6.49e-04 | 8.07e-06 | 0.00e+00 | 2.62e-06 |
| Cs-134 | 3.77e-04 | 7.03e-04 | 7.10e-05 | 0.00e+00 | 1.81e-04 | 7.42e-05 | 1.91e-06 |
| Cs-134m | 1.76e-07 | 2.93e-07 | 1.48e-07 | 0.00e+00 | 1.13e-07 | 2.60e-08 | 2.32e-07 |

Conversion factors are in units of mrem per pCi ingested.

Ingestion Dose Conversion factors for Infant age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Cs-135 | 1.33e-04 | 1.21e-04 | 6.30e-06 | 0.00e+00 | 3.44e-05 | 1.31e-05 | 4.37e-07 |
| Cs-136 | 4.59e-05 | 1.35e-04 | 5.04e-05 | 0.00e+00 | 5.38e-05 | 1.10e-05 | 2.05e-06 |
| Cs-137 | 5.22e-04 | 6.11e-04 | 4.33e-05 | 0.00e+00 | 1.64e-04 | 6.64e-05 | 1.91e-06 |
| Cs-138 | 4.81e-07 | 7.82e-07 | 3.79e-07 | 0.00e+00 | 3.90e-07 | 6.09e-08 | 1.25e-06 |
| Cs-139 | 3.10e-07 | 4.24e-07 | 1.62e-07 | 0.00e+00 | 2.19e-07 | 3.30e-08 | 2.66e-08 |
| Ba-139 | 8.81e-07 | 5.84e-10 | 2.55e-08 | 0.00e+00 | 3.51e-10 | 3.54e-10 | 5.58e-05 |
| Ba-140 | 1.71e-04 | 1.71e-07 | 8.81e-06 | 0.00e+00 | 4.06e-08 | 1.05e-07 | 4.20e-05 |
| Ba-141 | 4.25e-07 | 2.91e-10 | 1.34e-08 | 0.00e+00 | 1.75e-10 | 1.77e-10 | 5.19e-06 |
| Ba-142 | 1.84e-07 | 1.53e-10 | 9.06e-09 | 0.00e+00 | 8.81e-11 | 9.26e-11 | 7.59e-07 |
| La-140 | 2.11e-08 | 8.32e-09 | 2.14e-09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 9.77e-05 |
| La-141 | 2.89e-09 | 8.38e-10 | 1.46e-10 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 9.61e-05 |
| La-142 | 1.10e-09 | 4.04e-10 | 9.67e-11 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 6.86e-05 |
| Ce-141 | 7.87e-08 | 4.80e-08 | 5.65e-09 | 0.00e+00 | 1.48e-08 | 0.00e+00 | 2.48e-05 |
| Ce-143 | 1.48e-08 | 9.82e-06 | 1.12e-09 | 0.00e+00 | 2.86e-09 | 0.00e+00 | 5.73e-05 |
| Ce-144 | 2.98e-06 | 1.22e-06 | 1.67e-07 | 0.00e+00 | 4.93e-07 | 0.00e+00 | 1.71e-04 |
| Pr-143 | 8.13e-08 | 3.04e-08 | 4.03e-09 | 0.00e+00 | 1.13e-08 | 0.00e+00 | 4.29e-05 |
| Pr-144 | 2.74e-10 | 1.06e-10 | 1.38e-11 | 0.00e+00 | 3.84e-11 | 0.00e+00 | 4.93e-06 |
| Nd-147 | 5.53e-08 | 5.68e-08 | 3.48e-09 | 0.00e+00 | 2.19e-08 | 0.00e+00 | 3.60e-05 |
| Pm-147 | 3.88e-07 | 3.27e-08 | 1.59e-08 | 0.00e+00 | 4.88e-08 | 0.00e+00 | 9.27e-06 |
| Pm-148 | 6.32e-08 | 9.13e-09 | 4.60e-09 | 0.00e+00 | 1.09e-08 | 0.00e+00 | 9.74e-05 |
| Pm-148m | 1.65e-07 | 4.18e-08 | 3.28e-08 | 0.00e+00 | 4.80e-08 | 0.00e+00 | 5.44e-05 |
| Pm-149 | 1.38e-08 | 1.81e-09 | 7.90e-10 | 0.00e+00 | 2.20e-09 | 0.00e+00 | 4.86e-05 |
| Pm-151 | 6.18e-09 | 9.01e-10 | 4.56e-10 | 0.00e+00 | 1.07e-09 | 0.00e+00 | 4.17e-05 |
| Sm-151 | 2.90e-07 | 6.67e-08 | 1.44e-08 | 0.00e+00 | 4.53e-08 | 0.00e+00 | 5.58e-06 |
| Sm-153 | 7.72e-09 | 5.97e-09 | 4.58e-10 | 0.00e+00 | 1.25e-09 | 0.00e+00 | 3.12e-05 |
| Eu-152 | 6.74e-07 | 1.79e-07 | 1.51e-07 | 0.00e+00 | 5.02e-07 | 0.00e+00 | 1.59e-05 |
| Eu-154 | 2.64e-06 | 3.67e-07 | 2.20e-07 | 0.00e+00 | 9.95e-07 | 0.00e+00 | 4.58e-05 |
| Eu-155 | 5.42e-07 | 6.25e-08 | 3.23e-08 | 0.00e+00 | 1.40e-07 | 0.00e+00 | 8.37e-05 |
| Eu-156 | 1.14e-07 | 7.06e-08 | 1.12e-08 | 0.00e+00 | 3.26e-08 | 0.00e+00 | 6.67e-05 |
| Tb-160 | 2.59e-07 | 0.00e+00 | 3.24e-08 | 0.00e+00 | 7.37e-08 | 0.00e+00 | 3.45e-05 |

Conversion factors are in units of mrem per pCi ingested.

