

MEMORANDUM FOR RECORD

SUBJECT: Supplemental Hypothetical Resident Gardener Soil Risk Characterization of St. Louis Downtown Site (SLDS) Group 1 Properties, Associated with the Inaccessible Soil Operable Unit (ISOU), Using SLDS Background Risks Based on Average Concentrations Versus Ninety-Five Percent Upper Confidence Limit (95% UCL) Concentrations

STATEMENT OF BASIS

During development of U.S. Army Corps of Engineers (USACE) *Remedial Investigation and Baseline Risk Assessment Report for the Inaccessible Soil Operable Unit at the St. Louis Downtown Site* (USACE 2012) (ISOU RI/BRA), soil radiological risks above background (i.e., risks attributable to past Manhattan Engineer District/U.S. Atomic Energy Commission [MED/AEC]-related contamination) were characterized for a number of receptor scenarios for SLDS plant properties and industrial/commercial Vicinity Property (VP) associated with ISOU media. The majority of the receptor scenarios are consistent with the current and expected future land use of the SLDS, which is primarily industrial/commercial, with some recreational use. These scenarios, each of which is described in detail in the ISOU RI/BRA, included the following receptors who are assumed to be exposed to inaccessible soil at the SLDS: industrial worker (SLDS/VP employees potentially exposed to inaccessible soil), construction workers (contractors potentially exposed to inaccessible soil), utility workers (utility employees/contractors potentially exposed to inaccessible soil during underground utility work), sewer utility worker (MSD workers potentially exposed to soil adjacent to sewer lines), recreational user of the St. Louis Riverfront Trail (potentially exposed to inaccessible soil beneath the St. Louis Flood Protection Levee System for the Mississippi River.) The St. Louis Riverfront Trail runs along the top of the levee and is used recreationally for activities such as jogging, hiking, and bicycle riding.

The results of the risk assessment for the aforementioned scenarios showed that there are no unacceptable MED/AEC-related risks posed by soil at a number of SLDS properties (i.e., referred hereafter as the “Group 1 Properties”). Those risk assessment results were subsequently used as the basis for recommending No Further Action in the *Proposed Plan for No Further Action for the Inaccessible Soil Operable Unit Associated with Group 1 Properties at the St. Louis Downtown Site, St. Louis, Missouri* (ISOU PP) (USACE 2014) for properties/property groups at the SLDS identified as “Group 1 Properties.”

Although the current and expected future land use of the SLDS is industrial/commercial with some recreational use, hypothetical future use was also evaluated based on a hypothetical resident gardener scenario. The hypothetical resident gardener scenario includes adults and children living on redeveloped SLDS properties, who are assumed to be exposed to MED/AEC-related contaminants in inaccessible soil and fruits and vegetables homegrown in inaccessible soil areas. This scenario is considered hypothetical because it does not realistically reflect the current and expected land use of properties at the SLDS for the foreseeable future. The hypothetical resident gardener scenario was evaluated in the ISOU RI/BRA in response to stakeholder interest because it represents the highest soil exposure rates of all receptors evaluated in the RI/BRA, and is therefore, the most-health conservative receptor scenario for the Group 1 Properties. As such, presentation of the risk results for the hypothetical resident gardener in the

ISOU PP, which also demonstrates that there are no unacceptable MED/AEC-related risks posed by soil at soil at the Group 1 Properties, further supports the selected remedy of No Further Action for ISOU media at the Group 1 Properties.

Because recommendations for No Further Action in the ISOU PP are based on property-specific risks relative to background risk, the manner in which background data are utilized in the ISOU RI/BRA became a point of interest with State and Federal regulators. This is because risks calculated for the SLDS accessible soil and ground-water operable unit (OU) have historically been based on average SLDS background values and the risks calculated in the ISOU RI/BRA were based on 95% UCL SLDS background values.

The USACE is issuing this memorandum to document the outcome of the hypothetical resident gardener risk assessment and recommendations for No Further Action for the Group 1 Properties identified in the ISOU PP, if average background risks are applied to the risk characterization, rather than background risks based on the 95% UCL. Although the hypothetical resident gardener scenario, as previously stated, does not reflect the current and expected future use of the SLDS (including the Group 1 Properties), the hypothetical resident gardener scenario was identified as the focus of this memorandum because it represents the most health-conservative scenario of all the receptor scenarios that were evaluated in the ISOU RI/BRA. A finding of no unacceptable soil risks to the hypothetical resident gardener is an indicator that there are no unacceptable soil risks to the other receptors evaluated at lower exposure rates (i.e., the industrial worker, construction worker, utility worker, sewer utility worker, and recreational users).

RISK EVALUATION OF THE HYPOTHETICAL RESIDENT GARDENER SCENARIO AT THE GROUP 1 PROPERTIES

In response to stakeholder interest, the hypothetical resident gardener evaluations were conducted as part of the ISOU RI/BRA in order to further support the recommendation for No Further Action for ISOU media at a subgroup of SLDS properties referred to as the “Group 1 Properties” in the ISOU PP. The basis for the recommendation was the finding of no unacceptable MED/AEC-related risks to receptor scenarios that realistically reflect current land use, as well as land use expected for the reasonably foreseeable future (i.e., industrial worker, construction worker, utility worker, sewer utility worker and recreational user of the St. Louis Riverfront Trail). This land use is primarily industrial/commercial with some recreational use.

The Group 1 Properties include the following individual properties and property groups (see Figure 1): one Mallinckrodt property (Mallinckrodt Security Gate 49), six VPs (DT-4 South, DT-8, DT-9 Levee, DT-15, DT-29, DT-34), and two property groups (South of Angelrodt Property Group and West of Broadway Property Group). The South of Angelrodt Property Group consists of DT-5, DT-13, DT-14, DT-16, DT-17, and DT-18. The West of Broadway Property Group consists of Plant 3, Plant 8, Plant 9, Plant 11, the Mallinckrodt parking lots, and DT-20, DT-21, DT-22, DT-23, DT-24, DT-25, DT-26, DT-27, DT-28, DT-30, DT-35, and DT-36. The identification of these properties as Group 1 Properties was made in the ISOU PP (USACE 2014), which was finalized after the 2012 ISOU RI/BRA; therefore, there is no mention of Group 1 Properties in the ISOU RI/BRA.

Similar to all other “non-residential” receptor scenarios evaluated in the RI/BRA, the hypothetical resident gardener risks were estimated for soil suspected of being contaminated by past MED/AEC processes that supported the nation’s early atomic weapons development

program. The MED/AEC-related contaminants retained for evaluation of inaccessible soil in the ISOU RI/BRA were initially identified in USACE's *Remedial Investigation Work Plan for the Inaccessible Soil Operable Unit at the St. Louis Downtown Site, St. Louis, Missouri* (ISOU RI WP) (USACE 2009). These contaminants included radionuclides, which are presented in Table 1. Of those contaminants initially identified in the ISOU RI WP, contaminants of potential concern (COPCs) for inaccessible soil were identified for quantitative risk evaluation in the baseline risk assessment (BRA) portion of the RI/BRA. In the RI/BRA, an inaccessible soil COPC was identified as a contaminant with at least one detection across all SLDS ISOU properties (including the Group 1 Properties) exceeding a corresponding U.S. Environmental Protection Agency (USEPA)-established risk-based preliminary remediation goal. The inaccessible soil COPCs evaluated in the BRA included only radiological parameters: actinium (Ac)-227, protactinium (Pa)-231, radium (Ra)-226, Ra-228, thorium (Th)-230, Th-232, uranium (U)-235, and U-238. Of the initial list of contaminants identified in the RI WP (see Table 1), only Th-228 was not retained as a COPC for quantitative risk evaluation in the BRA. As will be discussed later, the overall finding of the RI/BRA is that there are no unacceptable MED/AEC-related risks posed by the COPCs in inaccessible soil at the Group 1 Properties, for all evaluated receptor scenarios. Therefore, this indicates that there are no contaminants of concern present in the inaccessible soil at these properties.

In the RI/BRA, potential MED/AEC-related cancer risks posed by exposures to inaccessible soil COPCs to all evaluated receptors were calculated and compared with USEPA's acceptable cancer risk range of 1×10^{-6} to 1×10^{-4} . Additionally, property-wide soil risks were calculated for some receptors, including the hypothetical resident gardener, to represent combined soil exposures in inaccessible soil and accessible soil areas at each property. A property-wide risk was calculated as an area-weighted average of the inaccessible soil area risk with the accessible soil area risk. The accessible soil COPCs used in the evaluation of property-wide risk are those listed in Table 1. Although, the focus of the RI/BRA was inaccessible soil, and many of the accessible soil areas of the Group 1 Properties had already been remediated under authority of the 1998 *Record of Decision for the St. Louis Downtown Site* (1998 ROD) (USACE 1998) for the Accessible Soil and Ground-Water Operable Unit of the SLDS, the calculation of a property-wide risk checks whether the inaccessible soil risk contribution causes the property-wide risk to exceed USEPA's acceptable risk range. This is important because the property-wide risk reflects the assumed probability of exposure for some receptors, including the hypothetical resident gardener, who may move about the entire property.

In addition to the risks that were calculated from soil exposures to MED/AEC-related COPCs at the Group 1 Properties, cancer risk can also come from naturally occurring radionuclides in the environment around SLDS, as well as from manmade (anthropogenic) sources not related to past MED/AEC processes. Cancer risks that exist as a result of naturally occurring and anthropogenic conditions are referred to as background cancer risk (or background risk). Although the scope of the RI/BRA is limited to determining property risks from MED/AEC-related contamination, background risk contributions were included in the overall risk characterization of each Group 1 Property. According to USEPA (1989), inclusion of background risk contributions in the risk assessment is consistent with the process established under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and is a recommended methodology for the purposes of risk characterization. This allows for a more complete characterization of overall risk at a property and facilitates a determination of that portion of overall risk that is attributable to past MED/AEC processes. However, as actions move beyond the risk assessment phase of the

CERCLA process to the PP, risk contributions from background become more scrutinized when making determinations of the need for action versus No Further Action.

THE ROLE OF BACKGROUND IN RISK ASSESSMENTS CONDUCTED FOR SLDS PROPERTIES

During preparation of the ISOU RI/BRA, existing soil background data available for radiological contaminants previously identified in the RI WP were utilized to calculate background risks for the all soil receptor scenarios, including that of the hypothetical resident gardener. The soil background data are specific to the SLDS as the data were acquired from soil samples collected in the vicinity of the SLDS during a 1999 investigation. The sampled soil background locations had been determined as being in areas that were not affected by past MED/AEC-related contaminant releases. A description of the background soil sampling investigation and a presentation of the associated data summaries are documented in the *Background Soils Characterization Report for the St. Louis Downtown Site* (SLDS Background Report) (USACE 1999).

Both property-specific and background cancer risks were calculated in the ISOU RI/BRA based on an exposure point concentration (EPC) calculated for each contaminant that was equivalent to the lesser of 95% UCL or the maximum detected concentration, as determined from the 1999 SLDS soil background data. Calculating cancer risks using this methodology is consistent with existing USEPA CERCLA guidance (1992 and 2002). The USACE calculates all 95% UCLs by utilizing the most recent version of USEPA's ProUCL statistical software package.

However, past and ongoing dose and risk assessments conducted for accessible soil as part of Final Status Survey Evaluations (FSSEs) for a number of SLDS properties under the authority of the 1998 ROD utilized average background concentrations, rather than 95% UCL background concentrations. This is because soil risk contributions from background are not quantified in the FSSEs as they were in the ISOU RI/BRA. Rather, average background concentrations are used to calculate contaminant-specific EPCs by subtracting the average background concentration from the lesser of 95% UCL and the maximum detected concentration determined for the property/site. The resulting EPC is then used to calculate the risk in the FSSE for an accessible soil area that is interpreted as risk above background. These assessments have been conducted, and continue to be conducted, in order to determine the status of accessible soil areas relative to meeting the requirements of the 1998 ROD. This methodology has become standard practice for characterizing accessible soil risks at the SLDS in all FSSEs conducted since the signing of the 1998 ROD, which have been reviewed and approved by State and Federal regulators.

During development of the ISOU PP, the USACE received regulator comments that questioned the use of background values (BVs) that differed from those used for the FSSEs prepared under the 1998 ROD. Specifically, the comments noted that BVs used in the RI/BRA, which are based on 95% UCLs, are higher than those used in the FSSEs, which are based on average concentrations. Both the 95% UCL BVs and the average BVs calculated for the SLDS are presented in Table 1. Because of this difference, the regulator comments raised additional concerns that calculating property-specific risks above average background risk levels (per the FSSEs) is a more health-conservative methodology than calculating property-specific risks above background risk levels based on the 95% UCL. This is because the average background risk is typically a smaller value than a 95% UCL risk; therefore, the average background risk would present a more stringent background risk with which to compare the property-specific risk.

Consequently, the ultimate concern becomes that the application of the average background risk to property-specific risks could result in the withdrawal of the recommendation of No Further Action for ISOU media from one or more of the Group 1 Properties identified above. However, this would only occur if the property-specific risks attributed to MED/AEC-related contamination were found to be greater than both USEPA's acceptable risk range and the average background risk.

It is the USACE's position that the use of the 95% UCL for calculating a BV is appropriate for determining risk contributions due to background because it is consistent with USEPA (1992 and 2002) methodology for calculating a risk for an area that represents USEPA's reasonable maximum exposure scenario. In this case, the area being evaluated for risk is the "background area" for the SLDS. It is also the USACE's position that subtraction of the average BV from the EPC during a dose and risk assessment conducted as part of a FSSE under the 1998 ROD is appropriate because it ultimately results in health-conservative calculations of dose and risk above background. However, because the USACE shares the concerns of the regulators that application of the average (instead of the 95% UCL) background risk to property-specific risks could result in the withdrawal of the recommendation of No Further Action at one or more of the Group 1 Properties, the USACE has conducted an evaluation that compares the effects of both sets of BVs on the overall risk outcome for each Group 1 Property.

CALCULATION OF HYPOTHETICAL RESIDENT GARDENER SCENARIO UTILIZING AVERAGE VERSUS 95%UCL BACKGROUND RISKS

In order to address the concerns discussed above, radiological cancer risks for the hypothetical resident gardener at the Group 1 Properties have been calculated using EPCs equivalent to both average and 95% UCL background concentrations. As previously stated, the hypothetical resident gardener scenario was used in this evaluation because it represents the most health-conservative scenario of all the receptor scenarios that were evaluated in the ISOU RI/BRA. A finding of no unacceptable soil risks to the hypothetical resident gardener is an indicator that there are no unacceptable soil risks to the other receptors evaluated at lower exposure rates (i.e., the industrial worker, construction worker, utility worker, sewer utility worker, and recreational users). The radionuclide-specific EPCs used in the evaluation are the average and 95% UCL BVs that are presented in Table 1 and that were obtained from Table 3-1 of the SLDS Background Report.

Table 2 shows that the average background risk (7.2×10^{-4}) calculated for the hypothetical resident gardener is slightly less than the 95% UCL background risk (7.9×10^{-4}). Based on exposure assumptions used in the ISOU RI/BRA, all inaccessible soil risks, accessible soil risks, property-wide risks (for individual VPs) and combined property risks (for the South of Angelrod and West of Broadway Property Groups) exceed USEPA's acceptable risk range, when background contributions to the property risks are included. However, when considering property risks above background, which theoretically corresponds to risks resulting from MED/AEC-related contamination, the outcomes are not significantly different when either the average or the 95% UCL background risks are utilized. In other words, the MED/AEC-related risks are less than the corresponding background risk (indicated in Table 2 by "<BKGD") or are within USEPA's acceptable risk range of 1×10^{-6} to 1×10^{-4} .

The RESRAD output files supporting the findings presented in Table 2 are provided as attachments as listed below.

- Attachment A – RESRAD Output for 95% UCL Background Cancer Risks Calculated for Hypothetical Resident Gardener Exposures to Inaccessible Soil
- Attachment B - RESRAD Output for 95% UCL Background Cancer Risks Calculated for Hypothetical Resident Gardener Exposures to Accessible Soil
- Attachment C - RESRAD Output for Average Background Cancer Risks Calculated for Hypothetical Resident Gardener Exposures to Inaccessible Soil
- Attachment D - RESRAD Output for Average Background Cancer Risks Calculated for Hypothetical Resident Gardener Exposures to Accessible Soil

RESRAD output files for 95% UCL background cancer risks presented as Attachments A and B were obtained directly from the ISOU RI/BRA.

CONCLUSIONS

Although application of average BVs to risk evaluations of a hypothetical resident gardener result in slightly greater risks for the Group 1 Properties than application of 95% UCL BVs, the outcomes are similar. In other words, the property-wide MED/AEC-related (i.e., risks above background) using both methods are less than the corresponding SLDS background risk and are less than USEPA's acceptable risk range of 1×10^{-6} to 1×10^{-4} . In the case of DT-8, the property-wide risk based on the application of 95% UCL BVs is also less than the corresponding SLDS background risk and USEPA's acceptable risk range; however, the property-wide risk based on the average BV is greater than the corresponding background risk, but is still within USEPA's acceptable risk range. Therefore, even if average background were applied to the RI/BRA risk evaluations for any or all of the receptors at the Group 1 Properties, the recommendation for No Further Action for ISOU media remains unchanged.

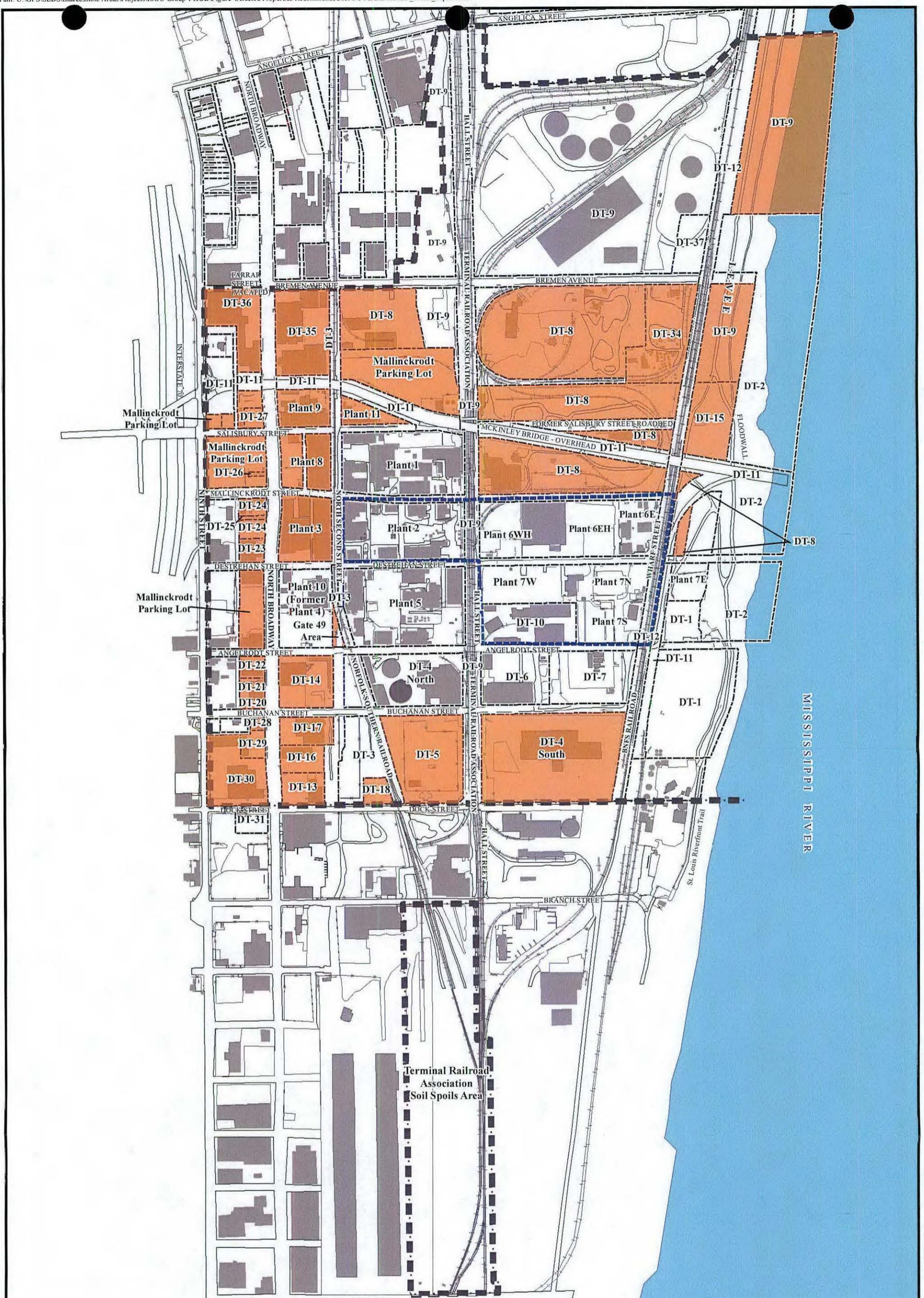
REFERENCES

- USACE (1998). *Record of Decision for the St. Louis Downtown Site*. Final, October.
- USACE (1999). *Background Soils Characterization Report for the St. Louis Downtown Site*. March.
- USACE (2012a). *Remedial Investigation and Baseline Risk Assessment Report for the Inaccessible Soil Operable Unit at the St. Louis Downtown Site, St. Louis, Missouri*. Final, September.
- USACE (2012b). *Post-Remedial Action Report and Final Status Survey Evaluation for the Accessible Soils within the St. Louis Downtown Site Vicinity Property Gunther Salt (DT-4)*. Revision 0. September 14.
- USACE (2014). *Proposed Plan for No Further Action for the Inaccessible Soil Operable Unit Associated with Group 1 Properties at the St. Louis Downtown Site, St. Louis, Missouri*. Final, January.

USEPA,(1989). *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual, Part A*, Office of Solid Waste and Emergency Response, EPA/540/1-89/002, Washington, D.C. December.

USEPA (1992). *Supplemental Guidance to RAGS: Calculating the Concentration Term*, Office of Solid Waste and Emergency Response, Publication 9285.7-08I, Washington, D.C. May.

USEPA (2002). *Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites*, Office of Emergency and Remedial Response, OSWER Directive 9285.6-10, Washington, D.C. December.

**LEGEND**

- Property Boundary
- Uranium-Ore Processing Areas as Defined by the 1998 ROD
- SLDS Boundary
- Building or Tank
- River/Stream
- Fence
- Railroad
- No Further Action Properties

MO-East State Plane
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FeetDRAWN BY:
KLP, DJH, DLL
REV.: 1
DATE: 3/26/2014**FUSRAP**

Figure 1. Group 1 Properties Recommended for No Further Action

Table 1. Soil Exposure Point Concentrations Used for Calculating 95% UCL and Average Background Risks

| Radiological Contaminant ^a | EPCs for Determining Background Risk (pCi/g) ^b | |
|---------------------------------------|---|----------------------|
| | 95% UCL ^c | Average ^d |
| Actinium-227 | 0.18 | 0.14 |
| Protactinium-231 | 1.12 | 0.90 |
| Lead-210 | NA | NA |
| Radium-226 (Alpha) | 3.04 | 2.78 |
| Radium-228 (Gamma) | 1.00 | 0.95 |
| Thorium-228 (Alpha) | 1.26 | 1.16 |
| Thorium-230 (Alpha) | 2.18 | 1.94 |
| Thorium-232 (Alpha) | 1.18 | 1.09 |
| Uranium-234 (Gamma) | NA | NA |
| Uranium-235 (Gamma) | 0.1 | 0.08 |
| Uranium-238 (Alpha) | 1.67 | 1.44 |

^a All radionuclides in the above list were COPCs used in the risk evaluations of accessible soil areas of the Group 1 Properties in the ISOU RI/BRA (USACE 2012). The same list of radionuclides, with the exception of Th-228, was used as the COPCs for the risk evaluations of inaccessible soil areas of the Group 1 Properties.

^b The 95% UCL and average background values (BVs) were obtained from Table 3-1 of the USACE's (1999) "Background Soils Characterization Report for the St. Louis Downtown Site."

^c 95% UCL BVs were used as the basis for determining background risks in the ISOU RI/BRA.

^d Average background values have been used to determine EPCs above background for all past and present dose and risk assessments, conducted under the 1998 SLDS ROD, for accessible soil areas.

Table 2. SLDS Group 1 Property-Specific Radiological Risk Characterization for Inaccessible Soil and Accessible Soil Above 95%UCL Background Risk Versus Average Background Risk: Hypothetical Resident Gardener

| Property | Soil Operable Unit | Area (m ²) | Resident Gardener Risk Based on 95% UCL Background | | Resident Gardener Risk Based on Average Background | |
|--|----------------------------------|------------------------|--|------------------------------------|--|------------------------------------|
| | | | Risk with Background | Risk above Background ^a | Risk with Background | Risk above Background ^a |
| SLDS Background ^b | Inaccessible ^c | 10,000 | 7.9E-04 | NA | 7.2E-04 | NA |
| | Accessible ^c | 10,000 | 7.9E-04 | NA | 7.2E-04 | NA |
| | Area-Wide ^d | 20,000 | 7.9E-04 | NA | 7.2E-04 | NA |
| <i>Mallinckrodt Properties</i> | | | | | | |
| Mallinckrodt Security Gate 49 | Inaccessible ^c | 5 | 3.0E-04 | <BKGD | 3.0E-04 | <BKGD |
| | Accessible ^c | 435 | 6.1E-04 | <BKGD | 6.1E-04 | <BKGD |
| | Property-Wide ^d | 440 | 6.1E-04 | <BKGD | 6.1E-04 | <BKGD |
| <i>Industrial/Commercial Vicinity Properties</i> | | | | | | |
| DT-4 South | Inaccessible | NA | ISOU Not Impacted - Eliminated from RI/BRA Evaluations | | | |
| | Accessible ^c | NA | NA | NA | NA | 7.8E-05 ^e |
| | Property-Wide | NA | ISOU Not Impacted - Eliminated from RI/BRA Evaluations | | | |
| DT-8 | Inaccessible ^c | 20,471 | 6.8E-04 | <BKGD | 6.8E-04 | <BKGD |
| | Accessible ^c | 85,560 | 8.1E-04 | 1.4E-05 | 8.1E-04 | 8.3E-05 |
| | Property-Wide ^d | 106,031 | 7.8E-04 | <BKGD | 7.8E-04 | 5.8E-05 |
| DT-29 | Inaccessible ^c | 533 | 3.8E-04 | <BKGD | 3.8E-04 | <BKGD |
| | Accessible ^c | 1,345 | 8.2E-04 | 3.1E-05 | 8.2E-04 | 1.0E-04 |
| | Property-Wide ^d | 1,878 | 7.0E-04 | <BKGD | 7.0E-04 | <BKGD |
| DT-34 | Inaccessible ^c | 5,169 | 7.4E-04 | <BKGD | 7.4E-04 | 1.5E-05 |
| | Accessible ^c | 9,457 | 5.2E-04 | <BKGD | 5.2E-04 | <BKGD |
| | Property-Wide ^d | 14,626 | 6.0E-04 | <BKGD | 6.0E-04 | <BKGD |
| South of Angelrodt Property Group | Inaccessible ^c | 6,508 | 7.2E-04 | <BKGD | 7.2E-04 | <BKGD |
| | Accessible ^c | 34,159 | 6.8E-04 | <BKGD | 6.8E-04 | <BKGD |
| | Combined Properties ^d | 40,667 | 6.8E-04 | <BKGD | 6.8E-04 | <BKGD |
| West of Broadway Property Group | Inaccessible ^c | 33,043 | 6.0E-04 | <BKGD | 6.0E-04 | <BKGD |
| | Accessible ^c | 50,847 | 6.7E-04 | <BKGD | 6.7E-04 | <BKGD |
| | Combined Properties ^d | 83,890 | 6.4E-04 | <BKGD | 6.4E-04 | <BKGD |
| <i>Levee Properties</i> | | | | | | |
| DT-9 Levee | Inaccessible ^c | 84,920 | 5.1E-04 | <BKGD | 5.1E-04 | <BKGD |
| | Accessible ^c | 188,158 | 7.5E-04 | <BKGD | 7.5E-04 | 2.0E-05 |
| | Property-Wide ^d | 273,078 | 6.7E-04 | <BKGD | 6.7E-04 | <BKGD |
| DT-15 | Inaccessible ^c | 5,505 | 6.5E-04 | <BKGD | 6.5E-04 | <BKGD |
| | Accessible ^c | 3,754 | 4.9E-04 | <BKGD | 4.9E-04 | <BKGD |
| | Property-Wide ^d | 9,259 | 5.8E-04 | <BKGD | 5.8E-04 | <BKGD |

^a For each area/property, risk above background is calculated as the difference between risk with background and the background risk. The values reported in the "Background" rows, are the actual risks estimated for background used in the calculations of risk above background.