Ingestion Dose Conversion factors for Infant age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Ho-166m | 1.25e-06 | 2.69e-07 | 2.13e-07 | 0.00e+00 | 3.57e-07 | 0.00e+00 | 2.66e-05 |
| W-181 | 8.85e-08 | 2.72e-08 | 3.04e-09 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.82e-07 |
| W-185 | 3.62e-06 | 1.13e-06 | 1.29e-07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 1.62e-05 |
| W-187 | 9.03e-07 | 6.28e-07 | 2.17e-07 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 3.69e-05 |
| Pb-210 | 5.28e-02 | 1.42e-02 | 2.38e-03 | 0.00e+00 | 4.33e-02 | 0.00e+00 | 2.32e-06 |
| Bi-210 | 4.16e-06 | 2.68e-05 | 2.39e-06 | 0.00e+00 | 2.08e-04 | 0.00e+00 | 5.27e-05 |
| Po-210 | 3.10e-03 | 5.93e-03 | 7.41e-04 | 0.00e+00 | 1.26e-02 | 0.00e+00 | 6.61e-05 |
| Ra-223 | 4.41e-02 | 6.42e-05 | 8.82e-03 | 0.00e+00 | 1.17e-03 | 0.00e+00 | 3.43e-04 |
| Ra-224 | 1.46e-02 | 3.29e-05 | 2.91e-03 | 0.00e+00 | 6.00e-04 | 0.00e+00 | 3.86e-04 |
| Ra-225 | 5.78e-02 | 6.52e-05 | 1.15e-02 | 0.00e+00 | 1.19e-03 | 0.00e+00 | 3.24e-04 |
| Ra-226 | 6.20e-01 | 4.76e-05 | 5.14e-01 | 0.00e+00 | 8.71e-04 | 0.00e+00 | 3.44e-04 |
| Ra-228 | 4.32e-01 | 2.58e-05 | 4.86e-01 | 0.00e+00 | 4.73e-04 | 0.00e+00 | 5.86e-05 |
| Ac-225 | 3.92e-05 | 5.03e-05 | 2.63e-06 | 0.00e+00 | 3.69e-06 | 0.00e+00 | 4.36e-04 |
| Ac-227 | 4.49e-03 | 7.67e-04 | 2.79e-04 | 0.00e+00 | 1.56e-04 | 0.00e+00 | 8.50e-05 |
| Th-227 | 1.20e-04 | 2.01e-06 | 3.45e-06 | 0.00e+00 | 7.41e-06 | 0.00e+00 | 5.70e-04 |
| Th-228 | 2.47e-03 | 3.38e-05 | 8.36e-05 | 0.00e+00 | 1.58e-04 | 0.00e+00 | 5.84e-04 |
| Th-229 | 2.52e-02 | 6.33e-04 | 4.20e-04 | 0.00e+00 | 3.03e-03 | 0.00e+00 | 8.10e-05 |
| Th-230 | 3.80e-03 | 1.90e-04 | 1.06e-04 | 0.00e+00 | 9.12e-04 | 0.00e+00 | 6.24e-05 |
| Th-232 | 4.24e-03 | 1.63e-04 | 1.65e-06 | 0.00e+00 | 7.79e-04 | 0.00e+00 | 5.31e-05 |
| Th-234 | 6.92e-07 | 3.77e-08 | 2.00e-08 | 0.00e+00 | 1.39e-07 | 0.00e+00 | 1.19e-04 |
| Pa-231 | 7.57e-03 | 2.50e-04 | 3.02e-04 | 0.00e+00 | 1.34e-03 | 0.00e+00 | 7.44e-05 |
| Pa-233 | 3.11e-08 | 6.09e-09 | 5.43e-09 | 0.00e+00 | 1.67e-08 | 0.00e+00 | 1.46e-05 |
| U-232 | 2.42e-02 | 0.00e+00 | 2.16e-03 | 0.00e+00 | 2.37e-03 | 0.00e+00 | 7.04e-05 |
| U-233 | 5.08e-03 | 0.00e+00 | 3.87e-04 | 0.00e+00 | 1.08e-03 | 0.00e+00 | 6.51e-05 |
| U-234 | 4.88e-03 | 0.00e+00 | 3.80e-04 | 0.00e+00 | 1.06e-03 | 0.00e+00 | 6.37e-05 |
| U-235 | 4.67e-03 | 0.00e+00 | 3.56e-04 | 0.00e+00 | 9.93e-04 | 0.00e+00 | 8.10e-05 |
| U-236 | 4.67e-03 | 0.00e+00 | 3.64e-04 | 0.00e+00 | 1.01e-03 | 0.00e+00 | 5.98e-05 |
| U-237 | 4.95e-07 | 0.00e+00 | 1.32e-07 | 0.00e+00 | 1.23e-06 | 0.00e+00 | 2.11e-05 |
| U-238 | 4.47e-03 | 0.00e+00 | 3.33e-04 | 0.00e+00 | 9.28e-04 | 0.00e+00 | 5.71e-05 |
| Np-237 | 2.40e-03 | 1.59e-04 | 1.05e-04 | 0.00e+00 | 6.34e-04 | 0.00e+00 | 8.23e-05 |

Conversion factors are in units of mrem per pCi ingested.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Ingestion Dose Conversion factors for Infant age group by nuclide.
Waterford Steam Electric Station

| Nuclide | Organ Dose Conversion Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Bone | Liver | T. Body | Thyroid | Kidney | Lung | GI-LLI |
| Np-238 | 1.24e-07 | 3.12e-09 | 1.92e-09 | 0.00e+00 | 6.81e-09 | 0.00e+00 | 4.17e-05 |
| Np-239 | 1.11e-08 | 9.93e-10 | 5.61e-10 | 0.00e+00 | 1.98e-09 | 0.00e+00 | 2.87e-05 |
| Pu-238 | 1.28e-03 | 1.50e-04 | 3.40e-05 | 0.00e+00 | 1.21e-04 | 0.00e+00 | 7.57e-05 |
| Pu-239 | 1.38e-03 | 1.55e-04 | 3.54e-05 | 0.00e+00 | 1.28e-04 | 0.00e+00 | 6.91e-05 |
| Pu-240 | 1.38e-03 | 1.55e-04 | 3.54e-05 | 0.00e+00 | 1.28e-04 | 0.00e+00 | 7.04e-05 |
| Pu-241 | 4.25e-05 | 1.76e-06 | 8.82e-07 | 0.00e+00 | 3.17e-06 | 0.00e+00 | 1.45e-06 |
| Pu-242 | 1.28e-03 | 1.49e-04 | 3.41e-05 | 0.00e+00 | 1.23e-04 | 0.00e+00 | 6.77e-05 |
| Pu-244 | 1.49e-03 | 1.71e-04 | 3.91e-05 | 0.00e+00 | 1.41e-04 | 0.00e+00 | 1.01e-04 |
| Am-241 | 1.46e-03 | 1.27e-03 | 1.09e-04 | 0.00e+00 | 6.55e-04 | 0.00e+00 | 7.70e-05 |
| Am-242m | 1.51e-03 | 1.22e-03 | 1.13e-04 | 0.00e+00 | 6.64e-04 | 0.00e+00 | 9.69e-05 |
| Am-243 | 1.44e-03 | 1.23e-03 | 1.06e-04 | 0.00e+00 | 6.36e-04 | 0.00e+00 | 9.03e-05 |
| Cm-242 | 1.37e-04 | 1.27e-04 | 9.10e-06 | 0.00e+00 | 2.62e-05 | 0.00e+00 | 8.23e-05 |
| Cm-243 | 1.40e-03 | 1.15e-03 | 8.98e-05 | 0.00e+00 | 3.27e-04 | 0.00e+00 | 8.10e-05 |
| Cm-244 | 1.18e-03 | 9.70e-04 | 7.59e-05 | 0.00e+00 | 2.71e-04 | 0.00e+00 | 7.84e-05 |
| Cm-245 | 1.79e-03 | 1.45e-03 | 1.13e-04 | 0.00e+00 | 4.32e-04 | 0.00e+00 | 7.30e-05 |
| Cm-246 | 1.77e-03 | 1.45e-03 | 1.13e-04 | 0.00e+00 | 4.31e-04 | 0.00e+00 | 7.17e-05 |
| Cm-247 | 1.73e-03 | 1.43e-03 | 1.11e-04 | 0.00e+00 | 4.24e-04 | 0.00e+00 | 9.43e-05 |
| Cm-248 | 1.43e-02 | 1.18e-02 | 9.16e-04 | 0.00e+00 | 3.50e-03 | 0.00e+00 | 1.52e-03 |
| Cf-252 | 1.22e-03 | 0.00e+00 | 2.95e-05 | 0.00e+00 | 0.00e+00 | 0.00e+00 | 2.99e-04 |

Conversion factors are in units of mrem per pCi ingested.

SPECIFIC FACTORS USED TO DETERMINE $A_i$, $P_i$, $R_i$, VALUES FOR THE OFFSITE DOSE CALCULATION MANUAL

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Values for $A_i$, $P_i$, and $R_i$ were calculated as per NUREG-0133. Recommended values for various factors in the calculations were as specified in NUREG-0133. The location of most of the recommended factors are contained in USNRC Regulartory Guide 1.109, NUREG 0172, and NUREG/CR 1276. All factors used in Waterford-3 SES's calculations are for the maximum individual and are not site specific. The various factors are discussed below.

- Stable element transfer coefficients for vegetation, cow's milk, goat's milk and meat (Attachment 7.22, pages 10 - 12) were obtained from NUREG/CR 1276.
- Animal consumption rates (Attachment 7.22, page 2) were obtained from USNRC Regulatory Guide 1.109.
- Usage or consumption rates for adult, teen, child, and infant age groups (Attachment 7.22, page 3) were obtained from USNRC Regulartory Guide 1.109. These values are for the maximum exposed individual.
- External dose factors for standing on contaminated ground (Attachment 7.20) were obtained from NUREG/CR 1276.
- Bioaccumulation factors for freshwater and saltwater vertebrates and invertebrates (Attachment 7.22, page 13 - 15) were obtained from NUREG/CR 1276.
- Inhalation and ingestion dose factors for adult, teen, child, and infant age groups (Attachment 7.21) were obtained from NUREG/CR 1276.
- Radionuclide half-lives and decay constants are included Attachment 7.22, pages 4 - 9.
- Other factors (Attachment 7.22, page 16 - 18) used were obtained from USNRC Regulartory Guide 1.109 for various parameters,.

Animal Consumption rates.
Waterford Steam Electric Station

| | | |
|---|---|---|
| Milk cow's feed intake rate | : | 50.00 kg/day |
| Milk cow's water intake rate | : | 60.00 l/day |
| Beef cow's feed intake rate | : | 50.00 kg/day |
| Beef cow's water intake rate | : | 50.00 l/day |
| Goat's feed intake rate | : | 6.00 kg/day |
| Goat's water intake rate | : | 8.00 l/day |

Consumption rates for MAXIMAL individuals.
Waterford Steam Electric Station

| | | | |
|---|---|---|---|
| produce veg | usage rate for the Adult : | 520.0 | kg/yr |
| produce veg | usage rate for the Teen : | 630.0 | kg/yr |
| produce veg | usage rate for the Child : | 520.0 | kg/yr |
| produce veg | usage rate for the Infant : | 0.0 | kg/yr |
| leafy veg | usage rate for the Adult : | 64.0 | kg/yr |
| leafy veg | usage rate for the Teen : | 42.0 | kg/yr |
| leafy veg | usage rate for the Child : | 26.0 | kg/yr |
| leafy veg | usage rate for the Infant : | 0.0 | kg/yr |
| milk | usage rate for the Adult : | 310.0 | l/yr |
| milk | usage rate for the Teen : | 400.0 | l/yr |
| milk | usage rate for the Child : | 330.0 | l/yr |
| milk | usage rate for the Infant : | 330.0 | l/yr |
| meat/poultry | usage rate for the Adult : | 110.0 | kg/yr |
| meat/poultry | usage rate for the Teen : | 65.0 | kg/yr |
| meat/poultry | usage rate for the Child : | 41.0 | kg/yr |
| meat/poultry | usage rate for the Infant : | 0.0 | kg/yr |
| fish | usage rate for the Adult : | 21.0 | kg/yr |
| fish | usage rate for the Teen : | 16.0 | kg/yr |
| fish | usage rate for the Child : | 6.9 | kg/yr |
| fish | usage rate for the Infant : | 0.0 | kg/yr |
| seafood | usage rate for the Adult : | 5.0 | kg/yr |
| seafood | usage rate for the Teen : | 3.8 | kg/yr |
| seafood | usage rate for the Child : | 1.7 | kg/yr |
| seafood | usage rate for the Infant : | 0.0 | kg/yr |
| drink h2o | usage rate for the Adult : | 730.0 | l/yr |
| drink h2o | usage rate for the Teen : | 510.0 | l/yr |
| drink h2o | usage rate for the Child : | 510.0 | l/yr |
| drink h2o | usage rate for the Infant : | 330.0 | l/yr |
| shore rec | usage rate for the Adult : | 12.0 | hr/yr |
| shore rec | usage rate for the Teen : | 67.0 | hr/yr |
| shore rec | usage rate for the Child : | 14.0 | hr/yr |
| shore rec | usage rate for the Infant : | 0.0 | hr/yr |
| inhalation | usage rate for the Adult : | 8000.0 | m3/yr |
| inhalation | usage rate for the Teen : | 8000.0 | m3/yr |
| inhalation | usage rate for the Child : | 3700.0 | m3/yr |
| inhalation | usage rate for the Infant : | 1400.0 | m3/yr |

Radionuclide Parameters used.
Waterford Steam Electric Station

| Nuclide | Parameters | |
|---|---|---|
| | Half-life | Decay constant |
| H-3 | 1.2280e+01 years | 1.7899e-09 1/seconds |
| Be-10 | 1.6000e+06 years | 1.3737e-14 1/seconds |
| C-14 | 5.7300e+03 years | 3.8359e-12 1/seconds |
| N-13 | 9.9700e+00 minutes | 1.1587e-03 1/seconds |
| F-18 | 1.8300e+00 hours | 1.0521e-04 1/seconds |
| Na-22 | 2.6000e+00 years | 8.4537e-09 1/seconds |
| Na-24 | 1.5000e+01 hours | 1.2836e-05 1/seconds |
| P-32 | 1.4290e+01 days | 5.6141e-07 1/seconds |
| Ca-41 | 1.3000e+05 years | 1.6907e-13 1/seconds |
| Sc-46 | 8.3800e+01 days | 9.5734e-08 1/seconds |
| Cr-51 | 2.7704e+01 days | 2.8958e-07 1/seconds |
| Mn-54 | 3.1270e+02 days | 2.5656e-08 1/seconds |
| Mn-56 | 2.5758e+00 hours | 7.4750e-05 1/seconds |
| Fe-55 | 2.7000e+00 years | 8.1406e-09 1/seconds |
| Fe-59 | 4.4630e+01 days | 1.7976e-07 1/seconds |
| Co-57 | 2.7000e+02 days | 2.9713e-08 1/seconds |
| Co-58 | 7.0800e+01 days | 1.1331e-07 1/seconds |
| Co-60 | 5.2710e+00 years | 4.1699e-09 1/seconds |
| Ni-59 | 7.5000e+04 years | 2.9306e-13 1/seconds |
| Ni-63 | 1.0010e+02 years | 2.1958e-10 1/seconds |
| Ni-65 | 2.5200e+00 hours | 7.6405e-05 1/seconds |
| Cu-64 | 1.2701e+01 hours | 1.5160e-05 1/seconds |
| Zn-65 | 2.4440e+02 days | 3.2825e-08 1/seconds |
| Zn-69 | 5.5600e+01 minutes | 2.0778e-04 1/seconds |
| Zn-69m | 1.3800e+01 hours | 1.3952e-05 1/seconds |
| Se-79 | 6.5000e+04 years | 3.3815e-13 1/seconds |
| Br-82 | 1.4700e+00 days | 5.4575e-06 1/seconds |
| Br-83 | 2.3900e+00 hours | 8.0561e-05 1/seconds |
| Br-84 | 3.1800e+01 minutes | 3.6328e-04 1/seconds |
| Br-85 | 1.7200e+02 seconds | 4.0299e-03 1/seconds |

Radionuclide Parameters used.
Waterford Steam Electric Station

| Nuclide | Parameters | |
|---|---|---|
| | Half-life | Decay constant |
| Rb-86 | 1.8660e+01 days | 4.2993e-07 1/seconds |
| Rb-87 | 4.6000e+10 years | 4.7782e-19 1/seconds |
| Rb-88 | 1.7800e+01 minutes | 6.4901e-04 1/seconds |
| Rb-89 | 1.5440e+01 minutes | 7.4822e-04 1/seconds |
| Sr-89 | 5.0550e+01 days | 1.5870e-07 1/seconds |
| Sr-90 | 2.8600e+01 years | 7.6852e-10 1/seconds |
| Sr-91 | 9.5000e+00 hours | 2.0267e-05 1/seconds |
| Sr-92 | 2.7100e+00 hours | 7.1048e-05 1/seconds |
| Y-90 | 6.4100e+01 hours | 3.0038e-06 1/seconds |
| Y-91 | 5.8510e+01 days | 1.3711e-07 1/seconds |
| Y-91m | 4.9710e+01 minutes | 2.3240e-04 1/seconds |
| Y-92 | 3.5400e+00 hours | 5.4390e-05 1/seconds |
| Y-93 | 1.0100e+01 hours | 1.9063e-05 1/seconds |
| Zr-93 | 1.5000e+06 years | 1.4653e-14 1/seconds |
| Zr-95 | 6.4020e+01 days | 1.2531e-07 1/seconds |
| Zr-97 | 1.6900e+01 hours | 1.1393e-05 1/seconds |
| Nb-93m | 1.3600e+01 years | 1.6161e-09 1/seconds |
| Nb-95 | 3.5060e+01 days | 2.2882e-07 1/seconds |
| Nb-97 | 1.2300e+00 hours | 1.5654e-04 1/seconds |
| Mo-93 | 3.5000e+03 years | 6.2799e-12 1/seconds |
| Mo-99 | 6.6020e+01 hours | 2.9164e-06 1/seconds |
| Tc-101 | 1.4200e+01 minutes | 8.1355e-04 1/seconds |
| Tc-99 | 2.1400e+05 years | 1.0271e-13 1/seconds |
| Tc-99m | 6.0200e+00 hours | 3.1984e-05 1/seconds |
| Ru-103 | 3.9350e+01 days | 2.0388e-07 1/seconds |
| Ru-105 | 4.4400e+00 hours | 4.3365e-05 1/seconds |
| Ru-106 | 3.6820e+02 days | 2.1789e-08 1/seconds |
| Rh-105 | 1.4700e+00 days | 5.4575e-06 1/seconds |
| Pd-107 | 6.5000e+06 years | 3.3815e-15 1/seconds |
| Pd-109 | 1.3500e+01 hours | 1.4262e-05 1/seconds |