^b The RESRAD default value of 10,000 m² was applied as the assumed area each for inaccessible soil and accessible soil areas for all receptor scenarios. Area-wide background risk calculations for soil assume a total area of 20,000 m² for combined inaccessible and accessible soil areas for the industrial worker and recreational user scenarios, with 50 percent of the total background area assumed to be inaccessible soil and 50 percent of the total background area assumed to be accessible soil.

^c ISOU and accessible soil risk calculations for the resident gardener assumes no ground cover is present.

^d Property-wide risks are calculated as the area-weighted averages of inaccessible and accessible soil risks.

^e The DT-4 South accessible risk above average background that is presented in the above table is the highest residual risk reported for all of DT-4 (i.e., north and south parcels combined) following post-remedial risk evaluations conducted under the 1998 ROD (USACE 2012b).

NA - Not applicable. For DT-4 South, the use of area-weighted average risks are not applicable because the inaccessible soil area was determined in the RI WP to be non-impacted; therefore, DT-4 South was not evaluated in the RI/BRA.

<BKGD - Indicates that the risk associated with the property (i.e., for inaccessible soil, accessible soil, or property-wide soil) is within the range of background.

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| Amount of Intake Quantities and Excess Cancer Risks | |
| Time= 0.000E+00 | 5 |
| Time= 1.000E+00 | 8 |
| Time= 3.000E+00 | 11 |
| Time= 1.000E+01 | 14 |
| Time= 7.000E+01 | 17 |
| Time= 1.000E+02 | 20 |
| Time= 3.000E+02 | 23 |
| Time= 1.000E+03 | 26 |

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Cancer Risk Slope Factors Summary Table
 Risk Library: HEAST 2001 Morbidity

| 0 Menu | Parameter | Current Value | Base Case* | Parameter Name |
|-----------|---|---------------|------------|----------------|
| Sf-1 | Ground external radiation slope factors, $\text{L}/\text{yr per (pCi/g)}$: | | | |
| Sf-1 | Ac-227+D | 1.47E-06 | 3.48E-10 | SLPF(1,1) |
| Sf-1 | Pa-231 | 1.39E-07 | 1.39E-07 | SLPF(2,1) |
| Sf-1 | Pb-210+D | 4.21E-09 | 1.41E-09 | SLPF(3,1) |
| Sf-1 | Ra-226+D | 8.49E-06 | 2.29E-08 | SLPF(4,1) |
| Sf-1 | Ra-228+D | 4.53E-06 | 0.30E+00 | SLPF(5,1) |
| Sf-1 | Th-228+D | 7.76E-06 | 5.59E-09 | SLPF(6,1) |
| Sf-1 | Th-230 | 8.19E-10 | 8.19E-10 | SLPF(7,1) |
| Sf-1 | Th-232 | 3.42E-10 | 3.42E-10 | SLPF(8,1) |
| Sf-1 | U-234 | 2.52E-10 | 2.52E-10 | SLPF(9,1) |
| Sf-1 | U-235+D | 5.43E-07 | 5.18E-07 | SLPF(10,1) |
| Sf-1 | U-238 | 4.99E-11 | 4.99E-11 | SLPF(11,1) |
| Sf-1 | U-238+D | 1.14E-07 | 4.99E-11 | SLPF(12,1) |
| Sf-2 | Inhalation, slope factors, $1/(pCi)$: | | | |
| Sf-2 | Ac-227+D | 2.09E-07 | 1.49E-07 | SLPF(1,2) |
| Sf-2 | Pa-231 | 4.55E-08 | 4.55E-08 | SLPF(2,2) |
| Sf-2 | Pb-210+D | 1.39E-08 | 2.77E-09 | SLPF(3,2) |
| Sf-2 | Ra-226+D | 1.16E-08 | 1.15E-08 | SLPF(4,2) |
| Sf-2 | Ra-228+D | 5.23E-09 | 5.18E-09 | SLPF(5,2) |
| Sf-2 | Th-228+D | 1.43E-07 | 1.32E-07 | SLPF(6,2) |
| Sf-2 | Th-230 | 2.85E-08 | 2.85E-08 | SLPF(7,2) |
| Sf-2 | Th-232 | 4.33E-08 | 4.33E-08 | SLPF(8,2) |
| Sf-2 | U-234 | 1.14E-08 | 1.14E-08 | SLPF(9,2) |
| Sf-2 | U-235+D | 1.01E-08 | 1.01E-08 | SLPF(10,2) |
| Sf-2 | U-238 | 9.32E-09 | 9.32E-09 | SLPF(11,2) |
| Sf-2 | U-238+D | 9.35E-09 | 9.32E-09 | SLPF(12,2) |
| Sf-3 | Food ingestion, slope factors, $1/(pCi)$: | | | |
| Sf-3 | Ac-227+D | 6.53E-10 | 2.45E-10 | SLPF(1,3) |
| Sf-3 | Pa-231 | 2.26E-10 | 2.26E-10 | SLPF(2,3) |
| Sf-3 | Pb-210+D | 3.44E-09 | 1.18E-09 | SLPF(3,3) |
| Sf-3 | Ra-226+D | 5.15E-10 | 5.14E-10 | SLPF(4,3) |
| Sf-3 | Ra-228+D | 1.43E-09 | 1.43E-09 | SLPF(5,3) |
| Sf-3 | Th-228+D | 4.22E-10 | 1.43E-10 | SLPF(6,3) |
| Sf-3 | Th-230 | 1.19E-10 | 1.19E-10 | SLPF(7,3) |
| Sf-3 | Th-232 | 1.33E-10 | 1.33E-10 | SLPF(8,3) |
| Sf-3 | U-234 | 9.55E-11 | 9.55E-11 | SLPF(9,3) |
| Sf-3 | U-235+D | 9.76E-11 | 9.44E-11 | SLPF(10,3) |
| Sf-3 | U-238 | 8.66E-11 | 8.66E-11 | SLPF(11,3) |
| Sf-3 | U-238+D | 1.21E-10 | 8.66E-11 | SLPF(12,3) |
| Sf-3 | Water ingestion, slope factors, $1/(pCi)$: | | | |
| Sf-3 | Ac-227+D | 4.86E-10 | 2.01E-10 | SLPF(1,4) |
| Sf-3 | Pa-231 | 1.73E-10 | 1.73E-10 | SLPF(2,4) |
| Sf-3 | Pb-210+D | 1.27E-09 | 8.81E-10 | SLPF(3,4) |
| Sf-3 | Ra-226+D | 3.86E-10 | 3.85E-10 | SLPF(4,4) |
| Sf-3 | Ra-228+D | 1.04E-09 | 1.04E-09 | SLPF(5,4) |
| Sf-3 | Th-228+D | 3.00E-10 | 1.07E-10 | SLPF(6,4) |
| Sf-3 | Th-230 | 9.10E-11 | 9.10E-11 | SLPF(7,4) |

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Cancer Risk Slope Factors Summary Table (continued)
 Risk Library: HEAST 2001 Morbidity

| 0 Menu | Parameter | Current Value | Base Case* | Parameter Name |
|-----------|--|---------------|------------|----------------|
| Sf-3 | Th-232 | 1.01E-10 | 1.01E-10 | SLPF(8,4) |
| Sf-3 | U-234 | 7.07E-11 | 7.07E-11 | SLPF(9,4) |
| Sf-3 | U-235+D | 7.18E-11 | 6.96E-11 | SLPF(10,4) |
| Sf-3 | U-238 | 6.40E-11 | 6.40E-11 | SLPF(11,4) |
| Sf-3 | U-238+D | 8.71E-11 | 6.40E-11 | SLPF(12,4) |
| Sf-3 | Soil ingestion, slope factors, 1/(pCi): | | | |
| Sf-3 | Ac-227+D | 1.16E-09 | 3.81E-10 | SLPF(1,5) |
| Sf-3 | Pa-231 | 3.74E-10 | 3.74E-10 | SLPF(2,5) |
| Sf-3 | Pb-210+D | 2.66E-09 | 1.84E-09 | SLPF(3,5) |
| Sf-3 | Ra-226+D | 7.30E-10 | 7.29E-10 | SLPF(4,5) |
| Sf-3 | Ra-228+D | 2.29E-09 | 2.28E-09 | SLPF(5,5) |
| Sf-3 | Th-228+D | 8.09E-10 | 2.89E-10 | SLPF(6,5) |
| Sf-3 | Th-230 | 2.02E-10 | 2.02E-10 | SLPF(7,5) |
| Sf-3 | Th-232 | 2.31E-10 | 2.31E-10 | SLPF(8,5) |
| Sf-3 | U-234 | 1.58E-10 | 1.58E-10 | SLPF(9,5) |
| Sf-3 | U-235+D | 1.63E-10 | 1.57E-10 | SLPF(10,5) |
| Sf-3 | U-238 | 1.43E-10 | 1.43E-10 | SLPF(11,5) |
| Sf-3 | U-238+D | 2.10E-10 | 1.43E-10 | SLPF(12,5) |
| Sf-Rn | Radon Inhalation slope factors, 1/(pCi): | | | |
| Sf-Rn | Rn-222 | 1.80E-12 | 1.80E-12 | SLPFRN(1,1) |
| Sf-Rn | Po-218 | 3.70E-12 | 3.70E-12 | SLPFRN(1,2) |
| Sf-Rn | Pb-214 | 6.20E-12 | 6.20E-12 | SLPFRN(1,3) |
| Sf-Rn | Bi-214 | 1.50E-11 | 1.50E-11 | SLPFRN(1,4) |
| Sf-Rn | Rn-220 | 1.90E-13 | 1.90E-13 | SLPFRN(2,1) |
| Sf-Rn | Po-216 | 3.00E-15 | 3.00E-15 | SLPFRN(2,2) |
| Sf-Rn | Pb-212 | 3.90E-11 | 3.90E-11 | SLPFRN(2,3) |
| Sf-Rn | Bi-212 | 3.70E-11 | 3.70E-11 | SLPFRN(2,4) |
| Sf-Rn | Radon K factors, (mrem/WLM) : | | | |
| Sf-Rn | Rn-222 Indoor | 7.60E+02 | 7.60E+02 | KFACTR(1,1) |
| Sf-Rn | Rn-222 Outdoor | 5.70E+02 | 5.70E+02 | KFACTR(1,2) |
| Sf-Rn | Rn-220 Indoor | 1.50E+02 | 1.50E+02 | KFACTR(2,1) |
| Sf-Rn | Rn-220 Outdoor | 2.50E+02 | 2.50E+02 | KFACTR(2,2) |

*Base Case means Default.Lib w/o Associate Nuclide contributions.

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| ONuclide (i) | Slope(i)* (i) | Risk Slope and Environmental Transport Factors for the Ground Pathway | | | | | | | |
|-----------------|------------------|---|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | | t= 0.000E+00 | 1.000E+00 | 3.000E+00 | 1.000E+01 | 7.000E+01 | 1.000E+02 | 3.000E+02 | 1.000E+03 |
| Ac-227 | 3.480E-10 | 5.151E-01 | 5.151E-01 | 5.151E-01 | 5.151E-01 | 5.151E-01 | 5.151E-01 | 5.151E-01 | 5.151E-01 |
| Ac-228 | 4.530E-06 | 5.070E-01 | 5.370E-01 | 5.070E-01 | 5.070E-01 | 5.070E-01 | 5.070E-01 | 5.070E-01 | 5.070E-01 |
| At-218 | 3.570E-09 | 5.224E-01 | 5.224E-01 | 5.224E-01 | 5.224E-01 | 5.224E-01 | 5.224E-01 | 5.224E-01 | 5.224E-01 |
| Bi-210 | 2.760E-09 | 5.088E-01 | 5.088E-01 | 5.088E-01 | 5.088E-01 | 5.088E-01 | 5.088E-01 | 5.088E-01 | 5.088E-01 |
| Bi-211 | 1.880E-07 | 5.089E-01 | 5.089E-01 | 5.089E-01 | 5.089E-01 | 5.089E-01 | 5.089E-01 | 5.089E-01 | 5.089E-01 |
| Bi-212 | 8.870E-07 | 5.048E-01 | 5.048E-01 | 5.048E-01 | 5.048E-01 | 5.048E-01 | 5.048E-01 | 5.048E-01 | 5.048E-01 |
| Bi-214 | 7.480E-06 | 5.061E-01 | 5.061E-01 | 5.061E-01 | 5.061E-01 | 5.061E-01 | 5.061E-01 | 5.061E-01 | 5.061E-01 |
| Fr-223 | 1.400E-07 | 5.116E-01 | 5.116E-01 | 5.116E-01 | 5.116E-01 | 5.116E-01 | 5.116E-01 | 5.116E-01 | 5.116E-01 |
| Pa-231 | 1.390E-07 | 5.091E-01 | 5.091E-01 | 5.091E-01 | 5.091E-01 | 5.091E-01 | 5.091E-01 | 5.091E-01 | 5.091E-01 |
| Pa-234 | 8.710E-06 | 5.061E-01 | 5.061E-01 | 5.061E-01 | 5.061E-01 | 5.061E-01 | 5.061E-01 | 5.061E-01 | 5.061E-01 |
| Pa-234m | 6.870E-08 | 5.057E-01 | 5.057E-01 | 5.057E-01 | 5.057E-01 | 5.057E-01 | 5.057E-01 | 5.057E-01 | 5.057E-01 |
| Pb-210 | 1.410E-09 | 5.283E-01 | 5.283E-01 | 5.283E-01 | 5.283E-01 | 5.283E-01 | 5.283E-01 | 5.283E-01 | 5.283E-01 |
| Pb-211 | 2.290E-07 | 5.060E-01 | 5.060E-01 | 5.060E-01 | 5.060E-01 | 5.060E-01 | 5.060E-01 | 5.060E-01 | 5.060E-01 |
| Pb-212 | 5.090E-07 | 5.123E-01 | 5.123E-01 | 5.123E-01 | 5.123E-01 | 5.123E-01 | 5.123E-01 | 5.123E-01 | 5.123E-01 |
| Pb-214 | 9.820E-07 | 5.091E-01 | 5.091E-01 | 5.091E-01 | 5.091E-01 | 5.091E-01 | 5.091E-01 | 5.091E-01 | 5.091E-01 |
| Po-210 | 3.950E-11 | 5.056E-01 | 5.056E-01 | 5.056E-01 | 5.056E-01 | 5.056E-01 | 5.056E-01 | 5.056E-01 | 5.056E-01 |
| Po-211 | 3.580E-08 | 5.040E-01 | 5.040E-01 | 5.040E-01 | 5.040E-01 | 5.040E-01 | 5.040E-01 | 5.040E-01 | 5.040E-01 |
| Po-212 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Po-214 | 3.860E-10 | 5.040E-01 | 5.040E-01 | 5.040E-01 | 5.040E-01 | 5.040E-01 | 5.040E-01 | 5.040E-01 | 5.040E-01 |
| Po-215 | 7.480E-10 | 5.067E-01 | 5.067E-01 | 5.067E-01 | 5.067E-01 | 5.067E-01 | 5.067E-01 | 5.067E-01 | 5.067E-01 |
| Po-216 | 7.870E-11 | 5.056E-01 | 5.056E-01 | 5.056E-01 | 5.056E-01 | 5.056E-01 | 5.056E-01 | 5.056E-01 | 5.056E-01 |
| Po-218 | 4.260E-11 | 5.056E-01 | 5.056E-01 | 5.056E-01 | 5.056E-01 | 5.056E-01 | 5.056E-01 | 5.056E-01 | 5.056E-01 |
| Ra-223 | 4.340E-07 | 5.113E-01 | 5.113E-01 | 5.113E-01 | 5.113E-01 | 5.113E-01 | 5.113E-01 | 5.113E-01 | 5.113E-01 |
| Ra-224 | 3.720E-08 | 5.115E-01 | 5.115E-01 | 5.115E-01 | 5.115E-01 | 5.115E-01 | 5.115E-01 | 5.115E-01 | 5.115E-01 |
| Ra-226 | 2.290E-08 | 5.128E-01 | 5.128E-01 | 5.128E-01 | 5.128E-01 | 5.128E-01 | 5.128E-01 | 5.128E-01 | 5.128E-01 |
| Ra-228 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Rn-219 | 2.250E-07 | 5.094E-01 | 5.094E-01 | 5.094E-01 | 5.094E-01 | 5.094E-01 | 5.094E-01 | 5.094E-01 | 5.094E-01 |
| Rn-220 | 1.700E-09 | 5.045E-01 | 5.045E-01 | 5.045E-01 | 5.045E-01 | 5.045E-01 | 5.045E-01 | 5.045E-01 | 5.045E-01 |
| Rn-222 | 1.740E-09 | 5.045E-01 | 5.045E-01 | 5.045E-01 | 5.045E-01 | 5.045E-01 | 5.045E-01 | 5.045E-01 | 5.045E-01 |
| Th-227 | 3.780E-07 | 5.119E-01 | 5.119E-01 | 5.119E-01 | 5.119E-01 | 5.119E-01 | 5.119E-01 | 5.119E-01 | 5.119E-01 |
| Th-228 | 5.590E-09 | 5.142E-01 | 5.142E-01 | 5.142E-01 | 5.142E-01 | 5.142E-01 | 5.142E-01 | 5.142E-01 | 5.142E-01 |
| Th-230 | 8.190E-10 | 5.162E-01 | 5.162E-01 | 5.162E-01 | 5.162E-01 | 5.162E-01 | 5.162E-01 | 5.162E-01 | 5.162E-01 |
| Th-231 | 2.450E-08 | 5.168E-01 | 5.168E-01 | 5.168E-01 | 5.168E-01 | 5.168E-01 | 5.168E-01 | 5.168E-01 | 5.168E-01 |
| Th-232 | 3.420E-10 | 5.188E-01 | 5.188E-01 | 5.188E-01 | 5.188E-01 | 5.188E-01 | 5.188E-01 | 5.188E-01 | 5.188E-01 |
| Th-234 | 1.630E-08 | 5.174E-01 | 5.174E-01 | 5.174E-01 | 5.174E-01 | 5.174E-01 | 5.174E-01 | 5.174E-01 | 5.174E-01 |
| Tl-207 | 1.520E-08 | 5.062E-01 | 5.062E-01 | 5.062E-01 | 5.062E-01 | 5.062E-01 | 5.062E-01 | 5.062E-01 | 5.062E-01 |
| Tl-208 | 1.760E-05 | 5.075E-01 | 5.075E-01 | 5.075E-01 | 5.075E-01 | 5.075E-01 | 5.075E-01 | 5.075E-01 | 5.075E-01 |
| Tl-210 | 0.000E+00 | 5.384E-01 | 5.384E-01 | 5.384E-01 | 5.384E-01 | 5.384E-01 | 5.384E-01 | 5.384E-01 | 5.384E-01 |
| U-234 | 2.520E-10 | 5.192E-01 | 5.192E-01 | 5.192E-01 | 5.192E-01 | 5.192E-01 | 5.192E-01 | 5.192E-01 | 5.192E-01 |
| U-235 | 5.180E-07 | 5.125E-01 | 5.125E-01 | 5.125E-01 | 5.125E-01 | 5.125E-01 | 5.125E-01 | 5.125E-01 | 5.125E-01 |
| U-238 | 4.990E-11 | 5.337E-01 | 5.337E-01 | 5.337E-01 | 5.337E-01 | 5.337E-01 | 5.337E-01 | 5.337E-01 | 5.337E-01 |

* - Units are 1/yr per (pCi/g) at infinite depth and area. Multiplication by ETFG(i,t) converts to site conditions.

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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As pCi/yr at t= 0.000E+00 years

| Radio-Nuclide | Water Independent Pathways (Inhalation w/o radon) | | | | | Water Dependent Pathways | | | | | Total Ingestion* |
|---------------|---|-----------|-----------|-----------|-----------|--------------------------|-----------|-----------|-----------|-----------|------------------|
| | Inhalation | Plant | Meat | Milk | Soil | Water | Fish | Plant | Meat | Milk | |
| Ac-227 | 3.069E-04 | 1.066E+01 | 0.000E+00 | 0.000E+00 | 5.794E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.645E+01 |
| Pa-231 | 1.909E-03 | 2.652E+02 | 0.000E+00 | 0.000E+00 | 3.605E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 3.013E+02 |
| Pb-210 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Ra-226 | 5.183E-03 | 2.880E+03 | 0.000E+00 | 0.000E+00 | 9.785E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.977E+03 |
| Ra-228 | 1.705E-03 | 9.472E+02 | 0.000E+00 | 0.000E+00 | 3.219E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 9.794E+02 |
| Th-228 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Th-230 | 3.717E-03 | 5.166E+01 | 0.000E+00 | 0.000E+00 | 7.017E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.218E+02 |
| Th-232 | 2.012E-03 | 2.796E+01 | 0.000E+00 | 0.000E+00 | 3.798E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.594E+01 |
| U-234 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| U-235 | 1.705E-04 | 5.921E+00 | 0.000E+00 | 0.000E+00 | 3.219E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 9.140E+00 |
| U-238 | 2.847E-03 | 9.889E+01 | 0.000E+00 | 0.000E+00 | 5.375E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.526E+02 |

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
 and water-dependent water, fish, plant, meat, milk pathways

0 Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
 Radon and its Decay Products as pCi/yr at t= 0.000E+00 years

| Radon Pathway | Radionuclides | | | | | | | |
|---------------|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
| Water-ind. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Water-dep. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Total | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |

Water-ind. == Water-independent

Water-dep. == Water-dependent

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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 0.000E+00 years

| Radio-Nuclide | Water Independent Pathways (Inhalation excludes radon) | | | | | | | | | | | |
|---------------|--|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | Ground | | Inhalation | | Plant | | Meat | | Milk | | Soil | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 1.129E-05 | 0.0154 | 5.367E-09 | 0.0000 | 5.875E-07 | 0.0008 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 5.640E-07 | 0.0008 |
| Pa-231 | 2.352E-06 | 0.0032 | 2.578E-09 | 0.0000 | 1.779E-06 | 0.0024 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.001E-07 | 0.0005 |
| Pb-210 | 6.850E-08 | 0.0001 | 7.476E-10 | 0.0000 | 2.593E-05 | 0.0354 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.705E-06 | 0.0037 |
| Ra-226 | 3.883E-04 | 0.5294 | 1.781E-09 | 0.0000 | 4.405E-05 | 0.0600 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.124E-06 | 0.0029 |
| Ra-228 | 7.772E-05 | 0.1060 | 3.017E-10 | 0.0000 | 4.574E-05 | 0.0624 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.490E-06 | 0.0034 |
| Th-228 | 1.207E-04 | 0.1645 | 7.446E-09 | 0.0000 | 4.707E-07 | 0.0005 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.971E-07 | 0.0011 |
| Th-230 | 2.764E-08 | 0.0000 | 3.177E-09 | 0.0000 | 1.844E-07 | 0.0003 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.252E-07 | 0.0006 |
| Th-232 | 6.281E-09 | 0.0000 | 2.613E-09 | 0.0000 | 1.116E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.632E-07 | 0.0004 |
| U-234 | 2.747E-13 | 0.0000 | 4.082E-14 | 0.0000 | 1.188E-11 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.068E-11 | 0.0000 |
| U-235 | 8.256E-07 | 0.0011 | 5.112E-11 | 0.0000 | 1.716E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.561E-08 | 0.0000 |
| U-238 | 2.858E-06 | 0.0039 | 7.902E-10 | 0.0000 | 3.540E-07 | 0.0005 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.351E-07 | 0.0005 |
| Total | 6.041E-04 | 0.8236 | 2.485E-08 | 0.0000 | 1.193E-04 | 0.1626 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.012E-05 | 0.0138 |

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 0.000E+00 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Plant | | Meat | | Milk | | All Pathways** | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|----------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 1.244E-05 | 0.0170 |
| Pa-231 | 0.000E+00 | 0.0000 | 4.533E-06 | 0.0062 |
| Pb-210 | 0.000E+00 | 0.0000 | 2.876E-05 | 0.0392 |
| Ra-226 | 0.000E+00 | 0.0000 | 4.345E-04 | 0.5923 |
| Ra-228 | 0.000E+00 | 0.0000 | 1.260E-04 | 0.1717 |
| Th-228 | 0.000E+00 | 0.0000 | 1.219E-04 | 0.1662 |
| Th-230 | 0.000E+00 | 0.0000 | 6.404E-07 | 0.0009 |
| Th-232 | 0.000E+00 | 0.0000 | 3.837E-07 | 0.0005 |
| U-234 | 0.000E+00 | 0.0000 | 2.287E-11 | 0.0000 |
| U-235 | 0.000E+00 | 0.0000 | 8.584E-07 | 0.0012 |
| U-238 | 0.000E+00 | 0.0000 | 3.548E-06 | 0.0048 |
| Total | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E-00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.336E-04 | 1.0000 |

** Sum of water independent ground, inhalation, plant, meat, milk, soil
 and water dependent water, fish, plant, meat, milk pathways

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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
 Radon and its Decay Products at t= 0.000E+00 years
 Radionuclides

| Radon Pathway | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Water-ind. | 0.000E+00 |
| Water-dep. | 0.000E+00 |
| Total | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 0.000E+00 years

| Radio-Nuclide | Ground | | Inhalation | | Radon | | Plant | | Meat | | Milk | | Soil | |
|---------------|-----------|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 2.545E-06 | 0.0035 | 1.210E-09 | 0.0000 | 0.000E+00 | 0.0000 | 1.315E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.272E-07 | 0.0002 |
| Pa-231 | 1.109E-05 | 0.0151 | 6.735E-09 | 0.0000 | 0.000E+00 | 0.0000 | 2.235E-06 | 0.0030 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.369E-07 | 0.0011 |
| Ra-226 | 3.866E-04 | 0.5270 | 2.518E-09 | 0.0000 | 0.000E+00 | 0.0000 | 6.974E-05 | 0.0951 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.810E-06 | 0.0066 |
| Ra-228 | 4.973E-05 | 0.0678 | 2.001E-09 | 0.0000 | 0.000E+00 | 0.0000 | 1.103E-05 | 0.0150 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.981E-07 | 0.0011 |
| Th-230 | 1.837E-06 | 0.0025 | 3.188E-09 | 0.0000 | 0.000E+00 | 0.0000 | 4.761E-07 | 0.0006 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.441E-07 | 0.0006 |
| Th-232 | 1.487E-04 | 0.2027 | 8.361E-09 | 0.0000 | 0.000E+00 | 0.0000 | 3.529E-05 | 0.0481 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.752E-06 | 0.0038 |
| U-235 | 8.258E-07 | 0.0011 | 5.127E-11 | 0.0000 | 0.000E+00 | 0.0000 | 1.722E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.563E-08 | 0.0000 |
| U-238 | 2.858E-06 | 0.0039 | 7.902E-10 | 0.0000 | 0.000E+00 | 0.0000 | 3.540E-07 | 0.0005 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.351E-07 | 0.0005 |
| Total | 6.041E-04 | 0.8236 | 2.485E-08 | 0.0000 | 0.000E+00 | 0.0000 | 1.193E-04 | 0.1626 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.012E-05 | 0.0138 |

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 0.000E+00 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Radon | | Plant | | Meat | | Milk | | All pathways | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|--------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 2.805E-06 | 0.0038 |
| Pa-231 | 0.000E+00 | 0.0000 | 1.417E-05 | 0.0193 |
| Ra-226 | 0.000E+00 | 0.0000 | 4.611E-04 | 0.6286 |
| Ra-228 | 0.000E+00 | 0.0000 | 6.156E-05 | 0.0839 |
| Th-230 | 0.000E+00 | 0.0000 | 2.761E-06 | 0.0038 |
| Th-232 | 0.000E+00 | 0.0000 | 1.867E-04 | 0.2545 |
| U-235 | 0.000E+00 | 0.0000 | 8.587E-07 | 0.0012 |
| U-238 | 0.000E+00 | 0.0000 | 3.548E-06 | 0.0048 |
| Total | 0.000E+00 | 0.0000 | 7.336E-04 | 1.0000 |