Radionuclide Parameters used.
Waterford Steam Electric Station

| Nuclide | Parameters | |
|---|---|---|
| | Half-life | Decay constant |
| Ag-110m | 2.4985e+02 days | 3.2109e-08 1/seconds |
| Ag-111 | 7.4500e+00 days | 1.0769e-06 1/seconds |
| Cd-113m | 1.4600e+01 years | 1.5054e-09 1/seconds |
| Cd-115m | 4.4600e+01 days | 1.7988e-07 1/seconds |
| Sn-123 | 1.2900e+02 days | 6.2190e-08 1/seconds |
| Sn-125 | 9.6200e+00 days | 8.3394e-07 1/seconds |
| Sn-126 | 1.0000e+05 years | 2.1980e-13 1/seconds |
| Sb-124 | 6.0200e+01 days | 1.3326e-07 1/seconds |
| Sb-125 | 2.7700e+00 years | 7.9349e-09 1/seconds |
| Sb-126 | 1.2500e+01 days | 6.4180e-07 1/seconds |
| Sb-127 | 9.3000e+01 hours | 2.0703e-06 1/seconds |
| Te-125m | 5.8000e+01 days | 1.3832e-07 1/seconds |
| Te-127 | 9.3500e+00 hours | 2.0593e-05 1/seconds |
| Te-127m | 1.0900e+02 days | 7.3601e-08 1/seconds |
| Te-129 | 6.9600e+01 minutes | 1.6598e-04 1/seconds |
| Te-129m | 3.3600e+01 days | 2.3877e-07 1/seconds |
| Te-131 | 2.5000e+01 minutes | 4.6210e-04 1/seconds |
| Te-131m | 3.0000e+01 hours | 6.4180e-06 1/seconds |
| Te-132 | 7.8200e+01 hours | 2.4622e-06 1/seconds |
| Te-133m | 5.5400e+01 minutes | 2.0853e-04 1/seconds |
| Te-134 | 4.1800e+01 minutes | 2.7637e-04 1/seconds |
| I-129 | 1.5700e+07 years | 1.4000e-15 1/seconds |
| I-130 | 1.2360e+01 hours | 1.5578e-05 1/seconds |
| I-131 | 8.0400e+00 days | 9.9783e-07 1/seconds |
| I-132 | 2.3000e+00 hours | 8.3713e-05 1/seconds |
| I-133 | 2.0800e+01 hours | 9.2568e-06 1/seconds |
| I-134 | 5.2600e+01 minutes | 2.1963e-04 1/seconds |
| I-135 | 6.6100e+00 hours | 2.9129e-05 1/seconds |
| Cs-134 | 2.0620e+00 years | 1.0659e-08 1/seconds |
| Cs-134m | 2.9000e+00 hours | 6.6393e-05 1/seconds |

Radionuclide Parameters used.
Waterford Steam Electric Station

| Nuclide | Parameters | |
|---|---|---|
| | Half-life | Decay constant |
| Cs-135 | 2.0000e+06 years | 1.0990e-14 1/seconds |
| Cs-136 | 1.3160e+01 days | 6.0962e-07 1/seconds |
| Cs-137 | 3.0170e+01 years | 7.2852e-10 1/seconds |
| Cs-138 | 3.2200e+01 minutes | 3.5877e-04 1/seconds |
| Cs-139 | 9.4000e+00 minutes | 1.2290e-03 1/seconds |
| Ba-139 | 8.3100e+01 minutes | 1.3902e-04 1/seconds |
| Ba-140 | 1.2789e+01 days | 6.2730e-07 1/seconds |
| Ba-141 | 1.8270e+01 minutes | 6.3232e-04 1/seconds |
| Ba-142 | 1.0700e+01 minutes | 1.0797e-03 1/seconds |
| La-140 | 4.0220e+01 hours | 4.7872e-06 1/seconds |
| La-141 | 3.9300e+00 hours | 4.8993e-05 1/seconds |
| La-142 | 9.5400e+01 minutes | 1.2109e-04 1/seconds |
| Ce-141 | 3.2500e+01 days | 2.4685e-07 1/seconds |
| Ce-143 | 3.3000e+01 hours | 5.8346e-06 1/seconds |
| Ce-144 | 2.8430e+02 days | 2.8219e-08 1/seconds |
| Pr-143 | 1.3560e+01 days | 5.9163e-07 1/seconds |
| Pr-144 | 1.7280e+01 minutes | 6.6854e-04 1/seconds |
| Nd-147 | 1.0980e+01 days | 7.3065e-07 1/seconds |
| Pm-147 | 2.6200e+00 years | 8.3891e-09 1/seconds |
| Pm-148 | 5.3700e+00 days | 1.4940e-06 1/seconds |
| Pm-148m | 4.1300e+01 days | 1.9425e-07 1/seconds |
| Pm-149 | 2.2100e+00 days | 3.6301e-06 1/seconds |
| Pm-151 | 1.1800e+00 days | 6.7988e-06 1/seconds |
| Sm-151 | 9.3000e+01 years | 2.3634e-10 1/seconds |
| Sm-153 | 1.9500e+00 days | 4.1141e-06 1/seconds |
| Eu-152 | 1.2700e+01 years | 1.7307e-09 1/seconds |
| Eu-154 | 1.6000e+02 years | 1.3737e-10 1/seconds |
| Eu-155 | 1.8000e+00 years | 1.2211e-08 1/seconds |
| Eu-156 | 1.5200e+01 days | 5.2780e-07 1/seconds |
| Tb-160 | 7.2100e+01 days | 1.1127e-07 1/seconds |

Radionuclide Parameters used.
Waterford Steam Electric Station

| Nuclide | Parameters | |
|---|---|---|
| | Half-life | Decay constant |
| Ho-166m | 1.2000e+03 years | 1.8316e-11 1/seconds |
| W-181 | 1.2100e+02 days | 6.6302e-08 1/seconds |
| W-185 | 7.5100e+01 days | 1.0682e-07 1/seconds |
| W-187 | 2.3830e+01 hours | 8.0798e-06 1/seconds |
| Pb-210 | 2.0400e+01 years | 1.0774e-09 1/seconds |
| Bi-210 | 5.0100e+00 days | 1.6013e-06 1/seconds |
| Po-210 | 1.3800e+02 days | 5.8134e-08 1/seconds |
| Ra-223 | 1.1400e+01 days | 7.0373e-07 1/seconds |
| Ra-224 | 3.6600e+00 days | 2.1919e-06 1/seconds |
| Ra-225 | 1.4800e+01 days | 5.4206e-07 1/seconds |
| Ra-226 | 1.6000e+03 years | 1.3737e-11 1/seconds |
| Ra-228 | 5.7500e+00 years | 3.8225e-09 1/seconds |
| Ac-225 | 1.0000e+01 days | 8.0225e-07 1/seconds |
| Ac-227 | 2.1800e+01 years | 1.0082e-09 1/seconds |
| Th-227 | 1.8500e+01 days | 4.3365e-07 1/seconds |
| Th-228 | 1.9100e+00 years | 1.1508e-08 1/seconds |
| Th-229 | 7.3400e+03 years | 2.9945e-12 1/seconds |
| Th-230 | 7.7000e+04 years | 2.8545e-13 1/seconds |
| Th-232 | 1.4100e+10 years | 1.5588e-18 1/seconds |
| Th-234 | 2.4100e+01 days | 3.3289e-07 1/seconds |
| Pa-231 | 3.2800e+04 years | 6.7011e-13 1/seconds |
| Pa-233 | 2.7400e+01 days | 2.9279e-07 1/seconds |
| U-232 | 7.2000e+01 years | 3.0527e-10 1/seconds |
| U-233 | 1.5800e+05 years | 1.3911e-13 1/seconds |
| U-234 | 2.4800e+05 years | 8.8627e-14 1/seconds |
| U-235 | 7.0400e+08 years | 3.1221e-17 1/seconds |
| U-236 | 3.3400e+07 years | 6.5807e-16 1/seconds |
| U-237 | 6.7500e+00 days | 1.1885e-06 1/seconds |
| U-238 | 4.7000e+09 years | 4.6765e-18 1/seconds |
| Np-237 | 2.1400e+06 years | 1.0271e-14 1/seconds |

Radionuclide Parameters used.
Waterford Steam Electric Station

| Nuclide | Parameters | |
|---|---|---|
| | Half-life | Decay constant |
| Np-238 | 2.1200e+00 days | 3.7842e-06 1/seconds |
| Np-239 | 2.3550e+00 days | 3.4066e-06 1/seconds |
| Pu-238 | 8.7800e+01 years | 2.5034e-10 1/seconds |
| Pu-239 | 2.4100e+04 years | 9.1201e-13 1/seconds |
| Pu-240 | 6.5400e+03 years | 3.3608e-12 1/seconds |
| Pu-241 | 1.5200e+01 years | 1.4460e-09 1/seconds |
| Pu-242 | 3.8700e+05 years | 5.6795e-14 1/seconds |
| Pu-244 | 8.2600e+07 years | 2.6610e-16 1/seconds |
| Am-241 | 4.3300e+00 years | 5.0761e-09 1/seconds |
| Am-242m | 1.5200e+02 years | 1.4460e-10 1/seconds |
| Am-243 | 7.3800e+03 years | 2.9783e-12 1/seconds |
| Cm-242 | 1.6300e+02 days | 4.9218e-08 1/seconds |
| Cm-243 | 2.8500e+01 years | 7.7121e-10 1/seconds |
| Cm-244 | 1.8100e+01 years | 1.2143e-09 1/seconds |
| Cm-245 | 8.5000e+03 years | 2.5858e-12 1/seconds |
| Cm-246 | 4.8200e+03 years | 4.5601e-12 1/seconds |
| Cm-247 | 1.5600e+07 years | 1.4089e-15 1/seconds |
| Cm-248 | 3.6100e+05 years | 6.0885e-14 1/seconds |
| Cf-252 | 2.4600e+00 years | 8.9348e-09 1/seconds |

Stable Element Transfer Coefficients by nuclide.
Waterford Steam Electric Station

| Element | Stable Element Transfer Data | | | |
|---|---|---|---|---|
| | Biv Veg/Soil | Fm Cow Milk | Ff Meat | Fm Goat Milk |
| H | 4.80e+00 | 1.00e-02 | 1.20e-02 | 1.70e-01 |
| He | 5.00e-02 | 2.00e-02 | 2.00e-02 | 2.00e-02 |
| Li | 8.30e-04 | 5.00e-02 | 1.00e-02 | 5.00e-02 |
| Be | 4.20e-04 | 1.00e-04 | 1.00e-03 | 1.00e-04 |
| B | 1.20e-01 | 2.70e-03 | 8.00e-04 | 2.70e-03 |
| C | 5.50e+00 | 1.20e-02 | 3.10e-02 | 1.00e-01 |
| N | 7.50e+00 | 2.20e-02 | 7.70e-02 | 2.20e-02 |
| O | 1.60e+00 | 2.00e-02 | 1.60e-02 | 2.00e-02 |
| F | 6.50e-04 | 1.40e-02 | 1.50e-01 | 1.40e-02 |
| Ne | 1.40e-01 | 2.00e-02 | 2.00e-02 | 2.00e-02 |
| Na | 5.20e-02 | 4.00e-02 | 3.00e-02 | 4.00e-02 |
| Mg | 1.30e-01 | 1.00e-02 | 5.00e-03 | 1.00e-02 |
| Al | 1.80e-04 | 5.00e-04 | 1.50e-03 | 5.00e-04 |
| Si | 1.50e-04 | 1.00e-04 | 4.00e-05 | 1.00e-04 |
| P | 1.10e+00 | 2.50e-02 | 4.60e-02 | 2.50e-01 |
| S | 5.90e-01 | 1.80e-02 | 1.00e-01 | 1.80e-02 |
| Cl | 5.00e+00 | 5.00e-02 | 8.00e-02 | 5.00e-02 |
| Ar | 6.00e-01 | 2.00e-02 | 2.00e-02 | 2.00e-02 |
| K | 3.70e-01 | 1.00e-02 | 1.20e-02 | 1.00e-02 |
| Ca | 3.60e-02 | 8.00e-03 | 4.00e-03 | 8.00e-03 |
| Sc | 1.10e-03 | 5.00e-06 | 1.60e-02 | 5.00e-06 |
| Ti | 5.40e-05 | 5.00e-06 | 3.10e-02 | 5.00e-06 |
| V | 1.30e-03 | 1.00e-03 | 2.30e-03 | 1.00e-03 |
| Cr | 2.50e-04 | 2.20e-03 | 2.40e-03 | 2.20e-03 |
| Mn | 2.90e-02 | 2.50e-04 | 8.00e-04 | 2.50e-04 |
| Fe | 6.60e-04 | 1.20e-03 | 4.00e-02 | 1.30e-04 |
| Co | 9.40e-03 | 1.00e-03 | 1.30e-02 | 1.00e-03 |
| Ni | 1.90e-02 | 6.70e-03 | 5.30e-03 | 6.70e-03 |
| Cu | 1.20e-01 | 1.40e-02 | 8.00e-03 | 1.30e-02 |
| Zn | 4.00e-01 | 3.90e-02 | 3.00e-02 | 3.90e-02 |
| Ga | 2.50e-04 | 5.00e-05 | 1.30e+00 | 5.00e-05 |
| Ge | 1.00e-01 | 5.00e-04 | 2.00e+01 | 5.00e-04 |
| As | 1.00e-02 | 6.00e-03 | 2.00e-03 | 6.00e-03 |
| Se | 1.30e+00 | 4.50e-02 | 1.50e-02 | 4.50e-02 |
| Br | 7.60e-01 | 5.00e-02 | 2.60e-02 | 5.00e-02 |

Units for transfer data are derived as follows:
Biv -> pCi/kg in vegetation per pCi/kg in soil (no units),
Fm -> pCi/liter in milk per pCi/day ingested by animal (days/liter),
Ff -> pCi/kg in meat per pCi/day ingested by animal (days/kg).

Stable Element Transfer Coefficients by nuclide.
Waterford Steam Electric Station