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As pCi/yr at t= 1.000E+00 years

| Radio-Nuclide | Water Independent Pathways (Inhalation w/o radon) | | | | | Water Dependent Pathways | | | | | Total Ingestion* |
|---------------|---|-----------|-----------|-----------|-----------|--------------------------|-----------|-----------|-----------|-----------|------------------|
| | Inhalation | Plant | Meat | Milk | Soil | Water | Fish | Plant | Meat | Milk | |
| Ac-227 | 3.565E-04 | 1.260E+01 | 0.000E+00 | 0.000E+00 | 6.731E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.933E+01 |
| Pa-231 | 1.908E-03 | 2.650E+02 | 0.000E+00 | 0.000E+00 | 3.602E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 3.011E+02 |
| Pb-210 | 1.585E-04 | 2.436E+01 | 0.000E+00 | 0.000E+00 | 2.993E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.735E+01 |
| Ra-226 | 5.180E-03 | 2.878E+03 | 0.000E+00 | 0.000E+00 | 9.779E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.976E+03 |
| Ra-228 | 1.739E-03 | 9.616E+02 | 0.000E+00 | 0.000E+00 | 3.283E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 9.944E+02 |
| Th-228 | 5.238E-04 | 1.905E+01 | 0.000E+00 | 0.000E+00 | 9.889E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.894E+01 |
| Th-230 | 3.717E-03 | 5.165E+01 | 0.000E+00 | 0.000E+00 | 7.017E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.218E+02 |
| Th-232 | 2.012E-03 | 2.796E+01 | 0.000E+00 | 0.000E+00 | 3.798E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.594E+01 |
| U-234 | 8.065E-09 | 2.801E-04 | 0.000E+00 | 0.000E+00 | 1.523E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 4.324E-04 |
| U-235 | 1.704E-04 | 5.917E+00 | 0.000E+00 | 0.000E+00 | 3.217E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 9.134E+00 |
| U-238 | 2.845E-03 | 9.882E+01 | 0.000E+00 | 0.000E+00 | 5.372E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.525E+02 |

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
 and water-dependent water, fish, plant, meat, milk pathways

0 Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
 Radon and its Decay Products as pCi/yr at t= 1.000E+00 years

| Radon Pathway | Radionuclides | | | | | | | |
|---------------|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
| Water-ind. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Water-dep. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Total | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+00 years

| Radio-Nuclide | Water Independent Pathways (Inhalation excludes radon) | | | | | | | | | | | |
|---------------|--|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | Ground | | Inhalation | | Plant | | Meat | | Milk | | Soil | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 1.169E-05 | 0.0158 | 5.559E-09 | 0.0000 | 6.086E-07 | 0.0008 | 0.000E+00 | 0.0000 | 0.0C0E+00 | 0.0000 | 5.842E-07 | 0.0008 |
| Pa-231 | 2.350E-06 | 0.0032 | 2.576E-09 | 0.0000 | 1.777E-06 | 0.0024 | 0.000E+00 | 0.0000 | 0.0C0E+00 | 0.0000 | 3.998E-07 | 0.0005 |
| Pb-210 | 7.237E-08 | 0.0001 | 7.899E-10 | 0.0000 | 2.744E-05 | 0.0371 | 0.000E+00 | 0.0000 | 0.0C0E+00 | 0.0000 | 2.858E-06 | 0.0039 |
| Ra-226 | 3.881E-04 | 0.5245 | 1.780E-09 | 0.0000 | 4.402E-05 | 0.0595 | 0.000E+00 | 0.0000 | 0.0C0E+00 | 0.0000 | 2.122E-06 | 0.0029 |
| Ra-228 | 7.809E-05 | 0.1055 | 3.031E-10 | 0.0000 | 4.596E-05 | 0.0621 | 0.000E+00 | 0.0000 | 0.0C0E+00 | 0.0000 | 2.502E-06 | 0.0034 |
| Th-228 | 1.246E-04 | 0.1684 | 7.690E-09 | 0.0000 | 4.823E-07 | 0.0007 | 0.000E+00 | 0.0000 | 0.0C0E+00 | 0.0000 | 8.233E-07 | 0.0011 |
| Th-230 | 2.764E-08 | 0.0000 | 3.177E-09 | 0.0000 | 1.844E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.0C0E+00 | 0.0000 | 4.252E-07 | 0.0006 |
| Th-232 | 6.281E-09 | 0.0000 | 2.613E-09 | 0.0000 | 1.116E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.0C0E+00 | 0.0000 | 2.632E-07 | 0.0004 |
| U-234 | 2.929E-13 | 0.0000 | 4.352E-14 | 0.0000 | 1.266E-11 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.139E-11 | 0.0000 |
| U-235 | 8.250E-07 | 0.0011 | 5.108E-11 | 0.0000 | 1.715E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.560E-08 | 0.0000 |
| U-238 | 2.856E-06 | 0.0039 | 7.896E-10 | 0.0000 | 3.538E-07 | 0.0005 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.348E-07 | 0.0005 |
| Total | 6.086E-04 | 0.8225 | 2.533E-08 | 0.0000 | 1.210E-04 | 0.1635 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.033E-05 | 0.0140 |

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+00 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Plant | | Meat | | Milk | | All Pathways** | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|----------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 1.289E-05 | 0.0174 |
| Pa-231 | 0.000E+00 | 0.0000 | 4.530E-06 | 0.0061 |
| Pb-210 | 0.000E+00 | 0.0000 | 3.037E-05 | 0.0410 |
| Ra-226 | 0.000E+00 | 0.0000 | 4.342E-04 | 0.5869 |
| Ra-228 | 0.000E+00 | 0.0000 | 1.266E-04 | 0.1710 |
| Th-228 | 0.000E+00 | 0.0000 | 1.259E-04 | 0.1702 |
| Th-230 | 0.000E+00 | 0.0000 | 6.404E-07 | 0.0009 |
| Th-232 | 0.000E+00 | 0.0000 | 3.837E-07 | 0.0005 |
| U-234 | 0.000E+00 | 0.0000 | 2.439E-11 | 0.0000 |
| U-235 | 0.000E+00 | 0.0000 | 8.578E-07 | 0.0012 |
| U-238 | 0.000E+00 | 0.0000 | 3.546E-06 | 0.0048 |
| Total | 0.000E+00 | 0.0000 | 7.399E-04 | 1.0000 |

** Sum of water independent ground, inhalation, plant, meat, milk, soil
 and water dependent water, fish, plant, meat, milk pathways

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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of Radon and its Decay Products at t= 1.000E+00 years

| Radon Pathway | Radionuclides | | | | | | | |
|---------------|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
| Water-ind. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.00CE+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Water-dep. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.00CE+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Total | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.00CE+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

| Radio-Nuclide | Water Independent Pathways (Inhalation excludes radon) | | | | | | | | | | Soil | | |
|---------------|--|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|-----------|--------|
| | Ground | | Inhalation | | Radon | | Plant | | Meat | | Milk | | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | |
| Ac-227 | 2.461E-06 | 0.0033 | 1.170E-09 | 0.0000 | 0.000E+00 | 0.0000 | 1.272E-07 | 0.0002 | 0.00CE+00 | 0.0000 | 0.000E+00 | 0.0000 | |
| Pa-231 | 1.158E-05 | 0.0157 | 6.965E-09 | 0.0000 | 0.000E+00 | 0.0000 | 2.259E-06 | 0.0031 | 0.00CE+00 | 0.0000 | 0.000E+00 | 0.0000 | |
| Ra-226 | 3.862E-04 | 0.5220 | 2.558E-09 | 0.0000 | 0.000E+00 | 0.0000 | 7.115E-05 | 0.0962 | 0.00CE+00 | 0.0000 | 0.000E+00 | 0.0000 | |
| Ra-228 | 4.715E-05 | 0.0637 | 1.963E-09 | 0.0000 | 0.000E+00 | 0.0000 | 9.784E-06 | 0.0132 | 0.00CE+00 | 0.0000 | 0.000E+00 | 0.0000 | |
| Th-230 | 1.957E-06 | 0.0026 | 3.189E-09 | 0.0000 | 0.000E+00 | 0.0000 | 4.980E-07 | 0.0007 | 0.00CE+00 | 0.0000 | 0.000E+00 | 0.0000 | |
| Th-232 | 1.556E-04 | 0.2102 | 8.644E-09 | 0.0000 | 0.000E+00 | 0.0000 | 3.677E-05 | 0.0497 | 0.00CE+00 | 0.0000 | 0.000E+00 | 0.0000 | |
| U-235 | 8.253E-07 | 0.0011 | 5.125E-11 | 0.0000 | 0.000E+00 | 0.0000 | 1.721E-08 | 0.0000 | 0.00CE+00 | 0.0000 | 0.00CE+00 | 0.0000 | |
| U-238 | 2.856E-06 | 0.0039 | 7.897E-10 | 0.0000 | 0.000E+00 | 0.0000 | 3.538E-07 | 0.0005 | 0.00CE+00 | 0.0000 | 0.00CE+00 | 0.0000 | |
| Total | 6.086E-04 | 0.8225 | 2.533E-08 | 0.0000 | 0.000E+00 | 0.0000 | 1.21CE-04 | 0.1635 | 0.000E+00 | 0.0000 | 0.00CE+00 | 0.0000 | |
| | | | | | | | | | | | | 1.033E-05 | 0.0140 |

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

Water Dependent Pathways

| Radio-Nuclide | Water Dependent Pathways | | | | | | | | | | All pathways | | |
|---------------|--------------------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|--------------|-----------|--------|
| | Water | | Fish | | Radon | | Plant | | Meat | | Milk | | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | |
| Ac-227 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.00CE+00 | 0.0000 | 0.000E+00 | 0.0000 | |
| Pa-231 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.00CE+00 | 0.0000 | 0.000E+00 | 0.0000 | |
| Ra-226 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.00CE+00 | 0.0000 | 0.000E+00 | 0.0000 | |
| Ra-228 | 0.00CE+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.00CE+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | |
| Th-230 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.00CE+00 | 0.0000 | 0.000E+00 | 0.0000 | |
| Th-232 | 0.000E+00 | 0.0000 | 0.00CE+00 | 0.0000 | 0.00CE+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.00CE+00 | 0.0000 | |
| U-235 | 0.000E+00 | 0.0000 | 0.00CE+00 | 0.0000 | 0.00CE+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.00CE+00 | 0.0000 | |
| U-238 | 0.00CE+00 | 0.0000 | 0.000E+00 | 0.0000 | |
| Total | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | |
| | | | | | | | | | | | | 7.399E-04 | 1.0000 |

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As pCi/yr at t= 3.000E+00 years

| Radio-Nuclide | Water Independent Pathways (Inhalation w/o radon) | | | | | Water Dependent Pathways | | | | | Total Ingestion* |
|---------------|---|-----------|-----------|-----------|-----------|--------------------------|-----------|-----------|-----------|-----------|------------------|
| | Inhalation | Plant | Meat | Milk | Soil | Water | Fish | Plant | Meat | Milk | |
| Ac-227 | 4.507E-04 | 1.588E+01 | 0.000E+00 | 0.000E+00 | 8.510E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.439E+01 |
| Pa-231 | 1.905E-03 | 2.647E+02 | 0.000E+00 | 0.000E+00 | 3.597E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 3.006E+02 |
| Pb-210 | 4.608E-04 | 6.633E+01 | 0.000E+00 | 0.000E+00 | 8.699E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.503E+01 |
| Ra-226 | 5.173E-03 | 2.874E+03 | 0.000E+00 | 0.000E+00 | 9.767E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.972E+03 |
| Ra-228 | 1.796E-03 | 9.932E+02 | 0.000E+00 | 0.000E+00 | 3.390E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.027E+03 |
| Th-228 | 1.167E-03 | 2.838E+01 | 0.000E+00 | 0.000E+00 | 2.204E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 5.041E+01 |
| Th-230 | 3.717E-03 | 5.165E+01 | 0.000E+00 | 0.000E+00 | 7.017E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.218E+02 |
| Th-232 | 2.012E-03 | 2.796E+01 | 0.000E+00 | 0.000E+00 | 3.798E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.594E+01 |
| U-234 | 2.416E-08 | 8.392E-04 | 0.000E+00 | 0.000E+00 | 4.562E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.295E-03 |
| U-235 | 1.701E-04 | 5.909E+00 | 0.000E+00 | 0.000E+00 | 3.212E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 9.121E+00 |
| U-238 | 2.841E-03 | 9.868E+01 | 0.000E+00 | 0.000E+00 | 5.364E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.523E+02 |

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
 and water-dependent water, fish, plant, meat, milk pathways

0 Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
 Radon and its Decay Products as pCi/yr at t= 3.000E+00 years

| Radon Pathway | Radionuclides | | | | | | | |
|---------------|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
| Water-ind. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Water-dep. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Total | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |

Water-ind. == Water-independent

Water-dep. == Water-dependent

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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 3.000E+00 years

| Radio-Nuclide | Water Independent Pathways (Inhalation excludes radon) | | | | | | | | | | | |
|---------------|--|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | Ground | | Inhalation | | Plant | | Meat | | Milk | | Soil | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 1.246E-05 | 0.0166 | 5.925E-09 | 0.0000 | 6.483E-07 | 0.0009 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.227E-07 | 0.0008 |
| Pa-231 | 2.347E-06 | 0.0031 | 2.572E-09 | 0.0000 | 1.775E-06 | 0.0024 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.992E-07 | 0.0005 |
| Pb-210 | 7.975E-08 | 0.0001 | 8.705E-10 | 0.0000 | 3.022E-05 | 0.0403 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.150E-06 | 0.0042 |
| Ra-226 | 3.876E-04 | 0.5171 | 1.778E-09 | 0.0000 | 4.397E-05 | 0.0587 | 0.000E+00 | 0.0000 | 0.003E+00 | 0.0000 | 2.120E-06 | 0.0028 |
| Ra-228 | 7.871E-05 | 0.1050 | 3.055E-10 | 0.0000 | 4.632E-05 | 0.0618 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.521E-06 | 0.0034 |
| Th-228 | 1.298E-04 | 0.1731 | 8.008E-09 | 0.0000 | 4.967E-07 | 0.0007 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.573E-07 | 0.0011 |
| Th-230 | 2.764E-08 | 0.0000 | 3.177E-09 | 0.0000 | 1.844E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.252E-07 | 0.0006 |
| Th-232 | 6.281E-09 | 0.0000 | 2.613E-09 | 0.0000 | 1.116E-07 | 0.0001 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.632E-07 | 0.0004 |
| U-234 | 3.292E-13 | 0.0000 | 4.890E-14 | 0.0000 | 1.423E-11 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.280E-11 | 0.0000 |
| U-235 | 8.238E-07 | 0.0011 | 5.101E-11 | 0.0000 | 1.712E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.557E-08 | 0.0000 |
| U-238 | 2.852E-06 | 0.0038 | 7.885E-10 | 0.0000 | 3.533E-07 | 0.0005 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.344E-07 | 0.0004 |
| Total | 6.147E-04 | 0.8201 | 2.609E-08 | 0.0000 | 1.241E-04 | 0.1656 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.071E-05 | 0.0143 |

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 3.000E+00 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Plant | | Meat | | Milk | | All Pathways** | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|----------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+30 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.374E-05 | 0.0183 |
| Pa-231 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+30 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.523E-06 | 0.0060 |
| Pb-210 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+30 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.345E-05 | 0.0446 |
| Ra-226 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+30 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.337E-04 | 0.5786 |
| Ra-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+30 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.275E-04 | 0.1702 |
| Th-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+30 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.311E-04 | 0.1750 |
| Th-230 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+30 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.404E-07 | 0.0009 |
| Th-232 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+30 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.837E-07 | 0.0005 |
| U-234 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+30 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.740E-11 | 0.0000 |
| U-235 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+30 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.566E-07 | 0.0011 |
| U-238 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+30 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.541E-06 | 0.0047 |
| Total | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+30 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.495E-04 | 1.0000 |

** Sum of water independent ground, inhalation, plant, meat, milk, soil
 and water dependent water, fish, plant, meat, milk pathways

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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
 Radon and its Decay Products at t= 3.000E+00 years
 Radionuclides

| Radon Pathway | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Water-ind. | 0.000E+00 |
| Water-dep. | 0.000E+00 |
| Total | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 3.000E+00 years

| Radio-Nuclide | Ground | | Inhalation | | Radon | | Plant | | Meat | | Milk | | Soil | |
|---------------|-----------|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 2.301E-06 | 0.0031 | 1.094E-09 | 0.0000 | 0.000E+00 | 0.0000 | 1.189E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.150E-07 | 0.0002 |
| Pa-231 | 1.251E-05 | 0.0167 | 7.403E-09 | 0.0000 | 0.000E+00 | 0.0000 | 2.304E-06 | 0.0031 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.069E-07 | 0.0012 |
| Ra-226 | 3.855E-04 | 0.5144 | 2.635E-09 | 0.0000 | 0.000E+00 | 0.0000 | 7.382E-05 | 0.0985 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 5.246E-06 | 0.0070 |
| Ra-228 | 4.043E-05 | 0.0539 | 1.752E-09 | 0.0000 | 0.000E+00 | 0.0000 | 7.689E-06 | 0.0103 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 5.937E-07 | 0.0008 |
| Th-230 | 2.197E-06 | 0.0029 | 3.190E-09 | 0.0000 | 0.000E+00 | 0.0000 | 5.430E-07 | 0.0007 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.488E-07 | 0.0006 |
| Th-232 | 1.680E-04 | 0.2242 | 9.175E-09 | 0.0000 | 0.000E+00 | 0.0000 | 3.924E-05 | 0.0524 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.048E-06 | 0.0041 |
| U-235 | 8.241E-07 | 0.0011 | 5.120E-11 | 0.0000 | 0.000E+00 | 0.0000 | 1.720E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.560E-08 | 0.0000 |
| U-238 | 2.852E-06 | 0.0038 | 7.885E-10 | 0.0000 | 0.000E+00 | 0.0000 | 3.533E-07 | 0.0005 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.344E-07 | 0.0004 |
| Total | 6.147E-04 | 0.8201 | 2.609E-08 | 0.0000 | 0.000E+00 | 0.0000 | 1.241E-04 | 0.1656 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.071E-05 | 0.0143 |

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 3.000E+00 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Radon | | Plant | | Meat | | Milk | | All pathways | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|--------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.000C | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.536E-06 | 0.0034 |
| Pa-231 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.000C | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.573E-05 | 0.0210 |
| Ra-226 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.000C | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.646E-04 | 0.6199 |
| Ra-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.000C | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.871E-05 | 0.0650 |
| Th-230 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.000C | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.192E-06 | 0.0043 |
| Th-232 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.000C | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.103E-04 | 0.2807 |
| U-235 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.000C | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.570E-07 | 0.0011 |
| U-238 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.000C | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.541E-06 | 0.0047 |
| Total | 0.000E+00 | 0.0000 | 7.495E-04 | 1.0000 |

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As pCi/yr at t= 1.000E+01 years

| Radio-Nuclide | Water Independent Pathways (Inhalation w/o radon) | | | | | Water Dependent Pathways | | | | | Total Ingestion* |
|---------------|---|-----------|-----------|-----------|-----------|--------------------------|-----------|-----------|-----------|-----------|------------------|
| | Inhalation | Plant | Meat | Milk | Soil | Water | Fish | Plant | Meat | Milk | |
| Ac-227 | 7.336E-04 | 2.570E+01 | 0.000E+00 | 0.000E+00 | 1.385E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 3.955E+01 |
| Pa-231 | 1.895E-03 | 2.633E+02 | 0.000E+00 | 0.000E+00 | 3.579E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.991E+02 |
| Pb-210 | 1.378E-03 | 1.937E+02 | 0.000E+00 | 0.000E+00 | 2.601E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.197E+02 |
| Ra-226 | 5.150E-03 | 2.861E+03 | 0.000E+00 | 0.000E+00 | 9.724E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.959E+03 |
| Ra-228 | 1.914E-03 | 1.059E+03 | 0.000E+00 | 0.000E+00 | 3.614E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.095E+03 |
| Th-228 | 1.828E-03 | 3.837E+01 | 0.000E+00 | 0.000E+00 | 3.452E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.289E+01 |
| Th-230 | 3.716E-03 | 5.165E+01 | 0.000E+00 | 0.000E+00 | 7.016E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.218E+02 |
| Th-232 | 2.012E-03 | 2.796E+01 | 0.000E+00 | 0.000E+00 | 3.798E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.594E+01 |
| U-234 | 8.013E-08 | 2.783E-03 | 0.000E+00 | 0.000E+00 | 1.513E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 4.296E-03 |
| U-235 | 1.693E-04 | 5.879E+00 | 0.000E+00 | 0.000E+00 | 3.196E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 9.075E+00 |
| U-238 | 2.827E-03 | 9.819E+01 | 0.000E+00 | 0.000E+00 | 5.337E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.516E+02 |

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
 and water-dependent water, fish, plant, meat, milk pathways

0 Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
 Radon and its Decay Products as pCi/yr at t= 1.000E+01 years

| Radon Pathway | Radionuclides | | | | | | | |
|---------------|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
| Water-ind. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Water-dep. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Total | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+01 years

| Radio-Nuclide | Ground | | Inhalation | | Plant | | Meat | | Milk | | Soil | |
|---------------|-----------|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 1.476E-05 | 0.0192 | 7.019E-09 | 0.0000 | 7.672E-07 | 0.0010 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.376E-07 | 0.0010 |
| Pa-231 | 2.334E-06 | 0.0030 | 2.559E-09 | 0.0000 | 1.766E-06 | 0.0023 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.971E-07 | 0.0005 |
| Pb-210 | 1.021E-07 | 0.0001 | 1.114E-09 | 0.0000 | 3.862E-05 | 0.0503 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.033E-06 | 0.0053 |
| Ra-226 | 3.859E-04 | 0.5025 | 1.770E-09 | 0.0000 | 4.377E-05 | 0.0570 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.110E-06 | 0.0027 |
| Ra-228 | 7.999E-05 | 0.1042 | 3.105E-10 | 0.0000 | 4.708E-05 | 0.0613 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.562E-06 | 0.0033 |
| Th-228 | 1.362E-04 | 0.1773 | 8.403E-09 | 0.0000 | 5.157E-07 | 0.0007 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.995E-07 | 0.0012 |
| Th-230 | 2.764E-08 | 0.0000 | 3.177E-09 | 0.0000 | 1.844E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.251E-07 | 0.0006 |
| Th-232 | 6.281E-09 | 0.0000 | 2.613E-09 | 0.0000 | 1.116E-07 | 0.0001 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.632E-07 | 0.0003 |
| U-234 | 4.553E-13 | 0.0000 | 6.764E-14 | 0.0000 | 1.968E-11 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.770E-11 | 0.0000 |
| U-235 | 8.197E-07 | 0.0011 | 5.075E-11 | 0.0000 | 1.704E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.550E-08 | 0.0000 |
| U-238 | 2.838E-06 | 0.0037 | 7.846E-10 | 0.0000 | 3.515E-07 | 0.0005 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.327E-07 | 0.0004 |
| Total | 6.229E-04 | 0.8112 | 2.780E-08 | 0.0000 | 1.332E-04 | 0.1734 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.178E-05 | 0.0153 |

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+01 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Plant | | Meat | | Milk | | All Pathways** | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|----------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 1.627E-05 | 0.0212 |
| Pa-231 | 0.000E+00 | 0.0000 | 4.500E-06 | 0.0059 |
| Pb-210 | 0.000E+00 | 0.0000 | 4.276E-05 | 0.0557 |
| Ra-226 | 0.000E+00 | 0.0000 | 4.318E-04 | 0.5623 |
| Ra-228 | 0.000E+00 | 0.0000 | 1.296E-04 | 0.1688 |
| Th-228 | 0.000E+00 | 0.0000 | 1.376E-04 | 0.1792 |
| Th-230 | 0.000E+00 | 0.0000 | 6.403E-07 | 0.0008 |
| Th-232 | 0.000E+00 | 0.0000 | 3.837E-07 | 0.0005 |
| U-234 | 0.000E+00 | 0.0000 | 3.790E-11 | 0.0000 |
| U-235 | 0.000E+00 | 0.0000 | 8.523E-07 | 0.0011 |
| U-238 | 0.000E+00 | 0.0000 | 3.523E-06 | 0.0046 |
| Total | 0.000E+00 | 0.0000 | 7.679E-04 | 1.0000 |

** Sum of water independent ground, inhalation, plant, meat, milk, soil
 and water dependent water, fish, plant, meat, milk pathways

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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
 Radon and its Decay Products at t= 1.000E+01 years
 Radonuclides

| Radon Pathway | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Water-ind. | 0.000E+00 |
| Water-dep. | 0.000E+00 |
| Total | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+01 years

| Radio-Nuclide | Ground | | Inhalation | | Radon | | Plant | | Meat | | Milk | | Soil | |
|---------------|-----------|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 1.819E-06 | 0.0024 | 8.647E-10 | 0.0000 | 0.000E+00 | 0.0000 | 9.399E-08 | 0.0001 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.087E-08 | 0.0001 |
| Pa-231 | 1.528E-05 | 0.0199 | 8.713E-09 | 0.0000 | 0.000E+00 | 0.0000 | 2.439E-06 | 0.0032 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.044E-06 | 0.0014 |
| Ra-226 | 3.830E-04 | 0.4987 | 2.865E-09 | 0.0000 | 0.000E+00 | 0.0000 | 8.186E-05 | 0.1066 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.107E-06 | 0.0080 |
| Ra-228 | 1.925E-05 | 0.0251 | 8.695E-10 | 0.0000 | 0.000E+00 | 0.0000 | 3.300E-06 | 0.0043 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.672E-07 | 0.0003 |
| Th-230 | 3.033E-06 | 0.0039 | 3.196E-09 | 0.0000 | 0.000E+00 | 0.0000 | 7.126E-07 | 0.0009 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.611E-07 | 0.0006 |
| Th-232 | 1.969E-04 | 0.2564 | 1.046E-08 | 0.0000 | 0.000E+00 | 0.0000 | 4.441E-05 | 0.0578 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.458E-06 | 0.0045 |
| U-235 | 8.202E-07 | 0.0011 | 5.105E-11 | 0.0000 | 0.000E+00 | 0.0000 | 1.714E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.553E-08 | 0.0000 |
| U-238 | 2.838E-06 | 0.0037 | 7.846E-10 | 0.0000 | 0.000E+00 | 0.0000 | 3.515E-07 | 0.0005 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.327E-07 | 0.0004 |
| Total | 6.229E-04 | 0.8112 | 2.780E-08 | 0.0000 | 0.000E+00 | 0.0000 | 1.332E-04 | 0.1734 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.178E-05 | 0.0153 |

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+01 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Radon | | Plant | | Meat | | Milk | | All pathways | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|--------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 2.004E-06 | 0.0026 |
| Pa-231 | 0.000E+00 | 0.0000 | 1.877E-05 | 0.0244 |
| Ra-226 | 0.000E+00 | 0.0000 | 4.710E-04 | 0.6133 |
| Ra-228 | 0.000E+00 | 0.0000 | 2.282E-05 | 0.0297 |
| Th-230 | 0.000E+00 | 0.0000 | 4.209E-06 | 0.0055 |
| Th-232 | 0.000E+00 | 0.0000 | 2.448E-04 | 0.3188 |
| U-235 | 0.000E+00 | 0.0000 | 8.529E-07 | 0.0011 |
| U-238 | 0.000E+00 | 0.0000 | 3.523E-06 | 0.0046 |
| Total | 0.000E+00 | 0.0000 | 7.679E-04 | 1.0000 |

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

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T_{1/2} Limit = 180 days

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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 7.000E+01 years

| Radio-Nuclide | Water Independent Pathways (Inhalation w/o radon) | | | | | Water Dependent Pathways | | | | | Total Ingestion* |
|---------------|---|-----------|-----------|-----------|-----------|--------------------------|-----------|-----------|-----------|-----------|---------------------|
| | Inhalation | Plant | Meat | Milk | Soil | Water | Fish | Plant | Meat | Milk | |
| Ac-227 | 1.610E-03 | 5.613E+01 | 0.000E+00 | 0.000E+00 | 3.039E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 8.652E+01 |
| Pa-231 | 1.814E-03 | 2.520E+02 | 0.000E+00 | 0.000E+00 | 3.425E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.862E+02 |
| Pb-210 | 4.424E-03 | 6.168E+02 | 0.000E+00 | 0.000E+00 | 8.353E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.003E+02 |
| Ra-226 | 4.960E-03 | 2.756E+03 | 0.000E+00 | 0.000E+00 | 9.365E-01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.850E+03 |
| Ra-228 | 2.003E-03 | 1.108E+03 | 0.000E+00 | 0.000E+00 | 3.782E-01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.146E+03 |
| Th-228 | 2.003E-03 | 4.141E+01 | 0.000E+00 | 0.000E+00 | 3.782E-01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.923E+01 |
| Th-230 | 3.714E-03 | 5.162E+01 | 0.000E+00 | 0.000E+00 | 7.012E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.217E+02 |
| Th-232 | 2.012E-03 | 2.796E+01 | 0.000E+00 | 0.000E+00 | 3.798E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.594E+01 |
| U-234 | 5.374E-07 | 1.866E-02 | 0.000E+00 | 0.000E+00 | 1.015E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.881E-02 |
| U-235 | 1.622E-04 | 5.633E+00 | 0.000E+00 | 0.000E+00 | 3.062E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 8.694E+00 |
| U-238 | 2.708E-03 | 9.407E+01 | 0.000E+00 | 0.000E+00 | 5.113E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.452E+02 |