| Element | Stable Element Transfer Data | | | |
|---|---|---|---|---|
| | Biv Veg/Soil | Fm Cow Milk | Ff Meat | Fm Goat Milk |
| Kr | 3.00e+00 | 2.00e-02 | 2.00e-02 | 2.00e-02 |
| Rb | 1.30e-01 | 3.00e-02 | 3.10e-02 | 3.00e-02 |
| Sr | 1.70e-02 | 8.00e-04 | 6.00e-04 | 1.40e-02 |
| Y | 2.60e-03 | 1.00e-05 | 4.60e-03 | 1.00e-05 |
| Zr | 1.70e-04 | 5.00e-06 | 3.40e-02 | 5.00e-06 |
| Nb | 9.40e-03 | 2.50e-03 | 2.80e-01 | 2.50e-03 |
| Mo | 1.20e-01 | 7.50e-03 | 8.00e-03 | 7.50e-03 |
| Tc | 2.50e-01 | 2.50e-02 | 4.00e-01 | 2.50e-02 |
| Ru | 5.00e-02 | 1.00e-06 | 4.00e-01 | 1.00e-06 |
| Rh | 1.30e+01 | 1.00e-02 | 1.50e-03 | 1.00e-02 |
| Pd | 5.00e+00 | 1.00e-02 | 4.00e-03 | 1.00e-02 |
| Ag | 1.50e-01 | 5.00e-02 | 1.70e-02 | 5.00e-02 |
| Cd | 3.00e-01 | 1.20e-04 | 5.30e-04 | 1.20e-04 |
| In | 2.50e-01 | 1.00e-04 | 8.00e-03 | 1.00e-04 |
| Sn | 2.50e-03 | 2.50e-03 | 8.00e-02 | 2.50e-03 |
| Sb | 1.10e-02 | 1.50e-03 | 4.00e-03 | 1.50e-03 |
| Te | 1.30e+00 | 1.00e-03 | 7.70e-02 | 1.00e-03 |
| I | 2.00e-02 | 6.00e-03 | 2.90e-03 | 6.00e-03 |
| Xe | 1.00e+01 | 2.00e-02 | 2.00e-02 | 2.00e-02 |
| Cs | 1.00e-02 | 1.20e-02 | 4.00e-03 | 3.00e-01 |
| Ba | 5.00e-03 | 4.00e-04 | 3.20e-03 | 4.00e-04 |
| La | 2.50e-03 | 5.00e-06 | 2.00e-04 | 5.00e-06 |
| Ce | 2.50e-03 | 1.00e-04 | 1.20e-03 | 1.00e-04 |
| Pr | 2.50e-03 | 5.00e-06 | 4.70e-03 | 5.00e-06 |
| Nd | 2.40e-03 | 5.00e-06 | 3.30e-03 | 5.00e-06 |
| Pm | 2.50e-03 | 5.00e-06 | 4.80e-03 | 5.00e-06 |
| Sm | 2.50e-03 | 5.00e-06 | 5.00e-03 | 5.00e-06 |
| Eu | 2.50e-03 | 5.00e-06 | 4.80e-03 | 5.00e-06 |
| Gd | 2.60e-03 | 5.00e-06 | 3.60e-03 | 5.00e-06 |
| Tb | 2.60e-03 | 5.00e-06 | 4.40e-03 | 5.00e-06 |
| Dy | 2.50e-03 | 5.00e-06 | 5.30e-03 | 5.00e-06 |
| Ho | 2.60e-03 | 5.00e-06 | 4.40e-03 | 5.00e-06 |
| Er | 2.50e-03 | 5.00e-06 | 4.00e-03 | 5.00e-06 |
| Tm | 2.60e-03 | 5.00e-06 | 4.40e-03 | 5.00e-06 |
| Yb | 2.50e-03 | 5.00e-06 | 4.00e-03 | 5.00e-06 |

Units for transfer data are derived as follows:
Biv -> pCi/kg in vegetation per pCi/kg in soil (no units),
Fm -> pCi/liter in milk per pCi/day ingested by animal (days/liter),
Ff -> pCi/kg in meat per pCi/day ingested by animal (days/kg).

Stable Element Transfer Coefficients by nuclide.
Waterford Steam Electric Station

| Element | Stable Element Transfer Data | | | |
|---|---|---|---|---|
| | Biv Veg/Soil | Fm Cow Milk | Ff Meat | Fm Goat Milk |
| Lu | 2.60e-03 | 5.00e-06 | 4.40e-03 | 5.00e-06 |
| Hf | 1.70e-04 | 5.00e-06 | 4.00e-01 | 5.00e-06 |
| Ta | 6.30e-03 | 2.50e-02 | 1.60e+00 | 2.50e-02 |
| W | 1.80e-02 | 5.00e-04 | 1.39e-03 | 5.00e-04 |
| Re | 2.50e-01 | 2.50e-02 | 8.00e-03 | 2.50e-02 |
| Os | 5.00e-02 | 5.00e-03 | 4.00e-01 | 5.00e-03 |
| Ir | 1.30e+01 | 5.00e-03 | 1.50e-03 | 5.00e-03 |
| Pt | 5.00e-01 | 5.00e-03 | 4.00e-03 | 5.00e-03 |
| Au | 2.50e-03 | 5.00e-03 | 8.00e-03 | 5.00e-03 |
| Hg | 3.80e-01 | 3.80e-02 | 2.60e-01 | 3.80e-02 |
| Tl | 2.50e-01 | 2.20e-02 | 4.00e-02 | 2.20e-02 |
| Pb | 6.80e-02 | 6.20e-04 | 2.90e-04 | 6.20e-04 |
| Bi | 1.50e-01 | 5.00e-04 | 1.30e-02 | 5.00e-04 |
| Po | 1.50e-01 | 3.00e-04 | 1.20e-02 | 3.00e-04 |
| At | 2.50e-01 | 5.00e-02 | 8.00e+00 | 5.00e-02 |
| Rn | 3.50e+00 | 2.00e-02 | 2.00e-02 | 2.00e-02 |
| Fr | 1.00e-02 | 5.00e-02 | 2.00e-02 | 5.00e-02 |
| Ra | 3.10e-04 | 8.00e-03 | 3.40e-02 | 8.00e-03 |
| Ac | 2.50e-03 | 5.00e-06 | 6.00e-02 | 5.00e-06 |
| Th | 4.20e-03 | 5.00e-06 | 2.00e-04 | 5.00e-06 |
| Pa | 2.50e-03 | 5.00e-06 | 8.00e+02 | 5.00e-06 |
| U | 2.50e-03 | 5.00e-04 | 3.40e-04 | 5.00e-04 |
| Np | 2.50e-03 | 5.00e-06 | 2.00e-04 | 5.00e-06 |
| Pu | 2.50e-04 | 2.00e-06 | 1.40e-05 | 2.00e-06 |
| Am | 2.50e-04 | 5.00e-06 | 2.00e-04 | 5.00e-06 |
| Cm | 2.50e-03 | 5.00e-06 | 2.00e-04 | 5.00e-06 |
| Bk | 2.50e-03 | 5.00e-06 | 2.00e-04 | 5.00e-06 |
| Cf | 2.50e-03 | 5.00e-06 | 2.00e-04 | 5.00e-06 |
| Es | 2.50e-03 | 5.00e-06 | 2.00e-04 | 5.00e-06 |
| Fm | 2.50e-03 | 5.00e-06 | 2.00e-04 | 5.00e-06 |

Units for transfer data are derived as follows:
Biv -> pCi/kg in vegetation per pCi/kg in soil (no units),
Fm -> pCi/liter in milk per pCi/day ingested by animal (days/liter),
Ff -> pCi/kg in meat per pCi/day ingested by animal (days/kg).

Bioaccumulation Factors for Aquatic Organisms by element.
Waterford Steam Electric Station

| Element | Bioaccumulation Factors | | | |
|---|---|---|---|---|
| | Fresh Water Fish | Fresh Water Invert. | Salt Water Fish | Salt Water Invert. |
| H | 9.00e-01 | 9.00e-01 | 9.00e-01 | 9.30e-01 |
| He | 1.00e+00 | 1.00e+00 | 1.00e+00 | 1.00e+00 |
| Li | 5.00e-01 | 4.00e+01 | 5.00e-01 | 5.00e-01 |
| Be | 2.00e+00 | 1.00e+01 | 2.00e+02 | 2.00e+02 |
| B | 2.20e-01 | 5.00e+01 | 2.20e-01 | 4.40e-01 |
| C | 4.60e+03 | 9.10e+03 | 1.80e+03 | 1.40e+03 |
| N | 1.50e+05 | 1.50e+05 | 6.00e+04 | 1.70e+04 |
| O | 9.20e-01 | 9.20e-01 | 9.60e-01 | 9.60e-01 |
| F | 1.00e+01 | 1.00e+02 | 3.60e+00 | 3.60e+00 |
| Ne | 1.00e+00 | 1.00e+00 | 1.00e+00 | 1.00e+00 |
| Na | 1.00e+02 | 2.00e+02 | 6.70e-02 | 1.90e-01 |
| Mg | 5.00e+01 | 1.00e+02 | 7.70e-01 | 7.70e-01 |
| Al | 1.00e+01 | 6.30e+01 | 1.00e+01 | 6.00e+01 |
| Si | 2.50e+00 | 2.50e+01 | 1.00e+01 | 3.30e+01 |
| P | 1.00e+05 | 2.00e+04 | 2.90e+04 | 3.00e+04 |
| S | 7.50e+02 | 1.00e+02 | 1.70e+00 | 4.40e-01 |
| Cl | 5.00e+01 | 1.00e+02 | 1.30e-02 | 1.90e-02 |
| Ar | 1.00e+00 | 1.00e+00 | 1.00e+00 | 1.00e+00 |
| K | 1.00e+03 | 8.30e+02 | 1.10e+01 | 6.60e+00 |
| Ca | 4.00e+01 | 3.30e+02 | 5.00e-01 | 1.30e+01 |
| Sc | 2.00e+00 | 1.00e+03 | 2.00e+00 | 1.00e+04 |
| Ti | 1.00e+03 | 3.00e+03 | 1.00e+03 | 1.00e+03 |
| V | 1.00e+01 | 3.00e+03 | 1.00e+01 | 5.00e+01 |
| Cr | 2.00e+02 | 2.00e+03 | 4.00e+02 | 2.00e+03 |
| Mn | 4.00e+02 | 9.00e+04 | 5.50e+02 | 4.00e+02 |
| Fe | 1.00e+02 | 3.20e+03 | 3.00e+03 | 2.00e+04 |
| Co | 5.00e+01 | 2.00e+02 | 1.00e+02 | 1.00e+03 |
| Ni | 1.00e+02 | 1.00e+02 | 1.00e+02 | 2.50e+02 |
| Cu | 5.00e+01 | 4.00e+02 | 6.70e+02 | 1.70e+03 |
| Zn | 2.00e+03 | 1.00e+04 | 2.00e+03 | 5.00e+04 |
| Ga | 3.30e+02 | 6.70e+02 | 3.30e+02 | 6.70e+02 |
| Ge | 3.30e+03 | 3.30e+01 | 3.30e+03 | 1.70e+04 |
| As | 1.00e+02 | 4.00e+01 | 3.30e+02 | 3.30e+02 |
| Se | 1.70e+02 | 1.70e+02 | 4.00e+03 | 1.00e+03 |
| Br | 4.20e+02 | 3.30e+02 | 1.50e-02 | 3.10e+00 |
| Kr | 1.00e+00 | 1.00e+00 | 1.00e+00 | 1.00e+00 |
| Rb | 2.00e+03 | 1.00e+03 | 8.30e+00 | 1.70e+01 |

Bioaccmulation factors in units of pCi/kg per pCi/liter.

Bioaccumulation Factors for Aquatic Organisms by element.
Waterford Steam Electric Station

| Element | Bioaccumulation Factors | | | |
|---|---|---|---|---|
| | Fresh Water Fish | Fresh Water Invert. | Salt Water Fish | Salt Water Invert. |
| Sr | 3.00e+01 | 1.00e+02 | 2.00e+00 | 2.00e+01 |
| Y | 2.50e+01 | 1.00e+03 | 2.50e+01 | 1.00e+03 |
| Zr | 3.30e+00 | 6.70e+00 | 2.00e+02 | 8.00e+01 |
| Nb | 3.00e+02 | 1.00e+02 | 3.00e+04 | 1.00e+02 |
| Mo | 1.00e+01 | 1.00e+01 | 1.00e+01 | 1.00e+01 |
| Tc | 1.50e+01 | 5.00e+00 | 1.00e+01 | 5.00e+01 |
| Ru | 1.00e+01 | 3.00e+02 | 3.00e+00 | 1.00e+03 |
| Rh | 1.00e+01 | 3.00e+02 | 1.00e+01 | 2.00e+03 |
| Pd | 1.00e+01 | 3.00e+02 | 1.00e+01 | 2.00e+03 |
| Ag | 2.30e+00 | 7.70e+02 | 3.30e+03 | 3.30e+03 |
| Cd | 2.00e+02 | 2.00e+03 | 3.00e+03 | 2.50e+05 |
| In | 1.00e+05 | 1.00e+05 | 1.00e+05 | 1.00e+05 |
| Sn | 3.00e+03 | 1.00e+03 | 3.00e+03 | 1.00e+03 |
| Sb | 1.00e+00 | 1.00e+01 | 4.00e+01 | 5.00e+00 |
| Te | 4.00e+02 | 6.10e+03 | 1.00e+01 | 1.00e+02 |
| I | 1.50e+01 | 5.00e+00 | 1.00e+01 | 5.00e+01 |
| Xe | 1.00e+00 | 1.00e+00 | 1.00e+00 | 1.00e+00 |
| Cs | 2.00e+03 | 1.00e+03 | 4.00e+01 | 2.50e+01 |
| Ba | 4.00e+00 | 2.00e+02 | 1.00e+01 | 1.00e+02 |
| La | 2.50e+01 | 1.00e+03 | 2.50e+01 | 1.00e+03 |
| Ce | 1.00e+00 | 1.00e+03 | 1.00e+01 | 6.00e+02 |
| Pr | 2.50e+01 | 1.00e+03 | 2.50e+01 | 1.00e+03 |
| Nd | 2.50e+01 | 1.00e+03 | 2.50e+01 | 1.00e+03 |
| Pm | 2.50e+01 | 1.00e+03 | 2.50e+01 | 1.00e+03 |
| Sm | 2.50e+01 | 1.00e+03 | 2.50e+01 | 1.00e+03 |
| Eu | 2.50e+01 | 1.00e+03 | 2.50e+01 | 1.00e+03 |
| Gd | 2.50e+01 | 1.00e+03 | 2.50e+01 | 1.00e+03 |
| Tb | 2.50e+01 | 1.00e+03 | 2.50e+01 | 1.00e+03 |
| Dy | 2.50e+01 | 1.00e+03 | 2.50e+01 | 1.00e+03 |
| Ho | 2.50e+01 | 1.00e+03 | 2.50e+01 | 1.00e+03 |
| Er | 2.50e+01 | 1.00e+03 | 2.50e+01 | 1.00e+03 |
| Tm | 2.50e+01 | 1.00e+03 | 2.50e+01 | 1.00e+03 |
| Yb | 2.50e+01 | 1.00e+03 | 2.50e+01 | 1.00e+03 |
| Lu | 2.50e+01 | 1.00e+03 | 2.50e+01 | 1.00e+03 |
| Hf | 3.30e+00 | 6.70e+00 | 2.00e+02 | 2.00e+01 |
| Ta | 3.00e+04 | 6.70e+02 | 3.00e+04 | 1.70e+04 |
| W | 1.20e+03 | 1.00e+01 | 3.00e+01 | 3.00e+01 |

Bioaccmulation factors in units of pCi/kg per pCi/liter.

Bioaccumulation Factors for Aquatic Organisms by element.
Waterford Steam Electric Station

| Element | Bioaccumulation Factors | | | |
|---|---|---|---|---|
| | Fresh Water Fish | Fresh Water Invert. | Salt Water Fish | Salt Water Invert. |
| Re | 1.20e+02 | 6.00e+01 | 4.80e+00 | 6.00e+01 |
| Os | 1.00e+01 | 3.00e+02 | 1.00e+01 | 2.00e+03 |
| Ir | 1.00e+01 | 3.00e+02 | 1.00e+01 | 2.00e+03 |
| Pt | 1.00e+02 | 3.00e+02 | 1.00e+02 | 2.00e+03 |
| Au | 3.30e+01 | 5.00e+01 | 3.30e+01 | 3.30e+01 |
| Hg | 1.00e+03 | 1.00e+05 | 1.70e+03 | 3.30e+04 |
| Tl | 1.00e+04 | 1.50e+04 | 1.00e+04 | 1.50e+04 |
| Pb | 1.00e+02 | 1.00e+02 | 3.00e+02 | 1.00e+03 |
| Bi | 1.50e+01 | 2.40e+01 | 1.50e+01 | 2.40e+01 |
| Po | 5.00e+02 | 2.00e+04 | 3.00e+02 | 5.00e+03 |
| At | 1.50e+01 | 5.00e+00 | 1.00e+01 | 5.00e+01 |
| Rn | 1.00e+00 | 1.00e+00 | 1.00e+00 | 1.00e+00 |
| Fr | 4.00e+02 | 1.00e+02 | 3.00e+01 | 2.00e+01 |
| Ra | 5.00e+01 | 2.50e+02 | 5.00e+01 | 1.00e+02 |
| Ac | 2.50e+01 | 1.00e+03 | 2.50e+01 | 1.00e+03 |
| Th | 3.00e+01 | 5.00e+02 | 1.00e+04 | 2.00e+03 |
| Pa | 1.10e+01 | 1.10e+02 | 1.00e+01 | 1.00e+01 |
| U | 2.00e+00 | 6.00e+01 | 1.00e+01 | 1.00e+01 |
| Np | 1.00e+01 | 4.00e+02 | 1.00e+01 | 1.00e+01 |
| Pu | 3.50e+00 | 1.00e+02 | 3.00e+00 | 2.00e+02 |
| Am | 2.50e+01 | 1.00e+03 | 2.50e+01 | 1.00e+03 |
| Cm | 2.50e+01 | 1.00e+03 | 2.50e+01 | 1.00e+03 |
| Bk | 2.50e+01 | 1.00e+03 | 2.50e+01 | 1.00e+03 |
| Cf | 2.50e+01 | 1.00e+03 | 2.50e+01 | 1.00e+03 |
| Es | 1.00e+01 | 1.00e+02 | 1.00e+01 | 1.00e+01 |
| Fm | 1.00e+01 | 1.00e+02 | 1.00e+01 | 1.00e+01 |