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0 Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 7.000E+01 years

| Radon Pathway | Radionuclides | | | | | | | |
|---------------|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
| Water-ind. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Water-dep. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Total | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |

Water-ind. == Water-independent

Water-dep. == Water-dependent

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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 7.000E+01 years

| Radio-Nuclide | Water Independent Pathways (Inhalation excludes radon) | | | | | | | | | | | |
|---------------|--|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | Ground | | Inhalation | | Plant | | Meat | | Milk | | Soil | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 2.166E-05 | 0.0273 | 1.030E-08 | 0.0000 | 1.123E-06 | 0.0014 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.082E-06 | 0.0014 |
| Pa-231 | 2.234E-06 | 0.0028 | 2.449E-09 | 0.0000 | 1.690E-06 | 0.0021 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.800E-07 | 0.0005 |
| Pb-210 | 1.749E-07 | 0.0002 | 1.909E-09 | 0.0000 | 6.597E-05 | 0.0831 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.907E-06 | 0.0087 |
| Ra-226 | 3.717E-04 | 0.4682 | 1.705E-09 | 0.0000 | 4.217E-05 | 0.0531 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.033E-06 | 0.0026 |
| Ra-228 | 8.095E-05 | 0.1020 | 3.142E-10 | 0.0000 | 4.765E-05 | 0.0600 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.593E-06 | 0.0033 |
| Th-228 | 1.389E-04 | 0.1750 | 8.572E-09 | 0.0000 | 5.247E-07 | 0.0007 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.176E-07 | 0.0012 |
| Th-230 | 2.763E-08 | 0.0000 | 3.175E-09 | 0.0000 | 1.843E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.249E-07 | 0.0005 |
| Th-232 | 6.281E-09 | 0.0000 | 2.613E-09 | 0.0000 | 1.116E-07 | 0.0001 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.632E-07 | 0.0003 |
| U-234 | 1.485E-12 | 0.0000 | 2.206E-13 | 0.0000 | 6.420E-11 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 5.773E-11 | 0.0000 |
| U-235 | 7.853E-07 | 0.0010 | 4.862E-11 | 0.0000 | 1.632E-C8 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.485E-08 | 0.0000 |
| U-238 | 2.719E-06 | 0.0034 | 7.516E-10 | 0.0000 | 3.367E-C7 | 0.0004 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.187E-07 | 0.0004 |
| Total | 6.192E-04 | 0.7799 | 3.183E-08 | 0.0000 | 1.598E-C4 | 0.2012 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.493E-05 | 0.0188 |

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 7.000E+01 years

| Radio-Nuclide | Water Dependent Pathways | | | | | | | | | | | |
|---------------|--------------------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|----------------|--------|
| | Water | | Fish | | Plant | | Meat | | Milk | | All Pathways** | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.C000 | 0.000E+C0 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.387E-05 | 0.0301 |
| Pa-231 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.C000 | 0.000E+C0 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.306E-06 | 0.0054 |
| Pb-210 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.C000 | 0.000E+C0 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.305E-05 | 0.0920 |
| Ra-226 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.C000 | 0.000E+C0 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.159E-04 | 0.5239 |
| Ra-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.C000 | 0.000E+C0 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.312E-04 | 0.1652 |
| Th-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.C000 | 0.000E+C0 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.403E-04 | 0.1768 |
| Th-230 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.G000 | 0.000E+C0 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.400E-07 | 0.0008 |
| Th-232 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.C000 | 0.000E+C0 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.837E-07 | 0.0005 |
| U-234 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.C000 | 0.000E+C0 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.236E-10 | 0.0000 |
| U-235 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.C000 | 0.000E+C0 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.165E-07 | 0.0010 |
| U-238 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.C000 | 0.000E+C0 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.375E-06 | 0.0043 |
| Total | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+C0 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.939E-04 | 1.0000 |

** Sum of water independent ground, inhalation, plant, meat, milk, soil
 and water dependent water, fish, plant, meat, milk pathways

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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of Radon and its Decay Products at t= 7.000E+01 years

| Radon Pathway | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Water-ind. | 0.000E+00 |
| Water-dep. | 0.000E+00 |
| Total | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p) and Fraction of Total Risk at t= 7.000E+01 years

| Radio-Nuclide | Ground | | Inhalation | | Radon | | Plant | | Meat | | Milk | | Soil | |
|---------------|-----------|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 2.421E-07 | 0.0003 | 1.151E-10 | 0.0000 | 0.000E+00 | 0.0000 | 1.251E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.210E-08 | 0.0000 |
| Pa-231 | 2.365E-05 | 0.0298 | 1.263E-08 | 0.0000 | 0.000E+00 | 0.0000 | 2.800E-06 | 0.0035 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.450E-06 | 0.0018 |
| Ra-226 | 3.620E-04 | 0.4559 | 3.533E-09 | 0.0000 | 0.000E+00 | 0.0000 | 1.058E-04 | 0.1332 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.757E-06 | 0.0110 |
| Ra-228 | 1.380E-08 | 0.0000 | 6.284E-13 | 0.0000 | 0.000E+00 | 0.0000 | 2.313E-09 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.892E-10 | 0.0000 |
| Th-230 | 9.970E-06 | 0.0126 | 3.256E-09 | 0.0000 | 0.000E+00 | 0.0000 | 2.544E-06 | 0.0032 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.081E-07 | 0.0008 |
| Th-232 | 2.198E-04 | 0.2769 | 1.150E-08 | 0.0000 | 0.000E+00 | 0.0000 | 4.828E-05 | 0.0608 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.774E-06 | 0.0048 |
| U-235 | 7.881E-07 | 0.0010 | 5.018E-11 | 0.0000 | 0.000E+00 | 0.0000 | 1.672E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.503E-08 | 0.0000 |
| U-238 | 2.719E-06 | 0.0034 | 7.518E-10 | 0.0000 | 0.000E+00 | 0.0000 | 3.368E-07 | 0.0004 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.188E-07 | 0.0004 |
| Total | 6.192E-04 | 0.7799 | 3.183E-08 | 0.0000 | 0.000E+00 | 0.0000 | 1.598E-04 | 0.2012 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.493E-05 | 0.0188 |

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p) and Fraction of Total Risk at t= 7.000E+01 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Radon | | Plant | | Meat | | Milk | | All pathways | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|--------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 2.669E-07 | 0.0003 |
| Pa-231 | 0.000E+00 | 0.0000 | 2.791E-05 | 0.0352 |
| Ra-226 | 0.000E+00 | 0.0000 | 4.765E-04 | 0.6002 |
| Ra-228 | 0.000E+00 | 0.0000 | 1.630E-08 | 0.0000 |
| Th-230 | 0.000E+00 | 0.0000 | 1.313E-05 | 0.0165 |
| Th-232 | 0.000E+00 | 0.0000 | 2.719E-04 | 0.3425 |
| U-235 | 0.000E+00 | 0.0000 | 8.199E-07 | 0.0010 |
| U-238 | 0.000E+00 | 0.0000 | 3.375E-06 | 0.0043 |
| Total | 0.000E+00 | 0.0000 | 7.939E-04 | 1.0000 |

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As pCi/yr at t= 1.000E+02 years

| Radio-Nuclide | Water Independent Pathways (Inhalation w/o radon) | | | | | Water Dependent Pathways | | | | | Total Ingestion* |
|---------------|---|-----------|-----------|-----------|-----------|--------------------------|-----------|-----------|-----------|-----------|------------------|
| | Inhalation | Plant | Meat | Milk | Soil | Water | Fish | Plant | Meat | Milk | |
| Ac-227 | 1.665E-03 | 5.803E+01 | 0.000E+00 | 0.000E+00 | 3.143E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 8.946E+01 |
| Pa-231 | 1.774E-03 | 2.465E+02 | 0.000E+00 | 0.000E+00 | 3.350E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.800E+02 |
| Pb-210 | 4.685E-03 | 6.530E+02 | 0.000E+00 | 0.000E+00 | 8.846E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.415E+02 |
| Ra-226 | 4.869E-03 | 2.705E+03 | 0.000E+00 | 0.000E+00 | 9.193E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.797E+03 |
| Ra-228 | 2.003E-03 | 1.108E+03 | 0.000E+00 | 0.000E+00 | 3.782E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.146E+03 |
| Th-228 | 2.003E-03 | 4.141E+01 | 0.000E+00 | 0.000E+00 | 3.782E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.923E+01 |
| Th-230 | 3.713E-03 | 5.161E+01 | 0.000E+00 | 0.000E+00 | 7.010E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.217E+02 |
| Th-232 | 2.012E-03 | 2.796E+01 | 0.000E+00 | 0.000E+00 | 3.798E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.594E+01 |
| U-234 | 7.513E-07 | 2.610E-02 | 0.000E+00 | 0.000E+00 | 1.419E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 4.028E-02 |
| U-235 | 1.587E-04 | 5.513E+00 | 0.000E+00 | 0.000E+00 | 2.997E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 8.510E+00 |
| U-238 | 2.651E-03 | 9.207E+01 | 0.000E+00 | 0.000E+00 | 5.005E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.421E+02 |

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
 and water-dependent water, fish, plant, meat, milk pathways

0 Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
 Radon and its Decay Products as pCi/yr at t= 1.000E+02 years

| Radon Pathway | Radionuclides | | | | | | | |
|---------------|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
| Water-ind. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Water-dep. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Total | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+02 years

| Radio-Nuclide | Water Independent Pathways (Inhalation excludes radon) | | | | | | | | | | | |
|---------------|--|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | Ground | | Inhalation | | Plant | | Meat | | Milk | | Soil | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 2.193E-05 | 0.0278 | 1.043E-08 | 0.0000 | 1.137E-06 | 0.0014 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.096E-06 | 0.0014 |
| Pa-231 | 2.185E-06 | 0.0028 | 2.395E-09 | 0.0000 | 1.653E-06 | 0.0021 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.718E-07 | 0.0005 |
| Pb-210 | 1.801E-07 | 0.0002 | 1.966E-09 | 0.0000 | 6.794E-05 | 0.0861 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.115E-06 | 0.0090 |
| Ra-226 | 3.649E-04 | 0.4628 | 1.674E-09 | 0.0000 | 4.140E-05 | 0.0525 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.996E-06 | 0.0025 |
| Ra-228 | 8.095E-05 | 0.1026 | 3.142E-10 | 0.0000 | 4.765E-05 | 0.0604 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.593E-06 | 0.0033 |
| Th-228 | 1.389E-04 | 0.1761 | 8.572E-09 | 0.0000 | 5.247E-07 | 0.0007 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.176E-07 | 0.0012 |
| Th-230 | 2.762E-08 | 0.0000 | 3.174E-09 | 0.0000 | 1.842E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.248E-07 | 0.0005 |
| Th-232 | 6.281E-09 | 0.0000 | 2.613E-09 | 0.0000 | 1.116E-07 | 0.0001 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.632E-07 | 0.0003 |
| U-234 | 1.967E-12 | 0.0000 | 2.922E-13 | 0.0000 | 8.502E-11 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.646E-11 | 0.0000 |
| U-235 | 7.686E-07 | 0.0010 | 4.759E-11 | 0.0000 | 1.598E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.453E-08 | 0.0000 |
| U-238 | 2.661E-06 | 0.0034 | 7.357E-10 | 0.0000 | 3.296E-07 | 0.0004 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.120E-07 | 0.0004 |
| Total | 6.126E-04 | 0.7767 | 3.192E-08 | 0.0000 | 1.609E-04 | 0.2041 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.510E-05 | 0.0192 |

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+02 years

Water Dependent Pathways

| Radio-Nuclide | Water Dependent Pathways | | | | | | | | | | | |
|---------------|--------------------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|----------------|--------|
| | Water | | Fish | | Plant | | Meat | | Milk | | All Pathways** | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.417E-05 | 0.0307 |
| Pa-231 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.212E-06 | 0.0053 |
| Pb-210 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.523E-05 | 0.0954 |
| Ra-226 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.083E-04 | 0.5178 |
| Ra-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.312E-04 | 0.1664 |
| Th-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.403E-04 | 0.1780 |
| Th-230 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.398E-07 | 0.0008 |
| Th-232 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.836E-07 | 0.0005 |
| U-234 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.637E-10 | 0.0000 |
| U-235 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.992E-07 | 0.0010 |
| U-238 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.303E-06 | 0.0042 |
| Total | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.886E-04 | 1.0000 |

** Sum of water independent ground, inhalation, plant, meat, milk, soil
 and water dependent water, fish, plant, meat, milk pathways

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Excess Cancer Risks CNRS9(irr,i,t) and CNRS9W(irn,i,t) for Inhalation of
 Radon and its Decay Products at t= 1.000E+02 years
 Radionuclides

| Radon Pathway | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Water-ind. | 0.000E+00 |
| Water-dep. | 0.000E+00 |
| Total | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

0 Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+02 years

| Radio-Nuclide | Ground | | Inhalation | | Fadon | | Plant | | Meat | | Milk | | Soil | |
|---------------|-----------|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 8.835E-08 | 0.0001 | 4.200E-11 | 0.0000 | 0.000E+00 | 0.0000 | 4.566E-09 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.414E-09 | 0.0000 |
| Pa-231 | 2.402E-05 | 0.0305 | 1.278E-08 | 0.0000 | 0.000E+00 | 0.0000 | 2.785E-06 | 0.0035 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.463E-06 | 0.0019 |
| Ra-226 | 3.519E-04 | 0.4462 | 3.526E-09 | 0.0000 | 0.000E+00 | 0.0000 | 1.060E-04 | 0.1344 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.845E-06 | 0.0112 |
| Ra-228 | 3.652E-10 | 0.0000 | 1.663E-14 | 0.0000 | 0.000E+00 | 0.0000 | 6.123E-11 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 5.009E-12 | 0.0000 |
| Th-230 | 1.329E-05 | 0.0169 | 3.288E-09 | 0.0000 | 0.000E+00 | 0.0000 | 3.532E-06 | 0.0045 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.902E-07 | 0.0009 |
| Th-232 | 2.199E-04 | 0.2788 | 1.150E-08 | 0.0000 | 0.000E+00 | 0.0000 | 4.828E-05 | 0.0612 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.774E-06 | 0.0048 |
| U-235 | 7.727E-07 | 0.0010 | 4.983E-11 | 0.0000 | 0.000E+00 | 0.0000 | 1.652E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.479E-08 | 0.0000 |
| U-238 | 2.661E-06 | 0.0034 | 7.360E-10 | 0.0000 | 0.000E+00 | 0.0000 | 3.297E-07 | 0.0004 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.120E-07 | 0.0004 |
| Total | 6.126E-04 | 0.7767 | 3.192E-08 | 0.0000 | 0.000E+00 | 0.0000 | 1.609E-04 | 0.2041 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.510E-05 | 0.0192 |

0 Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+02 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Radon | | Plant | | Meat | | Milk | | All pathways | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|--------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 9.737E-08 | 0.0001 |
| Pa-231 | 0.000E+00 | 0.0000 | 2.828E-05 | 0.0359 |
| Ra-226 | 0.000E+00 | 0.0000 | 4.667E-04 | 0.5918 |
| Ra-228 | 0.000E+00 | 0.0000 | 4.314E-10 | 0.0000 |
| Th-230 | 0.000E+00 | 0.0000 | 1.752E-05 | 0.0222 |
| Th-232 | 0.000E+00 | 0.0000 | 2.719E-04 | 0.3448 |
| U-235 | 0.000E+00 | 0.0000 | 8.041E-07 | 0.0010 |
| U-238 | 0.000E+00 | 0.0000 | 3.304E-06 | 0.0042 |
| Total | 0.000E+00 | 0.0000 | 7.886E-04 | 1.0000 |

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As pCi/yr at t= 3.000E+02 years

| Radio-Nuclide | Water Independent Pathways (Inhalation w/o radon) | | | | | Water Dependent Pathways | | | | | Total Ingestion* |
|---------------|---|-----------|-----------|-----------|-----------|--------------------------|-----------|-----------|-----------|-----------|------------------|
| | Inhalation | Plant | Meat | Milk | Soil | Water | Fish | Plant | Meat | Milk | |
| Ac-227 | 1.484E-03 | 5.171E+01 | 0.000E+00 | 0.000E+00 | 2.801E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.972E+01 |
| Pa-231 | 1.532E-03 | 2.128E+02 | 0.000E+00 | 0.000E+00 | 2.893E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.417E+02 |
| Pb-210 | 4.355E-03 | 6.068E+02 | 0.000E+00 | 0.000E+00 | 8.222E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.890E+02 |
| Ra-226 | 4.324E-03 | 2.402E+03 | 0.000E+00 | 0.000E+00 | 8.164E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.484E+03 |
| Ra-228 | 2.003E-03 | 1.108E+03 | 0.000E+00 | 0.000E+00 | 3.782E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.146E+03 |
| Th-228 | 2.003E-03 | 4.140E+01 | 0.000E+00 | 0.000E+00 | 3.782E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.922E+01 |
| Th-230 | 3.706E-03 | 5.151E+01 | 0.000E+00 | 0.000E+00 | 6.997E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.215E+02 |
| Th-232 | 2.011E-03 | 2.796E+01 | 0.000E+00 | 0.000E+00 | 3.798E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.593E+01 |
| U-234 | 1.953E-06 | 6.784E-02 | 0.000E+00 | 0.000E+00 | 3.688E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.047E-01 |
| U-235 | 1.376E-04 | 4.779E+00 | 0.000E+00 | 0.000E+00 | 2.598E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.377E+00 |
| U-238 | 2.298E-03 | 7.981E+01 | 0.000E+00 | 0.000E+00 | 4.338E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.232E+02 |

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
 and water-dependent water, fish, plant, meat, milk pathways

0 Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
 Radon and its Decay Products as pCi/yr at t= 3.000E+02 years

| Radon Pathway | Radionuclides | | | | | | | |
|---------------|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
| Water-ind. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Water-dep. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Total | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 3.000E+02 years

| Radio-Nuclide | Water Independent Pathways (Inhalation excludes radon) | | | | | | | | | | | |
|---------------|--|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | Ground | | Inhalation | | Plant | | Meat | | Milk | | Soil | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 1.932E-05 | 0.0264 | 9.186E-09 | 0.0000 | 1.002E-06 | 0.0014 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.653E-07 | 0.0013 |
| Pa-231 | 1.887E-06 | 0.0026 | 2.068E-09 | 0.0000 | 1.427E-06 | 0.0019 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.210E-07 | 0.0004 |
| Pb-210 | 1.648E-07 | 0.0002 | 1.799E-09 | 0.0000 | 6.214E-05 | 0.0848 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.508E-06 | 0.0089 |
| Ra-226 | 3.243E-04 | 0.4426 | 1.487E-09 | 0.0000 | 3.678E-05 | 0.0502 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.773E-06 | 0.0024 |
| Ra-228 | 8.094E-05 | 0.1105 | 3.142E-10 | 0.0000 | 4.764E-05 | 0.0650 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.593E-06 | 0.0035 |
| Th-228 | 1.389E-04 | 0.1896 | 8.571E-09 | 0.0000 | 5.246E-07 | 0.0007 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.175E-07 | 0.0013 |
| Th-230 | 2.757E-08 | 0.0000 | 3.168E-09 | 0.0000 | 1.839E-07 | 0.0003 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.240E-07 | 0.0006 |
| Th-232 | 6.280E-09 | 0.0000 | 2.613E-09 | 0.0000 | 1.115E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.632E-07 | 0.0004 |
| U-234 | 4.670E-12 | 0.0000 | 6.938E-13 | 0.0000 | 2.019E-10 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.816E-10 | 0.0000 |
| U-235 | 6.663E-07 | 0.0009 | 4.125E-11 | 0.0000 | 1.385E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.260E-08 | 0.0000 |
| U-238 | 2.307E-06 | 0.0031 | 6.377E-10 | 0.0000 | 2.857E-07 | 0.0004 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.704E-07 | 0.0004 |
| Total | 5.685E-04 | 0.7759 | 2.989E-08 | 0.0000 | 1.501E-04 | 0.2049 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.405E-05 | 0.0192 |

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 3.000E+02 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Plant | | Meat | | Milk | | All Pathways** | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|----------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 2.130E-05 | 0.0291 |
| Pa-231 | 0.000E+00 | 0.0000 | 3.637E-06 | 0.0050 |
| Pb-210 | 0.000E+00 | 0.0000 | 6.882E-05 | 0.0939 |
| Ra-226 | 0.000E+00 | 0.0000 | 3.628E-04 | 0.4952 |
| Ra-228 | 0.000E+00 | 0.0000 | 1.312E-04 | 0.1790 |
| Th-228 | 0.000E+00 | 0.0000 | 1.403E-04 | 0.1915 |
| Th-230 | 0.000E+00 | 0.0000 | 6.385E-07 | 0.0009 |
| Th-232 | 0.000E+00 | 0.0000 | 3.836E-07 | 0.0005 |
| U-234 | 0.000E+00 | 0.0000 | 3.888E-10 | 0.0000 |
| U-235 | 0.000E+00 | 0.0000 | 6.928E-07 | 0.0009 |
| U-238 | 0.000E+00 | 0.0000 | 2.863E-06 | 0.0039 |
| Total | 0.000E+00 | 0.0000 | 7.327E-04 | 1.0000 |

** Sum of water independent ground, inhalation, plant, meat, milk, soil
 and water dependent water, fish, plant, meat, milk pathways

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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
 Radon and its Decay Products at t= 3.000E+02 years
 Radionuclides

| Radon Pathway | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Water-ind. | 0.000E+00 |
| Water-dep. | 0.000E+00 |
| Total | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 3.000E+02 years

| Radio-Nuclide | Ground | | Inhalation | | Radon | | Plant | | Meat | | Milk | | Soil | |
|---------------|-----------|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 1.064E-10 | 0.0000 | 5.061E-14 | 0.0000 | 0.000E+00 | 0.0000 | 5.501E-12 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 5.319E-12 | 0.0000 |
| Pa-231 | 2.120E-05 | 0.0289 | 1.125E-08 | 0.0000 | 0.000E+00 | 0.0000 | 2.428E-06 | 0.0033 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.286E-06 | 0.0018 |
| Ra-226 | 2.913E-04 | 0.3976 | 2.970E-09 | 0.0000 | 0.000E+00 | 0.0000 | 8.949E-05 | 0.1221 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.506E-06 | 0.0102 |
| Ra-228 | 1.116E-20 | 0.0000 | 5.081E-25 | 0.0000 | 0.000E+00 | 0.0000 | 1.870E-21 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.530E-22 | 0.0000 |
| Th-230 | 3.317E-05 | 0.0453 | 3.484E-09 | 0.0000 | 0.000E+00 | 0.0000 | 9.619E-06 | 0.0131 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.200E-06 | 0.0016 |
| Th-232 | 2.198E-04 | 0.3000 | 1.150E-08 | 0.0000 | 0.000E+00 | 0.0000 | 4.828E-05 | 0.0659 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.774E-06 | 0.0052 |
| U-235 | 6.778E-07 | 0.0009 | 4.744E-11 | 0.0000 | 0.000E+00 | 0.0000 | 1.524E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.331E-08 | 0.0000 |
| U-238 | 2.307E-06 | 0.0031 | 6.384E-10 | 0.0000 | 0.000E+00 | 0.0000 | 2.859E-07 | 0.0004 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.706E-07 | 0.0004 |
| Total | 5.685E-04 | 0.7759 | 2.989E-08 | 0.0000 | 0.000E+00 | 0.0000 | 1.501E-04 | 0.2049 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.405E-05 | 0.0192 |

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 3.000E+02 years

| Radio-Nuclide | Water | | Fish | | Radon | | Plant | | Meat | | Milk | | All pathways | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|--------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 1.173E-10 | 0.0000 |
| Pa-231 | 0.000E+00 | 0.0000 | 2.492E-05 | 0.0340 |
| Ra-226 | 0.000E+00 | 0.0000 | 3.883E-04 | 0.5300 |
| Ra-228 | 0.000E+00 | 0.0000 | 1.318E-20 | 0.0000 |
| Th-230 | 0.000E+00 | 0.0000 | 4.399E-05 | 0.0600 |
| Th-232 | 0.000E+00 | 0.0000 | 2.719E-04 | 0.3711 |
| U-235 | 0.000E+00 | 0.0000 | 7.064E-07 | 0.0010 |
| U-238 | 0.000E+00 | 0.0000 | 2.864E-06 | 0.0039 |
| Total | 0.000E+00 | 0.0000 | 7.327E-04 | 1.0000 |

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As pCi/yr at t= 1.000E+03 years

| Radio-Nuclide | Water Independent Pathways (Inhalation w/o radon) | | | | | Water Dependent Pathways | | | | | Total Ingestion* |
|---------------|---|-----------|-----------|-----------|-----------|--------------------------|-----------|-----------|-----------|-----------|------------------|
| | Inhalation | Plant | Meat | Milk | Soil | Water | Fish | Plant | Meat | Milk | |
| Ac-227 | 8.876E-04 | 3.094E+01 | 0.000E+00 | 0.000E+00 | 1.676E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 4.770E+01 |
| Pa-231 | 9.166E-04 | 1.273E+02 | 0.000E+00 | 0.000E+00 | 1.730E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.446E+02 |
| Pb-210 | 3.058E-03 | 4.262E+02 | 0.000E+00 | 0.000E+00 | 5.774E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 4.839E+02 |
| Ra-226 | 3.051E-03 | 1.695E+03 | 0.000E+00 | 0.000E+00 | 5.761E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.753E+03 |
| Ra-228 | 2.002E-03 | 1.108E+03 | 0.000E+00 | 0.000E+00 | 3.780E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.146E+03 |
| Th-228 | 2.002E-03 | 4.139E+01 | 0.000E+00 | 0.000E+00 | 3.780E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.919E+01 |
| Th-230 | 3.681E-03 | 5.116E+01 | 0.000E+00 | 0.000E+00 | 6.950E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.207E+02 |
| Th-232 | 2.011E-03 | 2.794E+01 | 0.000E+00 | 0.000E+00 | 3.796E+C1 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.590E+01 |
| U-234 | 3.944E-06 | 1.370E-01 | 0.000E+00 | 0.000E+00 | 7.446E-C2 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.114E-01 |
| U-235 | 8.343E-05 | 2.898E+00 | 0.000E+00 | 0.000E+00 | 1.575E+C0 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 4.473E+00 |
| U-238 | 1.393E-03 | 4.839E+01 | 0.000E+00 | 0.000E+00 | 2.630E+C1 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.470E+01 |

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
 and water-dependent water, fish, plant, meat, milk pathways

0
 Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
 Radon and its Decay Products as pCi/yr at t= 1.000E+03 years

| Radon Pathway | Radionuclides | | | | | | | |
|---------------|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
| Water-ind. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Water-dep. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Total | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+03 years

| Radio-Nuclide | Water Independent Pathways (Inhalation excludes radon) | | | | | | | | | | | |
|---------------|--|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | Ground | | Inhalation | | Plant | | Meat | | Milk | | Soil | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 1.156E-05 | 0.0194 | 5.495E-09 | 0.0000 | 5.994E-07 | 0.0010 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 5.775E-07 | 0.0010 |
| Pa-231 | 1.129E-06 | 0.0019 | 1.237E-09 | 0.0000 | 8.538E-07 | 0.0014 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.920E-07 | 0.0003 |
| Pb-210 | 1.160E-07 | 0.0002 | 1.266E-09 | 0.0000 | 4.374E-05 | 0.0736 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.581E-06 | 0.0077 |
| Ra-226 | 2.294E-04 | 0.3858 | 1.052E-09 | 0.0000 | 2.602E-05 | 0.0438 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.254E-06 | 0.0021 |
| Ra-228 | 8.091E-05 | 0.1361 | 3.141E-10 | 0.0000 | 4.762E-05 | 0.0801 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.592E-06 | 0.0044 |
| Th-228 | 1.388E-04 | 0.2335 | 8.567E-09 | 0.0000 | 5.244E-07 | 0.0009 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.171E-07 | 0.0015 |
| Th-230 | 2.738E-08 | 0.0000 | 3.147E-09 | 0.0000 | 1.826E-07 | 0.0003 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.211E-07 | 0.0007 |
| Th-232 | 6.277E-09 | 0.0000 | 2.612E-09 | 0.0000 | 1.115E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.631E-07 | 0.0004 |
| U-234 | 9.117E-12 | 0.0000 | 1.354E-12 | 0.0000 | 3.941E-10 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.544E-10 | 0.0000 |
| U-235 | 4.040E-07 | 0.0007 | 2.501E-11 | 0.0000 | 8.398E-09 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.637E-09 | 0.0000 |
| U-238 | 1.399E-06 | 0.0024 | 3.867E-10 | 0.0000 | 1.732E-07 | 0.0003 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.640E-07 | 0.0003 |
| Total | 4.637E-04 | 0.7800 | 2.410E-08 | 0.0000 | 1.198E-04 | 0.2015 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.097E-05 | 0.0185 |

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+03 years

Water Dependent Pathways

| Radio-Nuclide | Water Dependent Pathways | | | | | | | | | | | |
|---------------|--------------------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|----------------|--------|
| | Water | | Fish | | Plant | | Meat | | Milk | | All Pathways** | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.274E-05 | 0.0214 |
| Pa-231 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.176E-06 | 0.0037 |
| Pb-210 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.844E-05 | 0.0815 |
| Ra-226 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.566E-04 | 0.4316 |
| Ra-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.311E-04 | 0.2205 |
| Th-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.403E-04 | 0.2359 |
| Th-230 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.343E-07 | 0.0011 |
| Th-232 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.834E-07 | 0.0006 |
| U-234 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.590E-10 | 0.0000 |
| U-235 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.201E-07 | 0.0007 |
| U-238 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.736E-06 | 0.0029 |
| Total | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 5.946E-04 | 1.0000 |

** Sum of water independent ground, inhalation, plant, meat, milk, soil
 and water dependent water, fish, plant, meat, milk pathways

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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
 Radon and its Decay Products at t= 1.000E+03 years
 Radionuclides

| Radon Pathway | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Water-ind. | 0.000E+00 |
| Water-dep. | 0.000E+00 |
| Total | 0.000E+00 |

Water-ind. == Water-independent . Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,z)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+03 years

| Radio-Nuclide | Ground | | Inhalation | | Radon | | Plant | | Meat | | Milk | | Soil | |
|---------------|-----------|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 5.463E-21 | 0.0000 | 3.073E-24 | 0.0000 | 0.000E+00 | 0.0000 | 3.340E-22 | 0.0000 | 0.00CE+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.229E-22 | 0.0000 |
| Pa-231 | 1.266E-05 | 0.0213 | 6.720E-09 | 0.0000 | 0.000E+00 | 0.0000 | 1.450E-06 | 0.0024 | 0.00CE+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.681E-07 | 0.0013 |
| Ra-226 | 1.504E-04 | 0.2529 | 1.533E-09 | 0.0000 | 0.000E+00 | 0.0000 | 4.620E-05 | 0.0777 | 0.00CE+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.875E-06 | 0.0065 |
| Ra-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 |
| Th-230 | 7.912E-05 | 0.1331 | 3.932E-09 | 0.0000 | 0.000E+00 | 0.0000 | 2.374E-05 | 0.0399 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.381E-06 | 0.0040 |
| Th-232 | 2.197E-04 | 0.3696 | 1.149E-08 | 0.0000 | 0.000E+00 | 0.0000 | 4.826E-05 | 0.0812 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.772E-06 | 0.0063 |
| U-235 | 4.279E-07 | 0.0007 | 3.772E-11 | 0.0000 | 0.000E+00 | 0.0000 | 1.117E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.092E-09 | 0.0000 |
| U-238 | 1.399E-06 | 0.0024 | 3.880E-10 | 0.0000 | 0.000E+00 | 0.0000 | 1.737E-07 | 0.0003 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.643E-07 | 0.0003 |
| Total | 4.637E-04 | 0.7800 | 2.410E-08 | 0.0000 | 0.000E+00 | 0.0000 | 1.198E-04 | 0.2015 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.097E-05 | 0.0185 |

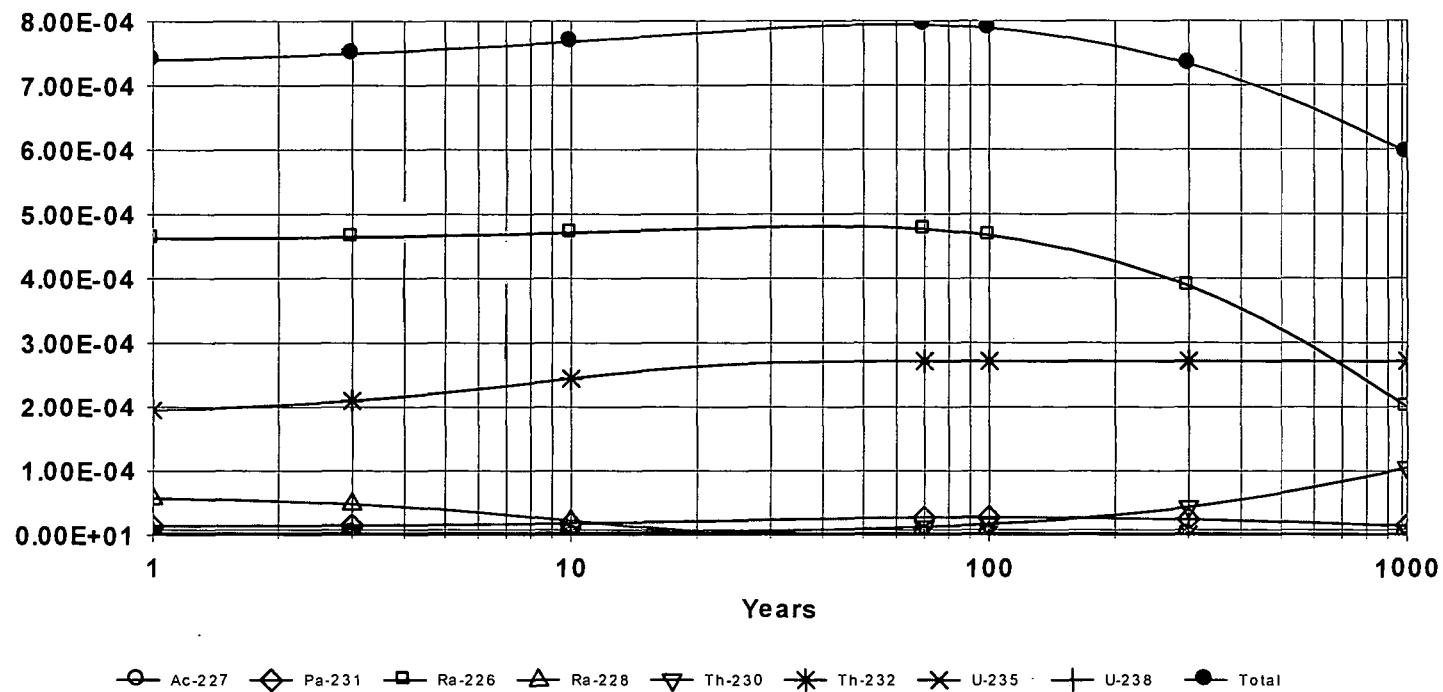
Total Excess Cancer Risk CNRS(i,p,z)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+03 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Radon | | Plant | | Meat | | Milk | | All pathways | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|--------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 7.123E-21 | 0.0000 |
| Pa-231 | 0.000E+00 | 0.0000 | 1.489E-05 | 0.0250 |
| Ra-226 | 0.000E+00 | 0.0000 | 2.005E-04 | 0.3372 |
| Ra-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 |
| Th-230 | 0.000E+00 | 0.0000 | 1.052E-04 | 0.1770 |
| Th-232 | 0.000E+00 | 0.0000 | 2.718E-04 | 0.4571 |
| U-235 | 0.000E+00 | 0.0000 | 4.482E-07 | 0.0008 |
| U-238 | 0.000E+00 | 0.0000 | 1.737E-06 | 0.0029 |
| Total | 0.000E+00 | 0.0000 | 5.946E-04 | 1.0000 |

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

EXCESS CANCER RISK: All Nuclides Summed, All Pathways Summed



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Attachment B

**RESRAD Output for 95% UCL Background Cancer Risks Calculated for Hypothetical
Resident Gardener Exposures to Accessible Soil**

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Intrinsic : SLDS Background Accessible Soil Resident RI Final
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Part III: Intake Quantities and Health Risk Factors

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| Cancer Risk Slope Factors | 2 |
| Risk Slope and ETRG for the Ground Pathway | 4 |
| Amount of Intake Quantities and Excess Cancer Risks | |
| Time= 0.000E+00 | 5 |
| Time= 1.000E+00 | 9 |
| Time= 3.000E+00 | 13 |
| Time= 1.000E+01 | 17 |
| Time= 7.000E+01 | 21 |
| Time= 1.000E+02 | 25 |
| Time= 3.000E+02 | 29 |
| Time= 1.000E+03 | 33 |

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Cancer Risk Slope Factors Summary Table
 Risk Library: HEAST 2001 Morbidity

| 0 Menu | Parameter | Current Value | Base Case* | Parameter Name |
|-----------|--|---------------|------------|----------------|
| Sf-1 | Ground external radiation slope factors, 1/yr per (pCi/g): | | | |
| Sf-1 | Ac-227+D | 1.47E-06 | 3.48E-10 | SLPF(1,1) |
| Sf-1 | Pa-231 | 1.39E-07 | 1.39E-07 | SLPF(2,1) |
| Sf-1 | Pb-210+D | 4.21E-09 | 1.41E-09 | SLPF(3,1) |
| Sf-1 | Ra-226+D | 8.49E-06 | 2.29E-08 | SLPF(4,1) |
| Sf-1 | Ra-228+D | 4.53E-06 | 0.00E+00 | SLPF(5,1) |
| Sf-1 | Th-228+D | 7.76E-06 | 5.59E-09 | SLPF(6,1) |
| Sf-1 | Th-230 | 8.19E-10 | 8.19E-10 | SLPF(7,1) |
| Sf-1 | Th-232 | 3.42E-10 | 3.42E-10 | SLPF(8,1) |
| Sf-1 | U-234 | 2.52E-10 | 2.52E-10 | SLPF(9,1) |
| Sf-1 | U-235+D | 5.43E-07 | 5.18E-07 | SLPF(10,1) |
| Sf-1 | U-238 | 4.99E-11 | 4.99E-11 | SLPF(11,1) |
| Sf-1 | U-238+D | 1.14E-07 | 4.99E-11 | SLPF(12,1) |
| Sf-2 | Inhalation, slope factors, 1/(pCi): | | | |
| Sf-2 | Ac-227+D | 2.09E-07 | 1.49E-07 | SLPF(1,2) |
| Sf-2 | Pa-231 | 4.55E-08 | 4.55E-08 | SLPF(2,2) |
| Sf-2 | Pb-210+D | 1.39E-08 | 2.77E-09 | SLPF(3,2) |
| Sf-2 | Ra-226+D | 1.16E-08 | 1.15E-08 | SLPF(4,2) |
| Sf-2 | Ra-228+D | 5.23E-09 | 5.18E-09 | SLPF(5,2) |
| Sf-2 | Th-228+D | 1.43E-07 | 1.32E-07 | SLPF(6,2) |
| Sf-2 | Th-230 | 2.85E-08 | 2.85E-08 | SLPF(7,2) |
| Sf-2 | Th-232 | 4.33E-08 | 4.33E-08 | SLPF(8,2) |
| Sf-2 | U-234 | 1.14E-08 | 1.14E-08 | SLPF(9,2) |
| Sf-2 | U-235+D | 1.01E-08 | 1.01E-08 | SLPF(10,2) |
| Sf-2 | U-238 | 9.32E-09 | 9.32E-09 | SLPF(11,2) |
| Sf-2 | U-238+D | 9.35E-09 | 9.32E-09 | SLPF(12,2) |
| Sf-3 | Food ingestion, slope factors, 1/(pCi): | | | |
| Sf-3 | Ac-227+D | 6.53E-10 | 2.45E-10 | SLPF(1,3) |
| Sf-3 | Pa-231 | 2.26E-10 | 2.26E-10 | SLPF(2,3) |
| Sf-3 | Pb-210+D | 3.44E-09 | 1.18E-09 | SLPF(3,3) |
| Sf-3 | Ra-226+D | 5.15E-10 | 5.14E-10 | SLPF(4,3) |
| Sf-3 | Ra-228+D | 1.43E-09 | 1.43E-09 | SLPF(5,3) |
| Sf-3 | Th-228+D | 4.22E-10 | 1.48E-10 | SLPF(6,3) |
| Sf-3 | Th-230 | 1.19E-10 | 1.19E-10 | SLPF(7,3) |
| Sf-3 | Th-232 | 1.33E-10 | 1.33E-10 | SLPF(8,3) |
| Sf-3 | U-234 | 9.55E-11 | 9.55E-11 | SLPF(9,3) |
| Sf-3 | U-235+D | 9.76E-11 | 9.44E-11 | SLPF(10,3) |
| Sf-3 | U-238 | 8.66E-11 | 8.66E-11 | SLPF(11,3) |
| Sf-3 | U-238+D | 1.21E-10 | 8.66E-11 | SLPF(12,3) |
| Sf-3 | Water ingestion, slope factors, 1/(pCi): | | | |
| Sf-3 | Ac-227+D | 4.86E-10 | 2.01E-10 | SLPF(1,4) |
| Sf-3 | Pa-231 | 1.73E-10 | 1.73E-10 | SLPF(2,4) |
| Sf-3 | Pb-210+D | 1.27E-09 | 8.81E-10 | SLPF(3,4) |
| Sf-3 | Ra-226+D | 3.86E-10 | 3.85E-10 | SLPF(4,4) |
| Sf-3 | Ra-228+D | 1.04E-09 | 1.04E-09 | SLPF(5,4) |
| Sf-3 | Th-228+D | 3.00E-10 | 1.07E-10 | SLPF(6,4) |
| Sf-3 | Th-230 | 9.10E-11 | 9.10E-11 | SLPF(7,4) |

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Cancer Risk Slope Factors Summary Table (continued)
 Risk Library: HEAST 2001 Morbidity

| 0 Menu | Parameter | Current Value | Base Case* | Parameter Name |
|-----------|--|---------------|------------|----------------|
| Sf-3 | Th-232 | 1.01E-10 | 1.01E-10 | SLPF(8,4) |
| Sf-3 | U-234 | 7.07E-11 | 7.07E-11 | SLPF(9,4) |
| Sf-3 | U-235+D | 7.18E-11 | 6.96E-11 | SLPF(10,4) |
| Sf-3 | U-238 | 6.40E-11 | 6.40E-11 | SLPF(11,4) |
| Sf-3 | U-238+D | 8.71E-11 | 6.40E-11 | SLPF(12,4) |
| Sf-3 | Soil ingestion, slope factors, 1/(pCi): | | | |
| Sf-3 | Ac-227+D | 1.16E-09 | 3.81E-10 | SLPF(1,5) |
| Sf-3 | Pa-231 | 3.74E-10 | 3.74E-10 | SLPF(2,5) |
| Sf-3 | Pb-210+D | 2.66E-09 | 1.84E-09 | SLPF(3,5) |
| Sf-3 | Ra-226+D | 7.30E-10 | 7.29E-10 | SLPF(4,5) |
| Sf-3 | Ra-228+D | 2.29E-09 | 2.28E-09 | SLPF(5,5) |
| Sf-3 | Th-228+D | 8.09E-10 | 2.89E-10 | SLPF(6,5) |
| Sf-3 | Th-230 | 2.02E-10 | 2.02E-10 | SLPF(7,5) |
| Sf-3 | Th-232 | 2.31E-10 | 2.31E-10 | SLPF(8,5) |
| Sf-3 | U-234 | 1.58E-10 | 1.58E-10 | SLPF(9,5) |
| Sf-3 | U-235+D | 1.63E-10 | 1.57E-10 | SLPF(10,5) |
| Sf-3 | U-238 | 1.43E-10 | 1.43E-10 | SLPF(11,5) |
| Sf-3 | U-238+D | 2.10E-10 | 1.43E-10 | SLPF(12,5) |
| Sf-Rn | Radon Inhalation slope factors, 1/(pCi): | | | |
| Sf-Rn | Rn-222 | 1.80E-12 | 1.80E-12 | SLPFRN(1,1) |
| Sf-Rn | Po-218 | 3.70E-12 | 3.70E-12 | SLPFRN(1,2) |
| Sf-Rn | Pb-214 | 6.20E-12 | 6.20E-12 | SLPFRN(1,3) |
| Sf-Rn | Bi-214 | 1.50E-11 | 1.50E-11 | SLPFRN(1,4) |
| Sf-Rn | Rn-220 | 1.90E-13 | 1.90E-13 | SLPFRN(2,1) |
| Sf-Rn | Po-216 | 3.00E-15 | 3.00E-15 | SLPFRN(2,2) |
| Sf-Rn | Pb-212 | 3.90E-11 | 3.90E-11 | SLPFRN(2,3) |
| Sf-Rn | Bi-212 | 3.70E-11 | 3.70E-11 | SLPFRN(2,4) |
| Sf-Rn | Radon K factors, (mrem/WLM): | | | |
| Sf-Rn | Rn-222 Indoor | 7.60E+02 | 7.60E+02 | KFACTR(1,1) |
| Sf-Rn | Rn-222 Outdoor | 5.70E+02 | 5.70E+02 | KFACTR(1,2) |
| Sf-Rn | Rn-220 Indoor | 1.50E+02 | 1.50E+02 | KFACTR(2,1) |
| Sf-Rn | Rn-220 Outdoor | 2.50E+02 | 2.50E+02 | KFACTR(2,2) |

*Base Case means Default.Lib w/o Associate Nuclide contributions.

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| ONuclide (i) | Slope(i)* | Risk Slope and Environmental Transport Factors for the Ground Pathway | | | | | | | |
|-----------------|-----------|---|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | | t= 0.000E+00 | 1.000E+00 | 3.000E+00 | 1.000E+01 | 7.000E+01 | 1.000E+02 | 3.000E+02 | 1.000E+03 |
| Ac-227 | 3.480E-10 | 5.151E-01 | 5.151E-01 | 5.151E-01 | 5.151E-01 | 5.151E-01 | 5.151E-01 | 5.151E-01 | 5.151E-01 |
| Ac-228 | 4.530E-06 | 5.070E-01 | 5.070E-01 | 5.070E-01 | 5.070E-01 | 5.070E-01 | 5.070E-01 | 5.070E-01 | 5.070E-01 |
| At-218 | 3.570E-09 | 5.224E-01 | 5.224E-01 | 5.224E-01 | 5.224E-01 | 5.224E-01 | 5.224E-01 | 5.224E-01 | 5.224E-01 |
| Bi-210 | 2.760E-09 | 5.088E-01 | 5.088E-01 | 5.088E-01 | 5.088E-01 | 5.088E-01 | 5.088E-01 | 5.088E-01 | 5.088E-01 |
| Bi-211 | 1.880E-07 | 5.089E-01 | 5.089E-01 | 5.089E-01 | 5.089E-01 | 5.089E-01 | 5.089E-01 | 5.089E-01 | 5.089E-01 |
| Bi-212 | 8.870E-07 | 5.048E-01 | 5.048E-01 | 5.048E-01 | 5.048E-01 | 5.048E-01 | 5.048E-01 | 5.048E-01 | 5.048E-01 |
| Bi-214 | 7.480E-06 | 5.061E-01 | 5.061E-01 | 5.061E-01 | 5.061E-01 | 5.061E-01 | 5.061E-01 | 5.061E-01 | 5.061E-01 |
| Fr-223 | 1.400E-07 | 5.116E-01 | 5.116E-01 | 5.116E-01 | 5.116E-01 | 5.116E-01 | 5.116E-01 | 5.116E-01 | 5.116E-01 |
| Pa-231 | 1.390E-07 | 5.091E-01 | 5.091E-01 | 5.091E-01 | 5.091E-01 | 5.091E-01 | 5.091E-01 | 5.091E-01 | 5.091E-01 |
| Pa-234 | 8.710E-06 | 5.061E-01 | 5.061E-01 | 5.061E-01 | 5.061E-01 | 5.061E-01 | 5.061E-01 | 5.061E-01 | 5.061E-01 |
| Pa-234m | 6.870E-08 | 5.057E-01 | 5.057E-01 | 5.057E-01 | 5.057E-01 | 5.057E-01 | 5.057E-01 | 5.057E-01 | 5.057E-01 |
| Pb-210 | 1.410E-09 | 5.283E-01 | 5.283E-01 | 5.283E-01 | 5.283E-01 | 5.283E-01 | 5.283E-01 | 5.283E-01 | 5.283E-01 |
| Pb-211 | 2.290E-07 | 5.060E-01 | 5.060E-01 | 5.060E-01 | 5.060E-01 | 5.060E-01 | 5.060E-01 | 5.060E-01 | 5.060E-01 |
| Pb-212 | 5.090E-07 | 5.123E-01 | 5.123E-01 | 5.123E-01 | 5.123E-01 | 5.123E-01 | 5.123E-01 | 5.123E-01 | 5.123E-01 |
| Pb-214 | 9.820E-07 | 5.091E-01 | 5.091E-01 | 5.091E-01 | 5.091E-01 | 5.091E-01 | 5.091E-01 | 5.091E-01 | 5.091E-01 |
| Po-210 | 3.950E-11 | 5.056E-01 | 5.056E-01 | 5.056E-01 | 5.056E-01 | 5.056E-01 | 5.056E-01 | 5.056E-01 | 5.056E-01 |
| Po-211 | 3.580E-08 | 5.040E-01 | 5.040E-01 | 5.040E-01 | 5.040E-01 | 5.040E-01 | 5.040E-01 | 5.040E-01 | 5.040E-01 |
| Po-212 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Po-214 | 3.860E-10 | 5.040E-01 | 5.040E-01 | 5.040E-01 | 5.040E-01 | 5.040E-01 | 5.040E-01 | 5.040E-01 | 5.040E-01 |
| Po-215 | 7.480E-10 | 5.067E-01 | 5.067E-01 | 5.067E-01 | 5.067E-01 | 5.067E-01 | 5.067E-01 | 5.067E-01 | 5.067E-01 |
| Po-216 | 7.870E-11 | 5.056E-01 | 5.056E-01 | 5.056E-01 | 5.056E-01 | 5.056E-01 | 5.056E-01 | 5.056E-01 | 5.056E-01 |
| Po-218 | 4.260E-11 | 5.056E-01 | 5.056E-01 | 5.056E-01 | 5.056E-01 | 5.056E-01 | 5.056E-01 | 5.056E-01 | 5.056E-01 |
| Ra-223 | 4.340E-07 | 5.113E-01 | 5.113E-01 | 5.113E-01 | 5.113E-01 | 5.113E-01 | 5.113E-01 | 5.113E-01 | 5.113E-01 |
| Ra-224 | 3.720E-08 | 5.115E-01 | 5.115E-01 | 5.115E-01 | 5.115E-01 | 5.115E-01 | 5.115E-01 | 5.115E-01 | 5.115E-01 |
| Ra-226 | 2.290E-08 | 5.128E-01 | 5.128E-01 | 5.128E-01 | 5.128E-01 | 5.128E-01 | 5.128E-01 | 5.128E-01 | 5.128E-01 |
| Ra-228 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Rn-219 | 2.250E-07 | 5.094E-01 | 5.094E-01 | 5.094E-01 | 5.094E-01 | 5.094E-01 | 5.094E-01 | 5.094E-01 | 5.094E-01 |
| Rn-220 | 1.700E-09 | 5.045E-01 | 5.045E-01 | 5.045E-01 | 5.045E-01 | 5.045E-01 | 5.045E-01 | 5.045E-01 | 5.045E-01 |
| Rn-222 | 1.740E-09 | 5.045E-01 | 5.045E-01 | 5.045E-01 | 5.045E-01 | 5.045E-01 | 5.045E-01 | 5.045E-01 | 5.045E-01 |
| Th-227 | 3.780E-07 | 5.119E-01 | 5.119E-01 | 5.119E-01 | 5.119E-01 | 5.119E-01 | 5.119E-01 | 5.119E-01 | 5.119E-01 |
| Th-228 | 5.590E-09 | 5.142E-01 | 5.142E-01 | 5.142E-01 | 5.142E-01 | 5.142E-01 | 5.142E-01 | 5.142E-01 | 5.142E-01 |
| Th-230 | 8.190E-10 | 5.162E-01 | 5.162E-01 | 5.162E-01 | 5.162E-01 | 5.162E-01 | 5.162E-01 | 5.162E-01 | 5.162E-01 |
| Th-231 | 2.450E-08 | 5.168E-01 | 5.168E-01 | 5.168E-01 | 5.168E-01 | 5.168E-01 | 5.168E-01 | 5.168E-01 | 5.168E-01 |
| Th-232 | 3.420E-10 | 5.188E-01 | 5.188E-01 | 5.188E-01 | 5.188E-01 | 5.188E-01 | 5.188E-01 | 5.188E-01 | 5.188E-01 |
| Th-234 | 1.630E-08 | 5.174E-01 | 5.174E-01 | 5.174E-01 | 5.174E-01 | 5.174E-01 | 5.174E-01 | 5.174E-01 | 5.174E-01 |
| Tl-207 | 1.520E-08 | 5.062E-01 | 5.062E-01 | 5.062E-01 | 5.062E-01 | 5.062E-01 | 5.062E-01 | 5.062E-01 | 5.062E-01 |
| Tl-208 | 1.760E-05 | 5.075E-01 | 5.075E-01 | 5.075E-01 | 5.075E-01 | 5.075E-01 | 5.075E-01 | 5.075E-01 | 5.075E-01 |
| Tl-210 | 0.000E+00 | 5.384E-01 | 5.384E-01 | 5.384E-01 | 5.384E-01 | 5.384E-01 | 5.384E-01 | 5.384E-01 | 5.384E-01 |
| U-234 | 2.520E-10 | 5.192E-01 | 5.192E-01 | 5.192E-01 | 5.192E-01 | 5.192E-01 | 5.192E-01 | 5.192E-01 | 5.192E-01 |
| U-235 | 5.180E-07 | 5.125E-01 | 5.125E-01 | 5.125E-01 | 5.125E-01 | 5.125E-01 | 5.125E-01 | 5.125E-01 | 5.125E-01 |
| U-238 | 4.990E-11 | 5.337E-01 | 5.337E-01 | 5.337E-01 | 5.337E-01 | 5.337E-01 | 5.337E-01 | 5.337E-01 | 5.337E-01 |

* - Units are 1/yr per (pCi/g) at infinite depth and area. Multiplication by ETFG(i,t) converts to site conditions.