Bioaccmulation factors in units of pCi/kg per pCi/liter.

```
Site Specific Parameters used.

Paramater No.  : 1
Description    : fraction of ingested produce grown in region
Formula Symbol : fg
Value          : 0.760
Units          : none

Paramater No.  : 2
Description    : fraction of leafy vegetables grown in region
Formula Symbol : fL
Value          : 1.000
Units          : none

Paramater No.  : 4
Description    : fraction of activity retained on crops for airborne
                  particulates
Formula Symbol : r
Value          : 0.200
Units          : none

Paramater No.  : 5
Description    : fraction of activity retained on crops for airborne
                  radioiodines
Formula Symbol : r
Value          : 1.000
Units          : none

Paramater No.  : 6
Description    : building shielding factor for maximum individuals
Formula Symbol : SF
Value          : 0.700
Units          : none

Paramater No.  : 11
Description    : period of long term buildup of activity in soil or sediment
Formula Symbol : t
Value          : 131400.000
Units          : hr

Paramater No.  : 12
Description    : transport time from animal feed-milk-man max individuals
Formula Symbol : tf
Value          : 2.000
Units          : days

Paramater No.  : 15
Description    : time delay for harvest of veg/crops and ingestion by
                  animals - stored feed
Formula Symbol : th
Value          : 2160.000
Units          : hr
```

```
Paramater No.  : 16
Description    : time delay for harvest of veg/crops and ingestion by
                  man - leafy veg max indivd
Formula Symbol : tL
Value          : 24.000
Units          : hr

Paramater No.  : 17
Description    : time delay for harvest of veg/crops and ingestion by
                  man - produce veg max ind
Formula Symbol : th
Value          : 1440.000
Units          : hr

Paramater No.  : 37
Description    : agricultural productivity by unit area stored feed
                  feed-animal-man
Formula Symbol : Ys
Value          : 2.000
Units          : kg/m2

Paramater No.  : 38
Description    : agricultural productivity by unit area pasture grass
                  feed-animal-man
Formula Symbol : Yp
Value          : 0.700
Units          : kg/m2

Paramater No.  : 41
Description    : time from slaughter of meat animal to consumption
Formula Symbol : tf
Value          : 20.000
Units          : days

Paramater No.  : 43
Description    : agricultural productivity by unit area crops/veg-man
Formula Symbol : Yv
Value          : 2.000
Units          : kg/m2

Paramater No.  : 44
Description    : rate constant for removal of activity on plants by weathering
Formula Symbol : lambda-w
Value          : 2.062938e-3
Units          : hr-1

Paramater No.  : 69
Description    : fraction of year that milk cows are on pasture
Formula Symbol : fp
Value          : 1.000
Units          : none
```

```
Paramater No.  : 70
Description    : fraction of year that milk goats are on pasture
Formula Symbol : fp
Value          : 1.000
Units          : none

Paramater No.  : 71
Description    : fraction of year that beef cows are on pasture
Formula Symbol : fp
Value          : 1.000
Units          : none

Paramater No.  : 73
Description    : fraction of milk cow's intake from pasture
Formula Symbol : fs
Value          : 1.000
Units          : none

Paramater No.  : 74
Description    : fraction of milk goat's intake from pasture
Formula Symbol : fs
Value          : 1.000
Units          : none

Paramater No.  : 75
Description    : fraction of beef cow's intake from pasture
Formula Symbol : fs
Value          : 1.000
Units          : none

Paramater No.  : 88
Description    : absolute relative humidity in the atmosphere
Formula Symbol : H
Value          : 8.000
Units          : g/m3
```

ODCM SPECIFICATIONS CONTAINED IN THE
WATERFORD III TECHNICAL REQUIREMENTS MANUAL

| TRM SPECIFICATION | TRM TABLE OR SECTION | DESCRIPTION |
|---|---|---|
| 3.11.1.1 | Section 3/4.11.1 | Liquid Effluents - Concentration |
| 4.11.1.1.1 | Table 4.11-1 | Radioactive Liquid Waste Sampling and Analysis Program |
| 3.11.1.2 | Section 3/4.11.1 | Liquid Effluents - Dose |
| 3.11.1.3 | Section 3/4.11.1 | Liquid Radwaste Treatment System |
| 3.11.2.1 | Section 3/4.11.2 | Gaseous Effluents - Dose Rate |
| 4.11.2.1.2 | Table 4.11-2 | Radioactive Gaseous Waste Sampling and Analysis Program |
| 3.11.2.2 | Section 3/4.11.2 | Gaseous Effluents - Dose Rate (Noble Gases) |
| 3.11.2.3 | Section 3/4.11.2 | Gaseous Effluents - Dose Rate (I-131, I-133, Tritium and Particulates) |
| 3.11.2.4 | Section 3/4.11.2 | Gaseous Radwaste Treatment |
| 3.11.4 | Section 3/4.11.4 | Total Dose |
| 3.3.3.10 | Section 3/4.3.3 | Radioactive Liquid Effluent Monitoring Instrumentation |
| 4.3.3.10 | Table 3.3-12 | Radioactive Liquid Effluent Monitoring Instrumentation |
| 3.3.3.11 | Section 3/4.3.3 | Radioactive Gaseous Effluent Monitoring Instrumentation |
| 4.3.3.11 | Table 3.3-12 | Radioactive Gaseous Effluent Monitoring Instrumentation |
| 3.12.1 | Section 3/4.12.1 | Radiological Environmental Monitoring Program |
| 3.12.1 | Table 3.12-1 | Radiological Environmental Monitoring Program |
| 3.12.2 | Table 3.12-2 | Reporting Levels For Radioactivity Concentrations in Environmental Samples |
| 3.12.2 | Table 4.12-1 | Detection Capabilities For Environmental Sample Analysis Lower Limits of Detection |
| 3.12.2 | Section 3/4.12.2 | Land Use Census |
| 3.12.3 | Section 3/4.12.3 | Interlaboratory Comparison Program |
| 3/4.3.3.10 | Section 3/4.3 | Radioactive Liquid Effluent Monitoring Instrumentation Basis |
| 3/4.3.3.11 | Section 3/4.3 | Radioactive Gaseous Effluent Monitoring Instrumentation Basis |
| 3/4.11.1.1 | Section 3/4.11 | Liquid Effluents Concentration Basis |
| 3/4.11.1.2 | Section 3/4.11 | Liquid Effluents Dose Basis |
| 3/4.11.1.3 | Section 3/4.11 | Liquid Radwaste Treatment System Basis |
| 3/4.11.2.1 | Section 3/4.11 | Gaseous Effluents Dose Rate Basis |
| 3/4.11.2.2 | Section 3/4.11 | Gaseous Effluents Dose - Noble Gases Basis |
| 3/4.11.2.3 | Section 3/4.11 | Gaseous Effluents Dose - I-131, I-133, Tritium and Particulates Basis |
| 3/4.11.2.4 | Section 3/4.11 | Gaseous Radwaste Treatment System Basis |
| 3/4.11.4 | Section 3/4.11 | Total Dose Basis |
| 3/4.12.1 | Section 3/4.12 | Radiological Environmental Monitoring Program Basis |
| 3/4.12.2 | Section 3/4.12 | Land Use Census Basis |
| 3/4.12.3 | Section 3/4.12 | Interlaboratory Comparison Program Basis |