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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As pCi/yr at t= 0.000E+00 years

| Radio-Nuclide | Water Independent Pathways (Inhalation w/o radon) | | | | | Water Dependent Pathways | | | | | Total Ingestion* |
|---------------|---|-----------|-----------|-----------|-----------|--------------------------|-----------|-----------|-----------|-----------|------------------|
| | Inhalation | Plant | Meat | Milk | Soil | Water | Fish | Plant | Meat | Milk | |
| Ac-227 | 3.069E-04 | 1.066E+01 | 0.000E+00 | 0.000E+00 | 5.794E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.645E+01 |
| Pa-231 | 1.909E-03 | 2.652E+02 | 0.000E+00 | 0.000E+00 | 3.635E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 3.013E+02 |
| Pb-210 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Ra-226 | 5.183E-03 | 2.880E+03 | 0.000E+00 | 0.000E+00 | 9.785E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.977E+03 |
| Ra-228 | 1.705E-03 | 9.472E+02 | 0.000E+00 | 0.000E+00 | 3.219E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 9.794E+02 |
| Th-228 | 2.148E-03 | 2.966E+01 | 0.000E+00 | 0.000E+00 | 4.056E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.041E+01 |
| Th-230 | 3.717E-03 | 5.166E+01 | 0.000E+00 | 0.000E+00 | 7.017E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.218E+02 |
| Th-232 | 2.012E-03 | 2.796E+01 | 0.000E+00 | 0.000E+00 | 3.798E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.594E+01 |
| U-234 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| U-235 | 1.705E-04 | 5.921E+00 | 0.000E+00 | 0.000E+00 | 3.219E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 9.140E+00 |
| U-238 | 2.847E-03 | 9.889E+01 | 0.000E+00 | 0.000E+00 | 5.375E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.526E+02 |

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
 and water-dependent water, fish, plant, meat, milk pathways

0 Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
 Radon and its Decay Products as pCi/yr at t= 0.000E+00 years

| Radon Pathway | Radionuclides | | | | | | | |
|---------------|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
| Water-ind. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Water-dep. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Total | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |

Water-ind. == Water-independent

Water-dep. == Water-dependent

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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 0.000E+00 years

| Radio-Nuclide | Water Independent Pathways (Inhalation excludes radon) | | | | | | | | | | | |
|---------------|--|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | Ground | | Inhalation | | Plant | | Meat | | Milk | | Soil | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 1.129E-05 | 0.0151 | 5.367E-09 | 0.0000 | 5.876E-07 | 0.0008 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 5.640E-07 | 0.0008 |
| Pa-231 | 2.352E-06 | 0.0031 | 2.578E-09 | 0.0000 | 1.779E-06 | 0.0024 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.001E-07 | 0.0005 |
| Pb-210 | 6.850E-08 | 0.0001 | 7.476E-10 | 0.0000 | 2.598E-05 | 0.0348 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.705E-06 | 0.0036 |
| Ra-226 | 3.883E-04 | 0.5196 | 1.781E-09 | 0.0000 | 4.405E-05 | 0.0589 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.124E-06 | 0.0028 |
| Ra-228 | 7.772E-05 | 0.1040 | 3.017E-10 | 0.0000 | 4.574E-05 | 0.0612 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.490E-06 | 0.0033 |
| Th-228 | 1.344E-04 | 0.1798 | 8.292E-09 | 0.0000 | 5.055E-07 | 0.0007 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.877E-07 | 0.0012 |
| Th-230 | 2.764E-08 | 0.0000 | 3.177E-09 | 0.0000 | 1.844E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.252E-07 | 0.0006 |
| Th-232 | 6.281E-09 | 0.0000 | 2.613E-09 | 0.0000 | 1.116E-07 | 0.0001 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.632E-07 | 0.0004 |
| U-234 | 2.747E-13 | 0.0000 | 4.082E-14 | 0.0000 | 1.188E-11 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.068E-11 | 0.0000 |
| U-235 | 8.256E-07 | 0.0011 | 5.112E-11 | 0.0000 | 1.716E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.561E-08 | 0.0000 |
| U-238 | 2.858E-06 | 0.0038 | 7.902E-10 | 0.0000 | 3.540E-07 | 0.0005 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.351E-07 | 0.0004 |
| Total | 6.178E-04 | 0.8267 | 2.570E-08 | 0.0000 | 1.193E-04 | 0.1596 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.021E-05 | 0.0137 |

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 0.000E+00 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Plant | | Meat | | Milk | | All Pathways** | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|----------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 1.244E-05 | 0.0167 |
| Pa-231 | 0.000E+00 | 0.0000 | 4.533E-06 | 0.0061 |
| Pb-210 | 0.000E+00 | 0.0000 | 2.876E-05 | 0.0385 |
| Ra-226 | 0.000E+00 | 0.0000 | 4.345E-04 | 0.5814 |
| Ra-228 | 0.000E+00 | 0.0000 | 1.260E-04 | 0.1685 |
| Th-228 | 0.000E+00 | 0.0000 | 1.358E-04 | 0.1816 |
| Th-230 | 0.000E+00 | 0.0000 | 6.404E-07 | 0.0009 |
| Th-232 | 0.000E+00 | 0.0000 | 3.837E-07 | 0.0005 |
| U-234 | 0.000E+00 | 0.0000 | 2.287E-11 | 0.0000 |
| U-235 | 0.000E+00 | 0.0000 | 8.584E-07 | 0.0011 |
| U-238 | 0.000E+00 | 0.0000 | 3.548E-06 | 0.0047 |
| Total | 0.000E+00 | 0.0000 | 7.474E-04 | 1.0000 |

** Sum of water independent ground, inhalation, plant, meat, milk, soil
 and water dependent water, fish, plant, meat, milk pathways

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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
 Radon and its Decay Products at t= 0.000E+00 years
 Radionuclides

| Radon Pathway | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Water-ind. | 0.000E+00 |
| Water-dep. | 0.000E+00 |
| Total | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 0.000E+00 years

| Radio-Nuclide | Ground | | Inhalation | | Radon | | Plant | | Meat | | Milk | | Soil | |
|---------------|-----------|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 2.545E-06 | 0.0034 | 1.210E-09 | 0.0000 | 0.000E+00 | 0.0000 | 1.315E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.272E-07 | 0.0002 |
| Pa-231 | 1.109E-05 | 0.0148 | 6.735E-09 | 0.0000 | 0.000E+00 | 0.0000 | 2.235E-06 | 0.0030 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.369E-07 | 0.0011 |
| Ra-226 | 3.866E-04 | 0.5173 | 2.518E-09 | 0.0000 | 0.000E+00 | 0.0000 | 6.974E-05 | 0.0933 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.810E-06 | 0.0064 |
| Ra-228 | 4.973E-05 | 0.0665 | 2.001E-09 | 0.0000 | 0.000E+00 | 0.0000 | 1.103E-05 | 0.0148 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.981E-07 | 0.0011 |
| Th-228 | 1.370E-05 | 0.0183 | 8.457E-10 | 0.0000 | 0.000E+00 | 0.0000 | 3.481E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.053E-08 | 0.0001 |
| Th-230 | 1.837E-06 | 0.0025 | 3.188E-09 | 0.0000 | 0.000E+00 | 0.0000 | 4.761E-07 | 0.0006 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.441E-07 | 0.0006 |
| Th-232 | 1.487E-04 | 0.1989 | 8.361E-09 | 0.0000 | 0.000E+00 | 0.0000 | 3.529E-05 | 0.0472 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.752E-06 | 0.0037 |
| U-235 | 8.258E-07 | 0.0011 | 5.127E-11 | 0.0000 | 0.000E+00 | 0.0000 | 1.722E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.563E-08 | 0.0000 |
| U-238 | 2.858E-06 | 0.0038 | 7.902E-10 | 0.0000 | 0.000E+00 | 0.0000 | 3.540E-07 | 0.0005 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.351E-07 | 0.0004 |
| Total | 6.178E-04 | 0.8267 | 2.570E-08 | 0.0000 | 0.000E+00 | 0.0000 | 1.193E-04 | 0.1596 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.021E-05 | 0.0137 |

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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 0.000E+00 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Radon | | Plant | | Meat | | Milk | | All pathways | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|--------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 2.805E-06 | 0.0038 |
| Pa-231 | 0.000E+00 | 0.0000 | 1.417E-05 | 0.0190 |
| Ra-226 | 0.000E+00 | 0.0000 | 4.611E-04 | 0.6170 |
| Ra-228 | 0.000E+00 | 0.0000 | 6.156E-05 | 0.0824 |
| Th-228 | 0.000E+00 | 0.0000 | 1.383E-05 | 0.0185 |
| Th-230 | 0.000E+00 | 0.0000 | 2.761E-06 | 0.0037 |
| Th-232 | 0.000E+00 | 0.0000 | 1.867E-04 | 0.2498 |
| U-235 | 0.000E+00 | 0.0000 | 8.587E-07 | 0.0011 |
| U-238 | 0.000E+00 | 0.0000 | 3.548E-06 | 0.0047 |
| Total | 0.000E+00 | 0.0000 | 7.474E-04 | 1.0000 |

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As pCi/yr at t= 1.000E+00 years

| Radio-Nuclide | Water Independent Pathways (Inhalation w/o radon) | | | | | Water Dependent Pathways | | | | | Total Ingestion* |
|---------------|---|-----------|-----------|-----------|-----------|--------------------------|-----------|-----------|-----------|-----------|------------------|
| | Inhalation | Plant | Meat | Milk | Soil | Water | Fish | Plant | Meat | Milk | |
| Ac-227 | 3.565E-04 | 1.260E+01 | 0.000E+00 | 0.000E+00 | 6.731E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.933E+01 |
| Pa-231 | 1.908E-03 | 2.650E+02 | 0.000E+00 | 0.000E+00 | 3.602E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 3.011E+02 |
| Pb-210 | 1.585E-04 | 2.436E+01 | 0.000E+00 | 0.000E+00 | 2.993E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.735E+01 |
| Ra-226 | 5.180E-03 | 2.878E+03 | 0.000E+00 | 0.000E+00 | 9.779E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.976E+03 |
| Ra-228 | 1.739E-03 | 9.616E+02 | 0.000E+00 | 0.000E+00 | 3.283E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 9.944E+02 |
| Th-228 | 2.019E-03 | 3.983E+01 | 0.000E+00 | 0.000E+00 | 3.812E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.795E+01 |
| Th-230 | 3.717E-03 | 5.165E+01 | 0.000E+00 | 0.000E+00 | 7.017E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.218E+02 |
| Th-232 | 2.012E-03 | 2.796E+01 | 0.000E+00 | 0.000E+00 | 3.798E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.594E+01 |
| U-234 | 8.065E-09 | 2.801E-04 | 0.000E+00 | 0.000E+00 | 1.523E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 4.324E-04 |
| U-235 | 1.704E-04 | 5.917E+00 | 0.000E+00 | 0.000E+00 | 3.217E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 9.134E+00 |
| U-238 | 2.845E-03 | 9.882E+01 | 0.000E+00 | 0.000E+00 | 5.372E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.525E+02 |

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
 and water-dependent water, fish, plant, meat, milk pathways

0 Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
 Radon and its Decay Products as pCi/yr at t= 1.000E+00 years

| Radon Pathway | Radionuclides | | | | | | | |
|---------------|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
| Water-ind. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Water-dep. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E-00 | 0.000E+00 |
| Total | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E-00 | 0.000E+00 |

Water-ind. == Water-independent

Water-dep. == Water-dependent

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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+00 years

| Radio-Nuclide | Water Independent Pathways (Inhalation excludes radon) | | | | | | | | | | | |
|---------------|--|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | Ground | | Inhalation | | Plant | | Meat | | Milk | | Soil | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 1.169E-05 | 0.0156 | 5.559E-09 | 0.0000 | 6.086E-07 | 0.0008 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 5.842E-07 | 0.0008 |
| Pa-231 | 2.350E-06 | 0.0031 | 2.576E-09 | 0.0000 | 1.777E-06 | 0.0024 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.998E-07 | 0.0005 |
| Pb-210 | 7.237E-08 | 0.0001 | 7.899E-10 | 0.0000 | 2.744E-05 | 0.0366 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.858E-06 | 0.0038 |
| Ra-226 | 3.881E-04 | 0.5178 | 1.780E-09 | 0.0000 | 4.402E-05 | 0.0587 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.122E-06 | 0.0028 |
| Ra-228 | 7.809E-05 | 0.1042 | 3.031E-10 | 0.0000 | 4.596E-05 | 0.0613 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.502E-06 | 0.0033 |
| Th-228 | 1.342E-04 | 0.1790 | 8.280E-09 | 0.0000 | 5.066E-07 | 0.0007 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.863E-07 | 0.0012 |
| Th-230 | 2.764E-08 | 0.0000 | 3.177E-09 | 0.0000 | 1.844E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.252E-07 | 0.0006 |
| Th-232 | 6.281E-09 | 0.0000 | 2.613E-09 | 0.0000 | 1.116E-07 | 0.0001 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.632E-07 | 0.0004 |
| U-234 | 2.929E-13 | 0.0000 | 4.352E-14 | 0.0000 | 1.266E-11 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.139E-11 | 0.0000 |
| U-235 | 8.250E-07 | 0.0011 | 5.108E-11 | 0.0000 | 1.715E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.560E-08 | 0.0000 |
| U-238 | 2.856E-06 | 0.0038 | 7.896E-10 | 0.0000 | 3.538E-07 | 0.0005 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.348E-07 | 0.0004 |
| Total | 6.182E-04 | 0.8247 | 2.592E-08 | 0.0000 | 1.210E-04 | 0.1614 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.039E-05 | 0.0139 |

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+00 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Plant | | Meat | | Milk | | All Pathways** | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|----------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 1.289E-05 | 0.0172 |
| Pa-231 | 0.000E+00 | 0.0000 | 4.530E-06 | 0.0060 |
| Pb-210 | 0.000E+00 | 0.0000 | 3.037E-05 | 0.0405 |
| Ra-226 | 0.000E+00 | 0.0000 | 4.342E-04 | 0.5793 |
| Ra-228 | 0.000E+00 | 0.0000 | 1.266E-04 | 0.1688 |
| Th-228 | 0.000E+00 | 0.0000 | 1.356E-04 | 0.1809 |
| Th-230 | 0.000E+00 | 0.0000 | 6.404E-07 | 0.0009 |
| Th-232 | 0.000E+00 | 0.0000 | 3.837E-07 | 0.0005 |
| U-234 | 0.000E+00 | 0.0000 | 2.439E-11 | 0.0000 |
| U-235 | 0.000E+00 | 0.0000 | 8.578E-07 | 0.0011 |
| U-238 | 0.000E+00 | 0.0000 | 3.546E-06 | 0.0047 |
| Total | 0.000E+00 | 0.0000 | 7.496E-04 | 1.0000 |

** Sum of water independent ground, inhalation, plant, meat, milk, soil
 and water dependent water, fish, plant, meat, milk pathways

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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
 Radon and its Decay Products at t= 1.000E+00 years
 Radionuclides

| Radon Pathway | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
|---------------|-----------|-----------|-----------|------------|-----------|-----------|-----------|-----------|
| Water-ind. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.0003E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Water-dep. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.0003E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Total | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.0003E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,-)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+00 years

| Radio-Nuclide | Ground | | Inhalation | | Radon | | Plant | | Meat | | Milk | | Soil | |
|---------------|-----------|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 2.461E-06 | 0.0033 | 1.170E-09 | 0.3000 | 0.000E+00 | 0.0000 | 1.272E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.230E-07 | 0.0002 |
| Pa-231 | 1.158E-05 | 0.0155 | 6.965E-09 | 0.3000 | 0.000E+00 | 0.0000 | 2.259E-06 | 0.0030 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.610E-07 | 0.0011 |
| Ra-226 | 3.862E-04 | 0.5153 | 2.558E-09 | 0.3000 | 0.000E+00 | 0.0000 | 7.115E-05 | 0.0949 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.960E-06 | 0.0066 |
| Ra-228 | 4.716E-05 | 0.0629 | 1.964E-09 | 0.3000 | 0.000E+00 | 0.0000 | 9.784E-06 | 0.0131 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.276E-07 | 0.0010 |
| Th-228 | 9.539E-06 | 0.0127 | 5.887E-10 | 0.3000 | 0.000E+00 | 0.0000 | 2.423E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.302E-08 | 0.0001 |
| Th-230 | 1.957E-06 | 0.0026 | 3.189E-09 | 0.3000 | 0.000E+00 | 0.0000 | 4.980E-07 | 0.0007 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.456E-07 | 0.0006 |
| Th-232 | 1.556E-04 | 0.2075 | 8.643E-09 | 0.3000 | 0.000E+00 | 0.0000 | 3.677E-05 | 0.0490 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.860E-06 | 0.0038 |
| U-235 | 3.253E-07 | 0.0011 | 5.125E-11 | 0.3000 | 0.000E+00 | 0.0000 | 1.721E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.562E-08 | 0.0000 |
| U-238 | 2.856E-06 | 0.0038 | 7.897E-10 | 0.3000 | 0.000E+00 | 0.0000 | 3.538E-07 | 0.0005 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.349E-07 | 0.0004 |
| Total | 5.182E-04 | 0.8247 | 2.592E-08 | 0.0000 | 0.000E+00 | 0.0000 | 1.210E-04 | 0.1614 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.039E-05 | 0.0139 |

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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+00 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Radon | | Plant | | Meat | | Milk | | All pathways | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|--------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 2.712E-06 | 0.0036 |
| Pa-231 | 0.000E+00 | 0.0000 | 1.471E-05 | 0.0196 |
| Ra-226 | 0.000E+00 | 0.0000 | 4.623E-04 | 0.6168 |
| Ra-228 | 0.000E+00 | 0.0000 | 5.767E-05 | 0.0769 |
| Th-228 | 0.000E+00 | 0.0000 | 9.627E-06 | 0.0128 |
| Th-230 | 0.000E+00 | 0.0000 | 2.904E-06 | 0.0039 |
| Th-232 | 0.000E+00 | 0.0000 | 1.952E-04 | 0.2604 |
| U-235 | 0.000E+00 | 0.0000 | 8.581E-07 | 0.0011 |
| U-238 | 0.000E+00 | 0.0000 | 3.546E-06 | 0.0047 |
| Total | 0.000E+00 | 0.0000 | 7.496E-04 | 1.0000 |

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As pCi/yr at t= 3.000E+00 years

| Radio-Nuclide | Water Independent Pathways (Inhalation w/o radon) | | | | | Water Dependent Pathways | | | | | Total Ingestion* |
|---------------|---|-----------|-----------|-----------|-----------|--------------------------|-----------|-----------|-----------|-----------|------------------|
| | Inhalation | Plant | Meat | Milk | Soil | Water | Fish | Plant | Meat | Milk | |
| Ac-227 | 4.507E-04 | 1.588E+01 | 0.000E+00 | C.000E+0C | 8.510E+0J | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.439E+01 |
| Pa-231 | 1.905E-03 | 2.647E+02 | 0.000E+00 | C.000E+0C | 3.597E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 3.006E+02 |
| Pb-210 | 4.608E-04 | 6.633E+01 | 0.000E+00 | C.000E+0C | 8.699E+03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.503E+01 |
| Ra-226 | 5.173E-03 | 2.874E+03 | 0.000E+00 | C.000E+0C | 9.767E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.972E+03 |
| Ra-228 | 1.796E-03 | 9.932E+02 | 0.000E+00 | C.000E+0C | 3.390E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.027E+03 |
| Th-228 | 1.892E-03 | 3.845E+01 | 0.000E+00 | C.000E+0C | 3.571E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.416E+01 |
| Th-230 | 3.717E-03 | 5.165E+01 | 0.000E+00 | C.000E+0C | 7.017E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.218E+02 |
| Th-232 | 2.012E-03 | 2.796E+01 | 0.000E+00 | C.000E+0C | 3.798E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.594E+01 |
| U-234 | 2.416E-08 | 8.392E-04 | 0.000E+00 | C.000E+0C | 4.562E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.295E-03 |
| U-235 | 1.701E-04 | 5.909E+00 | 0.000E+00 | C.000E+0C | 3.212E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 9.121E+00 |
| U-238 | 2.841E-03 | 9.868E+01 | 0.000E+00 | C.000E+0C | 5.364E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.523E+02 |

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
 and water-dependent water, fish, plant, meat, milk pathways

0 Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
 Radon and its Decay Products as pCi/yr at t= 3.000E+00 years

| Radon Pathway | Radionuclides | | | | | | | |
|---------------|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
| Water-ind. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Water-dep. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Total | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 3.000E+00 years

| Radio-Nuclide | Water Independent Pathways (Inhalation excludes radon) | | | | | | | | | | | |
|---------------|--|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | Ground | | Inhalation | | Plant | | Meat | | Milk | | Soil | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 1.246E-05 | 0.0165 | 5.925E-09 | 0.0000 | 6.483E-07 | 0.0009 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.227E-07 | 0.0008 |
| Pa-231 | 2.347E-06 | 0.0031 | 2.572E-09 | 0.0000 | 1.775E-06 | 0.0024 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.992E-07 | 0.0005 |
| Pb-210 | 7.975E-08 | 0.0001 | 8.705E-10 | 0.0000 | 3.022E-05 | 0.0401 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.150E-06 | 0.0042 |
| Ra-226 | 3.876E-04 | 0.5139 | 1.778E-09 | 0.0000 | 4.397E-05 | 0.0583 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.120E-06 | 0.0028 |
| Ra-228 | 7.871E-05 | 0.1044 | 3.055E-10 | 0.0000 | 4.632E-05 | 0.0614 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.521E-06 | 0.0033 |
| Th-228 | 1.344E-04 | 0.1782 | 8.294E-09 | 0.0000 | 5.085E-07 | 0.0007 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.878E-07 | 0.0012 |
| Th-230 | 2.764E-08 | 0.0000 | 3.177E-09 | 0.0000 | 1.844E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.252E-07 | 0.0006 |
| Th-232 | 6.281E-09 | 0.0000 | 2.613E-09 | 0.0000 | 1.116E-07 | 0.0001 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.632E-07 | 0.0003 |
| U-234 | 3.292E-13 | 0.0000 | 4.890E-14 | 0.0000 | 1.423E-11 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.280E-11 | 0.0000 |
| U-235 | 8.238E-07 | 0.0011 | 5.101E-11 | 0.0000 | 1.712E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.557E-08 | 0.0000 |
| U-238 | 2.852E-06 | 0.0038 | 7.885E-10 | 0.0000 | 3.533E-07 | 0.0005 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.344E-07 | 0.0004 |
| Total | 6.193E-04 | 0.8212 | 2.637E-08 | 0.0000 | 1.241E-04 | 0.1646 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.074E-05 | 0.0142 |

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 3.000E+00 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Plant | | Meat | | Milk | | All Pathways** | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|----------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 1.374E-05 | 0.0182 |
| Pa-231 | 0.000E+00 | 0.0000 | 4.523E-06 | 0.0060 |
| Pb-210 | 0.000E+00 | 0.0000 | 3.345E-05 | 0.0444 |
| Ra-226 | 0.000E+00 | 0.0000 | 4.337E-04 | 0.5751 |
| Ra-228 | 0.000E+00 | 0.0000 | 1.275E-04 | 0.1691 |
| Th-228 | 0.000E+00 | 0.0000 | 1.358E-04 | 0.1801 |
| Th-230 | 0.000E+00 | 0.0000 | 6.404E-07 | 0.0008 |
| Th-232 | 0.000E+00 | 0.0000 | 3.837E-07 | 0.0005 |
| U-234 | 0.000E+00 | 0.0000 | 2.740E-11 | 0.0000 |
| U-235 | 0.000E+00 | 0.0000 | 8.566E-07 | 0.0011 |
| U-238 | 0.000E+00 | 0.0000 | 3.541E-06 | 0.0047 |
| Total | 0.000E+00 | 0.0000 | 7.542E-04 | 1.0000 |

** Sum of water independent ground, inhalation, plant, meat, milk, soil
 and water dependent water, fish, plant, meat, milk pathways

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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
 Radon and its Decay Products at t= 3.000E+00 years
 Radionuclides

| Radon Pathway | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Water-ind. | 0.000E+00 |
| Water-dep. | 0.000E+00 |
| Total | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 3.000E+00 years

| Radio-Nuclide | Ground | | | | Inhalation | | | | Water Independent Pathways (Inhalation excludes radon) | | | | Soil | | | |
|---------------|-----------|--------|-----------|--------|------------|--------|-----------|--------|--|--------|-----------|--------|-----------|--------|------|--------|
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 2.301E-06 | 0.0031 | 1.094E-09 | 0.0000 | 0.000E+00 | 0.0000 | 1.189E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.150E-07 | 0.0002 | - | - |
| Pa-231 | 1.251E-05 | 0.0166 | 7.403E-09 | 0.0000 | 0.000E+00 | 0.0000 | 2.304E-06 | 0.0031 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.069E-07 | 0.0012 | - | - |
| Ra-226 | 3.855E-04 | 0.5112 | 2.635E-09 | 0.0000 | 0.000E+00 | 0.0000 | 7.382E-05 | 0.0979 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 5.246E-06 | 0.0070 | - | - |
| Ra-228 | 4.043E-05 | 0.0536 | 1.752E-09 | 0.0000 | 0.000E+00 | 0.0000 | 7.688E-06 | 0.0102 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 5.937E-07 | 0.0008 | - | - |
| Th-228 | 4.622E-06 | 0.0061 | 2.852E-10 | 0.0000 | 0.000E+00 | 0.0000 | 1.174E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.053E-08 | 0.0000 | - | - |
| Th-230 | 2.197B-06 | 0.0029 | 3.190E-09 | 0.0000 | 0.000E+00 | 0.0000 | 5.430E-07 | 0.0007 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.488E-07 | 0.0006 | - | - |
| Th-232 | 1.680E-04 | 0.2228 | 9.175E-09 | 0.0000 | 0.000E+00 | 0.0000 | 3.924E-05 | 0.0520 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.048E-06 | 0.0040 | - | - |
| U-235 | 8.241E-07 | 0.0011 | 5.120E-11 | 0.0000 | 0.000E+00 | 0.0000 | 1.720E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.560E-08 | 0.0000 | - | - |
| U-238 | 2.852E-06 | 0.0038 | 7.885E-10 | 0.0000 | 0.000E+00 | 0.0000 | 3.533E-07 | 0.0005 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.344E-07 | 0.0004 | - | - |
| Total | 6.193E-04 | 0.8212 | 2.637E-08 | 0.0000 | 0.000E+00 | 0.0000 | 1.241E-04 | 0.1646 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.074E-05 | 0.0142 | - | - |

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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 3.000E+00 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Radon | | Plant | | Meat | | Milk | | All pathways | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|--------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 2.536E-06 | 0.0034 |
| Pa-231 | 0.000E+00 | 0.0000 | 1.573E-05 | 0.0209 |
| Ra-226 | 0.000E+00 | 0.0000 | 4.646E-04 | 0.6160 |
| Ra-228 | 0.000E+00 | 0.0000 | 4.872E-05 | 0.0646 |
| Th-228 | 0.000E+00 | 0.0000 | 4.664E-06 | 0.0062 |
| Th-230 | 0.000E+00 | 0.0000 | 3.192E-06 | 0.0042 |
| Th-232 | 0.000E+00 | 0.0000 | 2.103E-04 | 0.2789 |
| U-235 | 0.000E+00 | 0.0000 | 8.570E-07 | 0.0011 |
| U-238 | 0.000E+00 | 0.0000 | 3.541E-06 | 0.0047 |
| Total | 0.000E+00 | 0.0000 | 7.542E-04 | 1.0000 |

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As pCi/yr at t= 1.000E+01 years

| Radio-Nuclide | Water Independent Pathways (Inhalation w/o radon) | | | | | Water Dependent Pathways | | | | | Total Ingestion* |
|---------------|---|-----------|-----------|-----------|-----------|--------------------------|-----------|-----------|-----------|-----------|------------------|
| | Inhalation | Plant | Meat | Milk | Soil | Water | Fish | Plant | Meat | Milk | |
| Ac-227 | 7.336E-04 | 2.570E+01 | 0.000E+00 | 0.000E+00 | 1.385E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 3.955E+01 |
| Pa-231 | 1.895E-03 | 2.633E+02 | 0.000E+00 | 0.000E+00 | 3.579E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.991E+02 |
| Pb-210 | 1.378E-03 | 1.937E+02 | 0.000E+00 | 0.000E+00 | 2.601E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.197E+02 |
| Ra-226 | 5.150E-03 | 2.861E+03 | 0.000E+00 | 0.000E+00 | 9.724E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.959E+03 |
| Ra-228 | 1.914E-03 | 1.059E+03 | 0.000E+00 | 0.000E+00 | 3.614E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.095E+03 |
| Th-228 | 1.886E-03 | 3.917E+01 | 0.000E+00 | 0.000E+00 | 3.560E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.477E+01 |
| Th-230 | 3.716E-03 | 5.165E+01 | 0.000E+00 | 0.000E+00 | 7.016E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.218E+02 |
| Th-232 | 2.012E-03 | 2.796E+01 | 0.000E+00 | 0.000E+00 | 3.798E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.594E+01 |
| U-234 | 8.013E-08 | 2.783E-03 | 0.000E+00 | 0.000E+00 | 1.513E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 4.296E-03 |
| U-235 | 1.693E-04 | 5.879E+00 | 0.000E+00 | 0.000E+00 | 3.196E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 9.075E+00 |
| U-238 | 2.827E-03 | 9.819E+01 | 0.000E+00 | 0.000E+00 | 5.337E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.516E+02 |

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
 and water-dependent water, fish, plant, meat, milk pathways

0 Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
 Radon and its Decay Products as pCi/yr at t= 1.000E+01 years

| Radon Pathway | Radionuclides | | | | | | | |
|---------------|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
| Water-ind. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E-00 | 0.000E+00 |
| Water-dep. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Total | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |

Water-ind. == Water-independent

Water-dep. == Water-dependent

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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+01 years

| Radio-Nuclide | Water Independent Pathways (Inhalation excludes radon) | | | | | | | | | | | |
|---------------|--|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | Ground | | Inhalation | | Plant | | Meat | | Milk | | Soil | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 1.476E-05 | 0.0192 | 7.019E-09 | 0.0000 | 7.672E-07 | 0.0010 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.376E-07 | 0.0010 |
| Pa-231 | 2.335E-06 | 0.0030 | 2.559E-09 | 0.0000 | 1.766E-06 | 0.0023 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.971E-07 | 0.0005 |
| Pb-210 | 1.021E-07 | 0.0001 | 1.114E-09 | 0.0000 | 3.862E-05 | 0.0503 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.033E-06 | 0.0052 |
| Ra-226 | 3.859E-04 | 0.5023 | 1.770E-09 | 0.0000 | 4.377E-05 | 0.0570 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.110E-06 | 0.0027 |
| Ra-228 | 7.999E-05 | 0.1041 | 3.105E-10 | 0.0000 | 4.708E-05 | 0.0613 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.562E-06 | 0.0033 |
| Th-228 | 1.365E-04 | 0.1777 | 8.426E-09 | 0.0000 | 5.166E-07 | 0.0007 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.020E-07 | 0.0012 |
| Th-230 | 2.764E-08 | 0.0000 | 3.177E-09 | 0.0000 | 1.844E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.251E-07 | 0.0006 |
| Th-232 | 6.281E-09 | 0.0000 | 2.613E-09 | 0.0000 | 1.116E-07 | 0.0001 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.632E-07 | 0.0003 |
| U-234 | 4.553E-13 | 0.0000 | 6.764E-14 | 0.0000 | 1.968E-11 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.770E-11 | 0.0000 |
| U-235 | 8.197E-07 | 0.0011 | 5.075E-11 | 0.0000 | 1.704E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.550E-08 | 0.0000 |
| U-238 | 2.838E-06 | 0.0037 | 7.846E-10 | 0.0000 | 3.515E-07 | 0.0005 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.327E-07 | 0.0004 |
| Total | 6.233E-04 | 0.8113 | 2.782E-08 | 0.0000 | 1.332E-04 | 0.1734 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.178E-05 | 0.0153 |

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+01 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Plant | | Meat | | Milk | | All Pathways** | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|----------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 1.627E-05 | 0.0212 |
| Pa-231 | 0.000E+00 | 0.0000 | 4.500E-06 | 0.0059 |
| Pb-210 | 0.000E+00 | 0.0000 | 4.276E-05 | 0.0557 |
| Ra-226 | 0.000E+00 | 0.0000 | 4.318E-04 | 0.5620 |
| Ra-228 | 0.000E+00 | 0.0000 | 1.296E-04 | 0.1687 |
| Th-228 | 0.000E+00 | 0.0000 | 1.379E-04 | 0.1796 |
| Th-230 | 0.000E+00 | 0.0000 | 6.403E-07 | 0.0008 |
| Th-232 | 0.000E+00 | 0.0000 | 3.837E-07 | 0.0005 |
| U-234 | 0.000E+00 | 0.0000 | 3.790E-11 | 0.0000 |
| U-235 | 0.000E+00 | 0.0000 | 8.523E-07 | 0.0011 |
| U-238 | 0.000E+00 | 0.0000 | 3.523E-06 | 0.0046 |
| Total | 0.000E+00 | 0.0000 | 7.683E-04 | 1.0000 |

** Sum of water independent ground, inhalation, plant, meat, milk, soil
 and water dependent water, fish, plant, meat, milk pathways

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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irr,i,t) for Inhalation of
 Radon and its Decay Products at t= 1.000E+01 years
 Radionuclides

| Radon Pathway | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Water-ind. | 0.000E+00 |
| Water-dep. | 0.000E+00 |
| Total | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+01 years

| Radio-Nuclide | Ground | | | | Inhalation | | | | Water Independent Pathways (Inhalation excludes radon) | | | | Soil | | | |
|---------------|-----------|--------|-----------|--------|------------|--------|-----------|--------|--|--------|-----------|--------|-----------|--------|------|--------|
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 1.819E-06 | 0.0024 | 8.647E-10 | 0.0000 | 0.000E+00 | 0.0000 | 9.399E-08 | 0.0001 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.087E-08 | 0.0001 | | |
| Pa-231 | 1.528E-05 | 0.0199 | 8.713E-09 | 0.0000 | 0.000E+00 | 0.0000 | 2.439E-06 | 0.0032 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.044E-06 | 0.0014 | | |
| Ra-226 | 3.830E-04 | 0.4985 | 2.865E-09 | 0.0000 | 0.000E+00 | 0.0000 | 8.186E-05 | 0.1066 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.107E-06 | 0.0079 | | |
| Ra-228 | 1.925E-05 | 0.0251 | 8.698E-10 | 0.0000 | 0.000E+00 | 0.0000 | 3.300E-06 | 0.0043 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.671E-07 | 0.0003 | | |
| Th-228 | 3.659E-07 | 0.0005 | 2.258E-11 | 0.0000 | 0.000E+00 | 0.0000 | 9.293E-10 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.417E-09 | 0.0000 | | |
| Th-230 | 3.033E-06 | 0.0039 | 3.196E-09 | 0.0000 | 0.000E+00 | 0.0000 | 7.126E-07 | 0.0009 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.611E-07 | 0.0006 | | |
| Th-232 | 1.969E-04 | 0.2563 | 1.046E-08 | 0.0000 | 0.000E+00 | 0.0000 | 4.441E-05 | 0.0578 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.458E-06 | 0.0045 | | |
| U-235 | 6.202E-07 | 0.0011 | 5.105E-11 | 0.0000 | 0.000E+00 | 0.0000 | 1.714E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.553E-08 | 0.0000 | | |
| U-238 | 2.838E-06 | 0.0037 | 7.846E-10 | 0.0000 | 0.000E+00 | 0.0000 | 3.515E-07 | 0.0005 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.327E-07 | 0.0004 | | |
| Total | 6.233E-04 | 0.8113 | 2.782E-08 | 0.0000 | 0.000E+00 | 0.0000 | 1.332E-04 | 0.1734 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.178E-05 | 0.0153 | | |

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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+01 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Radon | | Plant | | Meat | | Milk | | All pathways | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|--------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 2.004E-06 | 0.0026 |
| Pa-231 | 0.000E+00 | 0.0000 | 1.877E-05 | 0.0244 |
| Ra-226 | 0.000E+00 | 0.0000 | 4.710E-04 | 0.6130 |
| Ra-228 | 0.000E+00 | 0.0000 | 2.282E-05 | 0.0297 |
| Th-228 | 0.000E+00 | 0.0000 | 3.692E-07 | 0.0005 |
| Th-230 | 0.000E+00 | 0.0000 | 4.209E-06 | 0.0055 |
| Th-232 | 0.000E+00 | 0.0000 | 2.448E-04 | 0.3186 |
| U-235 | 0.000E+00 | 0.0000 | 8.529E-07 | 0.0011 |
| U-238 | 0.000E+00 | 0.0000 | 3.523E-06 | 0.0046 |
| Total | 0.000E+00 | 0.0000 | 7.683E-04 | 1.0000 |

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As pCi/yr at t= 7.000E+01 years

| Radio-Nuclide | Water Independent Pathways (Inhalation w/o radon) | | | | | Water Dependent Pathways | | | | | Total Ingestion* |
|---------------|---|-----------|-----------|-----------|-----------|--------------------------|-----------|-----------|-----------|-----------|------------------|
| | Inhalation | Plant | Meat | Milk | Soil | Water | Fish | Plant | Meat | Milk | |
| Ac-227 | 1.610E-03 | 5.613E+01 | 0.000E+00 | 0.000E+00 | 3.039E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 8.652E+01 |
| Pa-231 | 1.814E-03 | 2.520E+02 | 0.000E+00 | 0.000E+00 | 3.425E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.862E+02 |
| Pb-210 | 4.424E-03 | 6.168E+02 | 0.000E+00 | 0.000E+00 | 8.353E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.003E+02 |
| Ra-226 | 4.960E-03 | 2.756E+03 | 0.000E+00 | 0.000E+00 | 9.365E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.850E+03 |
| Ra-228 | 2.003E-03 | 1.108E+03 | 0.000E+00 | 0.000E+00 | 3.782E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.146E+03 |
| Th-228 | 2.003E-03 | 4.141E+01 | 0.000E+00 | 0.000E+00 | 3.782E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.923E+01 |
| Th-230 | 3.714E-03 | 5.162E+01 | 0.000E+00 | 0.000E+00 | 7.012E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.217E+02 |
| Th-232 | 2.012E-03 | 2.796E+01 | 0.000E+00 | 0.000E+00 | 3.798E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.594E+01 |
| U-234 | 5.374E-07 | 1.866E-02 | 0.000E+00 | 0.000E+00 | 1.015E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.881E-02 |
| U-235 | 1.622E-04 | 5.633E+00 | 0.000E+00 | 0.000E+00 | 3.062E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 8.694E+00 |
| U-238 | 2.708E-03 | 9.407E+01 | 0.000E+00 | 0.000E+00 | 5.113E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.452E+02 |

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
 and water-dependent water, fish, plant, meat, milk pathways

0 Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
 Radon and its Decay Products as pCi/yr at t= 7.000E+01 years

| Radon Pathway | Radionuclides | | | | | | | |
|---------------|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
| Water-ind. | 0.000E+00 | 0.000E+00 | 0.0COE+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Water-dep. | 0.000E+00 | 0.000E+00 | 0.0COE+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Total | 0.000E+00 | 0.000E+00 | 0.0COE+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 7.000E+01 years

| Radio-Nuclide | Water Independent Pathways (Inhalation excludes radon) | | | | | | | | | | | |
|---------------|--|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | Ground | | Inhalation | | Plant | | Meat | | Milk | | Soil | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 2.166E-05 | 0.0273 | 1.030E-08 | 0.0000 | 1.123E-06 | 0.0014 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.082E-06 | 0.0014 |
| Pa-231 | 2.234E-06 | 0.0028 | 2.449E-09 | 0.0000 | 1.690E-06 | 0.0021 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.800E-07 | 0.0005 |
| Pb-210 | 1.749E-07 | 0.0002 | 1.909E-09 | 0.0000 | 6.597E-05 | 0.0831 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.907E-06 | 0.0087 |
| Ra-226 | 3.717E-04 | 0.4682 | 1.705E-09 | 0.0000 | 4.217E-05 | 0.0531 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.033E-06 | 0.0026 |
| Ra-228 | 8.095E-05 | 0.1020 | 3.142E-10 | 0.0000 | 4.765E-05 | 0.0600 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.593E-06 | 0.0033 |
| Th-228 | 1.389E-04 | 0.1750 | 8.572E-09 | 0.0000 | 5.247E-07 | 0.0007 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.176E-07 | 0.0012 |
| Th-230 | 2.763E-08 | 0.0000 | 3.175E-09 | 0.0000 | 1.843E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.249E-07 | 0.0005 |
| Th-232 | 6.281E-09 | 0.0000 | 2.613E-09 | 0.0000 | 1.116E-07 | 0.0001 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.632E-07 | 0.0003 |
| U-234 | 1.485E-12 | 0.0000 | 2.206E-13 | 0.0000 | 6.420E-11 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 5.773E-11 | 0.0000 |
| U-235 | 7.853E-07 | 0.0010 | 4.862E-11 | 0.0000 | 1.632E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.485E-08 | 0.0000 |
| U-238 | 2.719E-06 | 0.0034 | 7.516E-10 | 0.0000 | 3.367E-07 | 0.0004 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.187E-07 | 0.0004 |
| Total | 6.192E-04 | 0.7799 | 3.183E-08 | 0.0000 | 1.598E-04 | 0.2012 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.493E-05 | 0.0188 |

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 7.000E+01 years

| Radio-Nuclide | Water Dependent Pathways | | | | | | | | | | | |
|---------------|--------------------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|----------------|--------|
| | Water | | Fish | | Plant | | Meat | | Milk | | All Pathways** | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.387E-05 | 0.0301 |
| Pa-231 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.306E-06 | 0.0054 |
| Pb-210 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.305E-05 | 0.0920 |
| Ra-226 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.159E-04 | 0.5239 |
| Ra-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.312E-04 | 0.1652 |
| Th-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.403E-04 | 0.1768 |
| Th-230 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.400E-07 | 0.0008 |
| Th-232 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.837E-07 | 0.0005 |
| U-234 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.236E-10 | 0.0000 |
| U-235 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.165E-07 | 0.0010 |
| U-238 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.375E-06 | 0.0043 |
| Total | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.939E-04 | 1.0000 |

** Sum of water independent ground, inhalation, plant, meat, milk, soil
 and water dependent water, fish, plant, meat, milk pathways

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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
 Radon and its Decay Products at t= 7.000E+01 years

| Radon Pathway | Radionuclides | | | | | | | |
|---------------|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
| Water-ind. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Water-dep. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Total | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 7.000E+01 years

| Radio-Nuclide | Water Independent Pathways (Inhalation excludes radon) | | | | | | | | | | | | | |
|---------------|--|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | Ground | | Inhalation | | Radon | | Plant | | Meat | | Milk | | Soil | |
| risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | |
| Ac-227 | 2.421E-07 | 0.0003 | 1.151E-10 | 0.0000 | 0.000E+00 | 0.0000 | 1.251E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.210E-08 | 0.0000 |
| Pa-231 | 2.365E-05 | 0.0298 | 1.263E-08 | 0.0000 | 0.000E+00 | 0.0000 | 2.800E-06 | 0.0035 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.450E-06 | 0.0018 |
| Ra-226 | 3.620E-04 | 0.4559 | 3.533E-09 | 0.0000 | 0.000E+00 | 0.0000 | 1.058E-04 | 0.1332 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.757E-06 | 0.0110 |
| Ra-228 | 1.379E-08 | 0.0000 | 6.282E-13 | 0.0000 | 0.000E+00 | 0.0000 | 2.313E-09 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.892E-10 | 0.0000 |
| Th-228 | 1.325E-16 | 0.0000 | 8.177E-21 | 0.0000 | 0.000E+00 | 0.0000 | 3.365E-19 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.754E-19 | 0.0000 |
| Th-230 | 9.970E-06 | 0.0126 | 3.256E-09 | 0.0000 | 0.000E+00 | 0.0000 | 2.544E-06 | 0.0032 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.081E-07 | 0.0008 |
| Th-232 | 2.198E-04 | 0.2769 | 1.150E-08 | 0.0000 | 0.000E+00 | 0.0000 | 4.828E-05 | 0.0608 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.774E-06 | 0.0048 |
| U-235 | 7.881E-07 | 0.0010 | 5.018E-11 | 0.0000 | 0.000E+00 | 0.0000 | 1.672E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.503E-08 | 0.0000 |
| U-238 | 2.719E-06 | 0.0034 | 7.518E-10 | 0.0000 | 0.000E+00 | 0.0000 | 3.368E-07 | 0.0004 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.188E-07 | 0.0004 |
| Total | 6.192E-04 | 0.7799 | 3.183E-08 | 0.0000 | 0.000E+00 | 0.0000 | 1.598E-04 | 0.2012 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.493E-05 | 0.0188 |

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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 7.000E+01 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Radon | | Plant | | Meat | | Milk | | All pathways | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|--------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 2.669E-07 | 0.0003 |
| Pa-231 | 0.000E+00 | 0.0000 | 2.791E-05 | 0.0352 |
| Ra-226 | 0.000E+00 | 0.0000 | 4.765E-04 | 0.6002 |
| Ra-228 | 0.000E+00 | 0.0000 | 1.630E-08 | 0.0000 |
| Th-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.00CE+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.337E-16 | 0.0000 |
| Th-230 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.00CE+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.313E-05 | 0.0165 |
| Th-232 | 0.000E+00 | 0.0000 | 2.719E-04 | 0.3425 |
| U-235 | 0.000E+00 | 0.0000 | 8.199E-07 | 0.0010 |
| U-238 | 0.000E+00 | 0.0000 | 3.375E-06 | 0.0043 |
| Total | 0.000E+00 | 0.0000 | 7.939E-04 | 1.0000 |

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As pCi/yr at t= 1.000E+02 years

| Radio-Nuclide | Water Independent Pathways (Inhalation w/o radon) | | | | | Water Dependent Pathways | | | | | Total Ingestion* |
|---------------|---|-----------|-----------|-----------|-----------|--------------------------|-----------|-----------|-----------|-----------|------------------|
| | Inhalation | Plant | Meat | Milk | Soil | Water | Fish | Plant | Meat | Milk | |
| Ac-227 | 1.665E-03 | 5.803E+01 | 0.000E+00 | 0.000E+00 | 3.143E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 8.946E+01 |
| Pa-231 | 1.774E-03 | 2.465E+02 | 0.000E+00 | 0.000E+00 | 3.350E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.800E+02 |
| Pb-210 | 4.685E-03 | 6.530E+02 | 0.000E+00 | 0.000E+00 | 8.846E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.415E+02 |
| Ra-226 | 4.869E-03 | 2.705E+03 | 0.000E+00 | 0.000E+00 | 9.193E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.797E+03 |
| Ra-228 | 2.003E-03 | 1.108E+03 | 0.000E+00 | 0.000E+00 | 3.782E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.146E+03 |
| Th-228 | 2.003E-03 | 4.141E+01 | 0.000E+00 | 0.000E+00 | 3.782E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.923E+01 |
| Th-230 | 3.713E-03 | 5.161E+01 | 0.000E+00 | 0.000E+00 | 7.010E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.217E+02 |
| Th-232 | 2.012E-03 | 2.796E+01 | 0.000E+00 | 0.000E+00 | 3.798E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.594E+01 |
| U-234 | 7.513E-07 | 2.610E-02 | 0.000E+00 | 0.000E+00 | 1.419E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 4.028E-02 |
| U-235 | 1.587E-04 | 5.513E+00 | 0.000E+00 | 0.000E+00 | 2.997E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 8.510E+00 |
| U-238 | 2.651E-03 | 9.207E+01 | 0.000E+00 | 0.000E+00 | 5.005E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.421E+02 |

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
 and water-dependent water, fish, plant, meat, milk pathways

0 Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
 Radon and its Decay Products as pCi/yr at t= 1.000E+02 years

| Radon Pathway | Radionuclides | | | | | | | |
|---------------|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
| Water-ind. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Water-dep. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Total | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |

Water-ind. == Water-independent

Water-dep. == Water-dependent

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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+02 years

| Radio-Nuclide | Ground | | Inhalation | | Plant | | Meat | | Milk | | Soil | |
|---------------|-----------|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 2.193E-05 | 0.0278 | 1.043E-08 | 0.0000 | 1.137E-06 | 0.0014 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.096E-06 | 0.0014 |
| Pa-231 | 2.185E-06 | 0.0028 | 2.395E-09 | 0.0000 | 1.653E-06 | 0.0021 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.718E-07 | 0.0005 |
| Pb-210 | 1.801E-07 | 0.0002 | 1.966E-09 | 0.0000 | 6.794E-05 | 0.0861 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.115E-06 | 0.0090 |
| Ra-226 | 3.649E-04 | 0.4628 | 1.674E-09 | 0.0000 | 4.140E-05 | 0.0525 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.996E-06 | 0.0025 |
| Ra-228 | 8.095E-05 | 0.1026 | 3.142E-10 | 0.0000 | 4.765E-05 | 0.0604 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.593E-06 | 0.0033 |
| Th-228 | 1.389E-04 | 0.1761 | 8.572E-09 | 0.0000 | 5.247E-07 | 0.0007 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.176E-07 | 0.0012 |
| Th-230 | 2.762E-08 | 0.0000 | 3.174E-09 | 0.0000 | 1.842E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.248E-07 | 0.0005 |
| Th-232 | 6.281E-09 | 0.0000 | 2.613E-09 | 0.0000 | 1.116E-07 | 0.0001 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.632E-07 | 0.0003 |
| U-234 | 1.967E-12 | 0.0000 | 2.922E-13 | 0.0000 | 8.502E-11 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.646E-11 | 0.0000 |
| U-235 | 7.686E-07 | 0.0010 | 4.759E-11 | 0.0000 | 1.598E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.453E-08 | 0.0000 |
| U-238 | 2.661E-06 | 0.0034 | 7.357E-10 | 0.0000 | 3.296E-07 | 0.0004 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.120E-07 | 0.0004 |
| Total | 6.126E-04 | 0.7767 | 3.192E-08 | 0.0000 | 1.609E-04 | 0.2041 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.510E-05 | 0.0192 |

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+02 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Plant | | Meat | | Milk | | All Pathways** | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|----------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 2.417E-05 | 0.0307 |
| Pa-231 | 0.000E+00 | 0.0000 | 4.212E-06 | 0.0053 |
| Pb-210 | 0.000E+00 | 0.0000 | 7.523E-05 | 0.0954 |
| Ra-226 | 0.000E+00 | 0.0000 | 4.083E-04 | 0.5178 |
| Ra-228 | 0.000E+00 | 0.0000 | 1.312E-04 | 0.1664 |
| Th-228 | 0.000E+00 | 0.0000 | 1.403E-04 | 0.1780 |
| Th-230 | 0.000E+00 | 0.0000 | 6.398E-07 | 0.0008 |
| Th-232 | 0.000E+00 | 0.0000 | 3.836E-07 | 0.0005 |
| U-234 | 0.000E+00 | 0.0000 | 1.637E-10 | 0.0000 |
| U-235 | 0.000E+00 | 0.0000 | 7.992E-07 | 0.0010 |
| U-238 | 0.000E+00 | 0.0000 | 3.303E-06 | 0.0042 |
| Total | 0.000E+00 | 0.0000 | 7.886E-04 | 1.0000 |

** Sum of water independent ground, inhalation, plant, meat, milk, soil
 and water dependent water, fish, plant, meat, milk pathways

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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
 Radon and its Decay Products at t= 1.000E+02 years
 Radionuclides

| Radon Pathway | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Water-ind. | 0.000E+00 |
| Water-dep. | 0.000E+00 |
| Total | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+02 years

| Radio-Nuclide | Ground | | Inhalation | | Radon | | Plant | | Meat | | Milk | | Soil | |
|---------------|-----------|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 8.835E-08 | 0.0001 | 4.200E-11 | 0.0000 | 0.000E+00 | 0.0000 | 4.566E-09 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.414E-09 | 0.0000 |
| Pa-231 | 2.402E-05 | 0.0305 | 1.278E-08 | 0.0000 | 0.000E+00 | 0.0000 | 2.785E-06 | 0.0035 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.463E-06 | 0.0019 |
| Ra-226 | 3.519E-04 | 0.4462 | 3.526E-09 | 0.0000 | 0.000E+00 | 0.0000 | 1.060E-04 | 0.1344 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.845E-06 | 0.0112 |
| Ra-228 | 3.651E-10 | 0.0000 | 1.663E-14 | 0.0000 | 0.000E+00 | 0.0000 | 6.121E-11 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 5.008E-12 | 0.0000 |
| Th-228 | 2.521E-21 | 0.0000 | 1.556E-25 | 0.0000 | 0.000E+00 | 0.0000 | 6.404E-24 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.666E-23 | 0.0000 |
| Th-230 | 1.329E-05 | 0.0169 | 3.288E-09 | 0.0000 | 0.000E+00 | 0.0000 | 3.532E-06 | 0.0045 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.902E-07 | 0.0009 |
| Th-232 | 2.199E-04 | 0.2788 | 1.150E-08 | 0.0000 | 0.000E+00 | 0.0000 | 4.828E-05 | 0.0612 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.774E-06 | 0.0048 |
| U-235 | 7.727E-07 | 0.0010 | 4.983E-11 | 0.0000 | 0.000E+00 | 0.0000 | 1.652E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.479E-08 | 0.0000 |
| U-238 | 2.661E-06 | 0.0034 | 7.360E-10 | 0.0000 | 0.000E+00 | 0.0000 | 3.297E-07 | 0.0004 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.120E-07 | 0.0004 |
| Total | 6.126E-04 | 0.7767 | 3.192E-08 | 0.0000 | 0.000E+00 | 0.0000 | 1.609E-04 | 0.2041 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.510E-05 | 0.0192 |

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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+02 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Radon | | Plant | | Meat | | Milk | | All pathways | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|--------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 9.737E-08 | 0.0001 |
| Pa-231 | 0.000E+00 | 0.0000 | 2.828E-05 | 0.0359 |
| Ra-226 | 0.000E+00 | 0.0000 | 4.667E-04 | 0.5918 |
| Ra-228 | 0.000E+00 | 0.0000 | 4.313E-10 | 0.0000 |
| Th-228 | 0.000E+00 | 0.0000 | 2.545E-21 | 0.0000 |
| Th-230 | 0.000E+00 | 0.0000 | 1.752E-05 | 0.0222 |
| Th-232 | 0.000E+00 | 0.0000 | 2.719E-04 | 0.3448 |
| U-235 | 0.000E+00 | 0.0000 | 8.041E-07 | 0.0010 |
| U-238 | 0.000E+00 | 0.0000 | 3.304E-06 | 0.0042 |
| Total | 0.000E+00 | 0.0000 | 7.886E-04 | 1.0000 |

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As pCi/yr at t= 3.000E+02 years

| Radio-Nuclide | Water Independent Pathways (Inhalation w/o radon) | | | | | Water Dependent Pathways | | | | | Total Ingestion* |
|---------------|---|-----------|-----------|-----------|-----------|--------------------------|-----------|-----------|-----------|-----------|------------------|
| | Inhalation | Plant | Meat | Milk | Soil | Water | Fish | Plant | Meat | Milk | |
| Ac-227 | 1.484E-03 | 5.171E+01 | 0.000E+00 | 0.000E+00 | 2.801E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.972E+01 |
| Pa-231 | 1.532E-03 | 2.128E+02 | 0.000E+00 | 0.000E+00 | 2.893E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.417E+02 |
| Pb-210 | 4.355E-03 | 6.068E+02 | 0.000E+00 | 0.000E+00 | 8.222E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.890E+02 |
| Ra-226 | 4.324E-03 | 2.402E+03 | 0.000E+00 | 0.000E+00 | 8.164E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.484E+03 |
| Ra-228 | 2.003E-03 | 1.108E+03 | 0.000E+00 | 0.000E+00 | 3.782E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.146E+03 |
| Th-228 | 2.003E-03 | 4.140E+01 | 0.000E+00 | 0.000E+00 | 3.782E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.922E+01 |
| Th-230 | 3.706E-03 | 5.151E+01 | 0.000E+00 | 0.000E+00 | 6.997E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.215E+02 |
| Th-232 | 2.011E-03 | 2.796E+01 | 0.000E+00 | 0.000E+00 | 3.798E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.593E+01 |
| U-234 | 1.953E-06 | 6.784E-02 | 0.000E+00 | 0.000E+00 | 3.688E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.047E-01 |
| U-235 | 1.376E-04 | 4.779E+00 | 0.000E+00 | 0.000E+00 | 2.598E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.377E+00 |
| U-238 | 2.298E-03 | 7.981E+01 | 0.000E+00 | 0.000E+00 | 4.338E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.232E+02 |

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
 and water-dependent water, fish, plant, meat, milk pathways

0 Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
 Radon and its Decay Products as pCi/yr at t= 3.000E+02 years

| Radon Pathway | Radionuclides | | | | | | | |
|---------------|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
| Water-ind. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Water-dep. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Total | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |

Water-ind. == Water-independent

Water-dep. == Water-dependent

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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 3.000E+02 years

| Radio-Nuclide | Water Independent Pathways (Inhalation excludes radon) | | | | | | | | | | | |
|---------------|--|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | Ground | | Inhalation | | Plant | | Meat | | Milk | | Soil | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 1.932E-05 | 0.0264 | 9.186E-09 | 0.0000 | 1.002E-06 | 0.0014 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.653E-07 | 0.0013 |
| Pa-231 | 1.887E-06 | 0.0026 | 2.068E-09 | 0.0000 | 1.427E-06 | 0.0019 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.210E-07 | 0.0004 |
| Pb-210 | 1.648E-07 | 0.0002 | 1.799E-09 | 0.0000 | 6.214E-05 | 0.0848 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.508E-06 | 0.0089 |
| Ra-226 | 3.243E-04 | 0.4426 | 1.487E-09 | 0.0000 | 3.678E-05 | 0.0502 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.773E-06 | 0.0024 |
| Ra-228 | 8.094E-05 | 0.1105 | 3.142E-10 | 0.0000 | 4.764E-05 | 0.0650 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.593E-06 | 0.0035 |
| Th-228 | 1.389E-04 | 0.1896 | 8.571E-09 | 0.0000 | 5.246E-07 | 0.0007 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.175E-07 | 0.0013 |
| Th-230 | 2.757E-08 | 0.0000 | 3.168E-09 | 0.0000 | 1.839E-07 | 0.0003 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.240E-07 | 0.0006 |
| Th-232 | 6.280E-09 | 0.0000 | 2.613E-09 | 0.0000 | 1.115E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.632E-07 | 0.0004 |
| U-234 | 4.670E-12 | 0.0000 | 6.938E-13 | 0.0000 | 2.019E-10 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.816E-10 | 0.0000 |
| U-235 | 6.663E-07 | 0.0009 | 4.125E-11 | 0.0000 | 1.385E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.260E-08 | 0.0000 |
| U-238 | 2.307E-06 | 0.0031 | 6.377E-10 | 0.0000 | 2.857E-07 | 0.0004 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.704E-07 | 0.0004 |
| Total | 5.685E-04 | 0.7759 | 2.989E-08 | 0.0000 | 1.501E-04 | 0.2049 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.405E-05 | 0.0192 |

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 3.000E+02 years

Water Dependent Pathways

| Radio-Nuclide | Water Dependent Pathways | | | | | | | | | | | |
|---------------|--------------------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|----------------|--------|
| | Water | | Fish | | Plant | | Meat | | Milk | | All Pathways** | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.130E-05 | 0.0291 |
| Pa-231 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.637E-06 | 0.0050 |
| Pb-210 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.882E-05 | 0.0939 |
| Ra-226 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.628E-04 | 0.4952 |
| Ra-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.312E-04 | 0.1790 |
| Th-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.403E-04 | 0.1915 |
| Th-230 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.385E-07 | 0.0009 |
| Th-232 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.836E-07 | 0.0005 |
| U-234 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.888E-10 | 0.0000 |
| U-235 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.928E-07 | 0.0009 |
| U-238 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.863E-06 | 0.0039 |
| Total | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.327E-04 | 1.0000 |

** Sum of water independent ground, inhalation, plant, meat, milk, soil
 and water dependent water, fish, plant, meat, milk pathways

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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
 Radon and its Decay Products at t= 3.000E+02 years

| Radon Pathway | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Water-ind. | 0.000E+00 |
| Water-dep. | 0.000E+00 |
| Total | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 3.000E+02 years

| Radio-Nuclide | Ground | | | | Inhalation | | | | Water Independent Pathways (Inhalation excludes radon) | | | | Soil | | | |
|---------------|-----------|--------|-----------|--------|------------|--------|-----------|--------|--|--------|-----------|--------|-----------|--------|------|--------|
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 1.064E-10 | 0.0000 | 5.061E-14 | 0.0000 | 0.000E+00 | 0.0000 | 5.501E-12 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 5.319E-12 | 0.0000 | | |
| Pa-231 | 2.120E-05 | 0.0289 | 1.125E-08 | 0.0000 | 0.000E+00 | 0.0000 | 2.428E-06 | 0.0033 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.286E-06 | 0.0018 | | |
| Ra-226 | 2.913E-04 | 0.3976 | 2.970E-09 | 0.0000 | 0.000E+00 | 0.0000 | 8.949E-05 | 0.1221 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.506E-06 | 0.0102 | | |
| Ra-228 | 1.116E-20 | 0.0000 | 5.081E-25 | 0.0000 | 0.000E+00 | 0.0000 | 1.870E-21 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.530E-22 | 0.0000 | | |
| Th-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | | |
| Th-230 | 3.317E-05 | 0.0453 | 3.484E-09 | 0.0000 | 0.000E+00 | 0.0000 | 9.619E-06 | 0.0131 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.200E-06 | 0.0016 | | |
| Th-232 | 2.198E-04 | 0.3000 | 1.150E-08 | 0.0000 | 0.000E+00 | 0.0000 | 4.828E-05 | 0.0659 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.774E-06 | 0.0052 | | |
| U-235 | 6.778E-07 | 0.0009 | 4.744E-11 | 0.0000 | 0.000E+00 | 0.0000 | 1.524E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.331E-08 | 0.0000 | | |
| U-238 | 2.307E-06 | 0.0031 | 6.384E-10 | 0.0000 | 0.000E+00 | 0.0000 | 2.859E-07 | 0.0004 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.706E-07 | 0.0004 | | |
| Total | 5.685E-04 | 0.7759 | 2.989E-08 | 0.0000 | 0.000E+00 | 0.0000 | 1.501E-04 | 0.2049 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.405E-05 | 0.0192 | | |

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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 3.000E+02 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Radon | | Plant | | Meat | | Milk | | All pathways | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|--------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 1.173E-10 | 0.0000 |
| Pa-231 | 0.000E+00 | 0.0000 | 2.492E-05 | 0.0340 |
| Ra-226 | 0.000E+00 | 0.0000 | 3.883E-04 | 0.5300 |
| Ra-228 | 0.000E+00 | 0.0000 | 1.318E-20 | 0.0000 |
| Th-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 |
| Th-230 | 0.000E+00 | 0.0000 | 4.399E-05 | 0.0600 |
| Th-232 | 0.000E+00 | 0.0000 | 2.719E-04 | 0.3711 |
| U-235 | 0.000E+00 | 0.0000 | 7.064E-07 | 0.0010 |
| U-238 | 0.000E+00 | 0.0000 | 2.864E-06 | 0.0039 |
| Total | 0.000E+00 | 0.0000 | 7.327E-04 | 1.0000 |

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

1RESRAD, Version 6.5 T_{1/2} Limit = 180 days 08/06/2012 11:48 Page 33
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As pCi/yr at t= 1.000E+03 years

| Radio-Nuclide | Water Independent Pathways (Inhalation w/c radon) | | | | | Water Dependent Pathways | | | | | Total Ingestion* |
|---------------|---|-----------|-----------|-----------|-----------|--------------------------|-----------|-----------|-----------|-----------|------------------|
| | Inhalation | Plant | Meat | Milk | Soil | Water | Fish | Plant | Meat | Milk | |
| Ac-227 | 8.876E-04 | 3.094E+01 | 0.000E+00 | 0.000E+00 | 1.676E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 4.770E+01 |
| Pa-231 | 9.166E-04 | 1.273E+02 | 0.000E+00 | 0.000E+00 | 1.730E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.446E+02 |
| Pb-210 | 3.058E-03 | 4.262E+02 | 0.000E+00 | 0.000E+00 | 5.774E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 4.839E+02 |
| Ra-226 | 3.051E-03 | 1.695E+03 | 0.000E+00 | 0.000E+00 | 5.761E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.753E+03 |
| Ra-228 | 2.002E-03 | 1.108E+03 | 0.000E+00 | 0.000E+00 | 3.780E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.146E+03 |
| Th-228 | 2.002E-03 | 4.139E+01 | 0.000E+00 | 0.000E+00 | 3.780E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.919E+01 |
| Th-230 | 3.681E-03 | 5.116E+01 | 0.000E+00 | 0.000E+00 | 6.950E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.207E+02 |
| Th-232 | 2.011E-03 | 2.794E+01 | 0.000E+00 | 0.000E+00 | 3.796E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.590E+01 |
| U-234 | 3.944E-06 | 1.370E-01 | 0.000E+00 | 0.000E+00 | 7.446E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.114E-01 |
| U-235 | 8.343E-05 | 2.898E+00 | 0.000E+00 | 0.000E+00 | 1.575E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 4.473E+00 |
| U-238 | 1.393E-03 | 4.839E+01 | 0.000E+00 | 0.000E+00 | 2.630E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.470E+01 |

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
 and water-dependent water, fish, plant, meat, milk pathways

0 Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
 Radon and its Decay Products as pCi/yr at t= 1.000E+03 years

| Radon Pathway | Radionuclides | | | | | | | |
|---------------|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
| Water-ind. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Water-dep. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Total | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

| Radio-Nuclide | Water Independent Pathways (Inhalation excludes radon) | | | | | | | | | | | |
|---------------|--|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | Ground | | Inhalation | | Plant | | Meat | | Milk | | Soil | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 1.156E-05 | 0.0194 | 5.495E-09 | 0.0000 | 5.994E-07 | 0.0010 | 0.000E+00 | 0.0000 | 0.00CE+00 | 0.0000 | 5.775E-07 | 0.0010 |
| Pa-231 | 1.129E-06 | 0.0019 | 1.237E-09 | 0.0000 | 8.538E-07 | 0.0014 | 0.000E+00 | 0.0000 | 0.00CE+00 | 0.0000 | 1.920E-07 | 0.0003 |
| Pb-210 | 1.160E-07 | 0.0002 | 1.266E-09 | 0.0000 | 4.374E-05 | 0.0736 | 0.000E+00 | 0.0000 | 0.00CE+00 | 0.0000 | 4.581E-06 | 0.0077 |
| Ra-226 | 2.294E-04 | 0.3858 | 1.052E-09 | 0.0000 | 2.602E-05 | 0.0438 | 0.000E+00 | 0.0000 | 0.00CE+00 | 0.0000 | 1.254E-06 | 0.0021 |
| Ra-228 | 8.091E-05 | 0.1361 | 3.141E-10 | 0.0000 | 4.762E-05 | 0.0801 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.592E-06 | 0.0044 |
| Th-228 | 1.388E-04 | 0.2335 | 8.567E-09 | 0.0000 | 5.244E-07 | 0.0009 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.171E-07 | 0.0015 |
| Th-230 | 2.738E-08 | 0.0000 | 3.147E-09 | 0.0000 | 1.826E-07 | 0.0003 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.211E-07 | 0.0007 |
| Th-232 | 6.277E-09 | 0.0000 | 2.612E-09 | 0.0000 | 1.115E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.631E-07 | 0.0004 |
| U-234 | 9.117E-12 | 0.0000 | 1.354E-12 | 0.0000 | 3.941E-10 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.544E-10 | 0.0000 |
| U-235 | 4.040E-07 | 0.0007 | 2.501E-11 | 0.0000 | 8.398E-09 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.637E-09 | 0.0000 |
| U-238 | 1.399E-06 | 0.0024 | 3.867E-10 | 0.0000 | 1.732E-07 | 0.0003 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.640E-07 | 0.0003 |
| Total | 4.637E-04 | 0.7800 | 2.410E-08 | 0.0000 | 1.198E-04 | 0.2015 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.097E-05 | 0.0185 |

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.00E+03 years

Water Dependent Pathways

| Radio-Nuclide | Water Dependent Pathways | | | | | | | | | | | |
|---------------|--------------------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|----------------|--------|
| | Water | | Fish | | Plant | | Meat | | Milk | | All Pathways** | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.274E-05 | 0.0214 |
| Pa-231 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.176E-06 | 0.0037 |
| Pb-210 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.844E-05 | 0.0815 |
| Ra-226 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.566E-04 | 0.4316 |
| Ra-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.311E-04 | 0.2205 |
| Th-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.403E-04 | 0.2359 |
| Th-230 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.343E-07 | 0.0011 |
| Th-232 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.834E-07 | 0.0006 |
| U-234 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.590E-10 | 0.0000 |
| U-235 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.201E-07 | 0.0007 |
| U-238 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.736E-06 | 0.0029 |
| Total | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 5.946E-04 | 1.0000 |

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
 Radon and its Decay Products at t= 1.000E+03 years
 Radionuclides

| Radon Pathway | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Water-ind. | 0.000E+00 |
| Water-dep. | 0.000E+00 |
| Total | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+03 years

| Radio-Nuclide | Ground | | Inhalation | | Radon | | Plant | | Meat | | Milk | | Soil | |
|---------------|-----------|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 6.463E-21 | 0.0000 | 3.073E-24 | 0.0000 | 0.000E+00 | 0.0000 | 3.340E-22 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.229E-22 | 0.0000 |
| Pa-231 | 1.266E-05 | 0.0213 | 6.720E-09 | 0.0000 | 0.000E+00 | 0.0000 | 1.450E-06 | 0.0024 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.681E-07 | 0.0013 |
| Ra-226 | 1.504E-04 | 0.2529 | 1.533E-09 | 0.0000 | 0.000E+00 | 0.0000 | 4.620E-05 | 0.0777 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.875E-06 | 0.0065 |
| Ra-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 |
| Th-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 |
| Th-230 | 7.912E-05 | 0.1331 | 3.932E-09 | 0.0000 | 0.000E+00 | 0.0000 | 2.374E-05 | 0.0399 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.381E-06 | 0.0040 |
| Th-232 | 2.197E-04 | 0.3696 | 1.149E-08 | 0.0000 | 0.000E+00 | 0.0000 | 4.826E-05 | 0.0812 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.772E-06 | 0.0063 |
| U-235 | 4.279E-07 | 0.0007 | 3.772E-11 | 0.0000 | 0.000E+00 | 0.0000 | 1.117E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.092E-09 | 0.0000 |
| U-238 | 1.399E-06 | 0.0024 | 3.880E-10 | 0.0000 | 0.000E+00 | 0.0000 | 1.737E-07 | 0.0003 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.643E-07 | 0.0003 |
| Total | 4.637E-04 | 0.7800 | 2.410E-08 | 0.0000 | 0.000E+00 | 0.0000 | 1.198E-04 | 0.2015 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.097E-05 | 0.0185 |

1RESRAD, Version 6.5 $T_{\frac{1}{2}}$ Limit = 180 days 08/06/2012 11:48 Page 36
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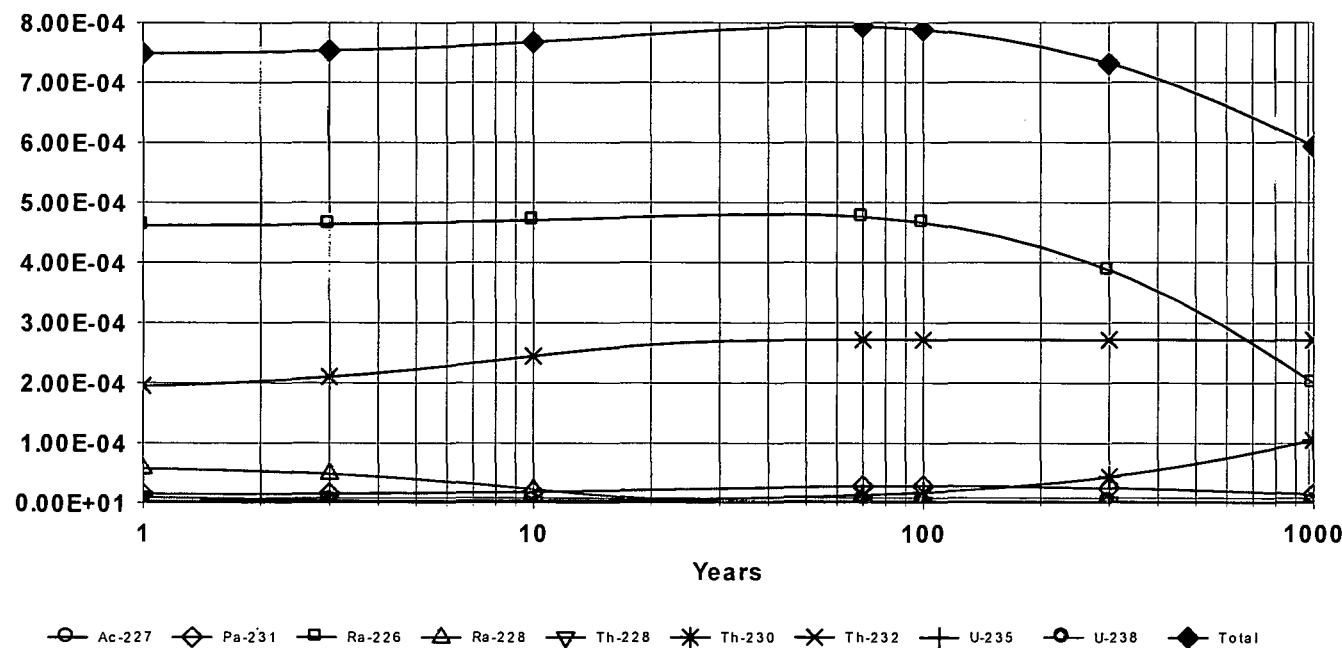
Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at $t = 1.000E+03$ years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Radon | | Plant | | Meat | | Milk | | All pathways | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|--------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 7.123E-21 | 0.0000 |
| Pa-231 | 0.000E+00 | 0.0000 | 1.489E-05 | 0.0250 |
| Ra-226 | 0.000E+00 | 0.0000 | 2.005E-04 | 0.3372 |
| Ra-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 |
| Th-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 |
| Th-230 | 0.000E+00 | 0.0000 | 1.052E-04 | 0.1770 |
| Th-232 | 0.000E+00 | 0.0000 | 2.718E-04 | 0.4571 |
| U-235 | 0.000E+00 | 0.0000 | 4.482E-07 | 0.0008 |
| U-238 | 0.000E+00 | 0.0000 | 1.737E-06 | 0.0029 |
| Total | 0.000E+00 | 0.0000 | 5.946E-04 | 1.0000 |

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

EXCESS CANCER RISK: All Nuclides Summed, All Pathways Summed



C:\RESRAD_FAMILY\RESRAD6.5\USERFILES\BACKGROUND ACC RESIDENT RI FINAL.RAD 08/06/2012 11:48 GRAPHICS.ASC Includes All Pathways

Attachment C

**RESRAD Output for Average Background Cancer Risks Calculated for Hypothetical
Resident Gardener Exposures to Inaccessible Soil**

1RESRAD, Version 6.5 T_½ Limit = 180 days 12/04/2013 15:00 Page 1
Intrinsic : SLDS Mean Background_ISOU Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\BKGD MEAN ISOU RESIDENT.RAD

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Part III: Intake Quantities and Health Risk Factors

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|---|----|
| Cancer Risk Slope Factors | 2 |
| Risk Slope and ETRG for the Ground Pathway | 4 |
| Amount of Intake Quantities and Excess Cancer Risks | |
| Time= 0.000E+00 | 5 |
| Time= 1.000E+00 | 8 |
| Time= 3.000E+00 | 11 |
| Time= 1.000E+01 | 14 |
| Time= 7.000E+01 | 17 |
| Time= 1.000E+02 | 20 |
| Time= 3.000E+02 | 23 |
| Time= 1.000E+03 | 26 |

1RESRAD, Version 6.5 T_½ Limit = 180 days 12/04/2013 15:00 Page 2
Intrinsic : SLDS Mean Background_ISOU Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\BKGD MEAN ISOU RESIDENT.RAD

Cancer Risk Slope Factors Summary Table
Risk Library: HEAST 2001 Morbidity

| 0 Menu | Parameter | Current Value | Base Case* | Parameter Name |
|-----------|--|------------------|---------------|-------------------|
| Sf-1 | Ground external radiation slope factors, 1/yr per (pCi/g): | | | |
| Sf-1 | Ac-227+D | 1.47E-06 | 3.48E-10 | SLPF(1,1) |
| Sf-1 | Pa-231 | 1.39E-07 | 1.39E-07 | SLPF(2,1) |
| Sf-1 | Pb-210+D | 4.21E-09 | 1.41E-09 | SLPF(3,1) |
| Sf-1 | Ra-226+D | 8.49E-06 | 2.29E-08 | SLPF(4,1) |
| Sf-1 | Ra-228+D | 4.53E-06 | 0.00E+00 | SLPF(5,1) |
| Sf-1 | Th-228+D | 7.76E-06 | 5.59E-09 | SLPF(6,1) |
| Sf-1 | Th-230 | 8.19E-10 | 8.19E-10 | SLPF(7,1) |
| Sf-1 | Th-232 | 3.42E-10 | 3.42E-10 | SLPF(8,1) |
| Sf-1 | U-234 | 2.52E-10 | 2.52E-10 | SLPF(9,1) |
| Sf-1 | U-235+D | 5.43E-07 | 5.18E-07 | SLPF(10,1) |
| Sf-1 | U-238 | 4.99E-11 | 4.99E-11 | SLPF(11,1) |
| Sf-1 | U-238+D | 1.14E-07 | 4.99E-11 | SLPF(12,1) |
| Sf-2 | Inhalation, slope factors, 1/(pCi): | | | |
| Sf-2 | Ac-227+D | 2.09E-07 | 1.49E-07 | SLPF(1,2) |
| Sf-2 | Pa-231 | 4.55E-08 | 4.55E-08 | SLPF(2,2) |
| Sf-2 | Pb-210+D | 1.39E-08 | 2.77E-09 | SLPF(3,2) |
| Sf-2 | Ra-226+D | 1.16E-08 | 1.15E-08 | SLPF(4,2) |
| Sf-2 | Ra-228+D | 5.23E-09 | 5.18E-09 | SLPF(5,2) |
| Sf-2 | Th-228+D | 1.43E-07 | 1.32E-07 | SLPF(6,2) |

| | | | | |
|------|--|----------|----------|-------------|
| Sf-2 | Th-230 | 2.85E-08 | 2.85E-08 | SLPF(7,2) |
| Sf-2 | Th-232 | 4.33E-08 | 4.33E-08 | SLPF(8,2) |
| Sf-2 | U-234 | 1.14E-08 | 1.14E-08 | SLPF(9,2) |
| Sf-2 | U-235+D | 1.01E-08 | 1.01E-08 | SLPF(10,2) |
| Sf-2 | U-238 | 9.32E-09 | 9.32E-09 | SLPF(11,2) |
| Sf-2 | U-238+D | 9.35E-09 | 9.32E-09 | SLPF(12,2) |
| Sf-3 | Food ingestion, slope factors, 1/(pCi): | | | |
| Sf-3 | Ac-227+D | 6.53E-10 | 2.45E-10 | SLPF(1,3) |
| Sf-3 | Pa-231 | 2.26E-10 | 2.26E-10 | SLPF(2,3) |
| Sf-3 | Pb-210+D | 3.44E-09 | 1.18E-09 | SLPF(3,3) |
| Sf-3 | Ra-226+D | 5.15E-10 | 5.14E-10 | SLPF(4,3) |
| Sf-3 | Ra-228+D | 1.43E-09 | 1.43E-09 | SLPF(5,3) |
| Sf-3 | Th-228+D | 4.22E-10 | 1.48E-10 | SLPF(6,3) |
| Sf-3 | Th-230 | 1.19E-10 | 1.19E-10 | SLPF(7,3) |
| Sf-3 | Th-232 | 1.33E-10 | 1.33E-10 | SLPF(8,3) |
| Sf-3 | U-234 | 9.55E-11 | 9.55E-11 | SLPF(9,3) |
| Sf-3 | U-235+D | 9.76E-11 | 9.44E-11 | SLPF(10,3) |
| Sf-3 | U-238 | 8.66E-11 | 8.66E-11 | SLPF(11,3) |
| Sf-3 | U-238+D | 1.21E-10 | 8.66E-11 | SLPF(12,3) |
| Sf-3 | Water ingestion, slope factors, 1/(pCi): | | | |
| Sf-3 | Ac-227+D | 4.86E-10 | 2.01E-10 | SLPF(1,4) |
| Sf-3 | Pa-231 | 1.73E-10 | 1.73E-10 | SLPF(2,4) |
| Sf-3 | Pb-210+D | 1.27E-09 | 8.81E-10 | SLPF(3,4) |
| Sf-3 | Ra-226+D | 3.86E-10 | 3.85E-10 | SLPF(4,4) |
| Sf-3 | Ra-228+D | 1.04E-09 | 1.04E-09 | SLPF(5,4) |
| Sf-3 | Th-228+D | 3.00E-10 | 1.07E-10 | SLPF(6,4) |
| Sf-3 | Th-230 | 9.10E-11 | 9.10E-11 | SLPF(7,4) |

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Cancer Risk Slope Factors Summary Table (continued)
Risk Library: HEAST 2001 Morbidity

| 0 Menu | Parameter | Current Value | Base Case* | Parameter Name |
|-----------|---|------------------|---------------|-------------------|
| Sf-3 | Th-232 | 1.01E-10 | 1.01E-10 | SLPF(8,4) |
| Sf-3 | U-234 | 7.07E-11 | 7.07E-11 | SLPF(9,4) |
| Sf-3 | U-235+D | 7.18E-11 | 6.96E-11 | SLPF(10,4) |
| Sf-3 | U-238 | 6.40E-11 | 6.40E-11 | SLPF(11,4) |
| Sf-3 | U-238+D | 8.71E-11 | 6.40E-11 | SLPF(12,4) |
| Sf-3 | Soil ingestion, slope factors, 1/(pCi): | | | |
| Sf-3 | Ac-227+D | 1.16E-09 | 3.81E-10 | SLPF(1,5) |
| Sf-3 | Pa-231 | 3.74E-10 | 3.74E-10 | SLPF(2,5) |
| Sf-3 | Pb-210+D | 2.66E-09 | 1.84E-09 | SLPF(3,5) |
| Sf-3 | Ra-226+D | 7.30E-10 | 7.29E-10 | SLPF(4,5) |
| Sf-3 | Ra-228+D | 2.29E-09 | 2.28E-09 | SLPF(5,5) |

| | | | | |
|-------|--|----------|----------|-------------|
| Sf-3 | Th-228+D | 8.09E-10 | 2.89E-10 | SLPF(6,5) |
| Sf-3 | Th-230 | 2.02E-10 | 2.02E-10 | SLPF(7,5) |
| Sf-3 | Th-232 | 2.31E-10 | 2.31E-10 | SLPF(8,5) |
| Sf-3 | U-234 | 1.58E-10 | 1.58E-10 | SLPF(9,5) |
| Sf-3 | U-235+D | 1.63E-10 | 1.57E-10 | SLPF(10,5) |
| Sf-3 | U-238 | 1.43E-10 | 1.43E-10 | SLPF(11,5) |
| Sf-3 | U-238+D | 2.10E-10 | 1.43E-10 | SLPF(12,5) |
| Sf-Rn | Radon Inhalation slope factors, 1/(pCi): | | | |
| Sf-Rn | Rn-222 | 1.80E-12 | 1.80E-12 | SLPFRN(1,1) |
| Sf-Rn | Po-218 | 3.70E-12 | 3.70E-12 | SLPFRN(1,2) |
| Sf-Rn | Pb-214 | 6.20E-12 | 6.20E-12 | SLPFRN(1,3) |
| Sf-Rn | Bi-214 | 1.50E-11 | 1.50E-11 | SLPFRN(1,4) |
| Sf-Rn | Rn-220 | 1.90E-13 | 1.90E-13 | SLPFRN(2,1) |
| Sf-Rn | Po-216 | 3.00E-15 | 3.00E-15 | SLPFRN(2,2) |
| Sf-Rn | Pb-212 | 3.90E-11 | 3.90E-11 | SLPFRN(2,3) |
| Sf-Rn | Bi-212 | 3.70E-11 | 3.70E-11 | SLPFRN(2,4) |
| Sf-Rn | Radon K factors, (mrem/WLM): | | | |
| Sf-Rn | Rn-222 Indoor | 7.60E+02 | 7.60E+02 | KFACTR(1,1) |
| Sf-Rn | Rn-222 Outdoor | 5.70E+02 | 5.70E+02 | KFACTR(1,2) |
| Sf-Rn | Rn-220 Indoor | 1.50E+02 | 1.50E+02 | KFACTR(2,1) |
| Sf-Rn | Rn-220 Outdoor | 2.50E+02 | 2.50E+02 | KFACTR(2,2) |

*Base Case means Default.Lib w/o Associate Nuclide contributions.
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| | | | | | | | | | | |
|--------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Po-212 | 0.000E+00 |
| Po-214 | 3.860E-10 | 5.040E-01 |
| Po-215 | 7.480E-10 | 5.067E-01 |
| Po-216 | 7.870E-11 | 5.056E-01 |
| Po-218 | 4.260E-11 | 5.056E-01 |
| Ra-223 | 4.340E-07 | 5.113E-01 |
| Ra-224 | 3.720E-08 | 5.115E-01 |
| Ra-226 | 2.290E-08 | 5.128E-01 |
| Ra-228 | 0.000E+00 |
| Rn-219 | 2.250E-07 | 5.094E-01 |
| Rn-220 | 1.700E-09 | 5.045E-01 |
| Rn-222 | 1.740E-09 | 5.045E-01 |
| Th-227 | 3.780E-07 | 5.119E-01 |
| Th-228 | 5.590E-09 | 5.142E-01 |
| Th-230 | 8.190E-10 | 5.162E-01 |
| Th-231 | 2.450E-08 | 5.168E-01 |
| Th-232 | 3.420E-10 | 5.188E-01 |
| Th-234 | 1.630E-08 | 5.174E-01 |
| Tl-207 | 1.520E-08 | 5.062E-01 |
| Tl-208 | 1.760E-05 | 5.075E-01 |
| Tl-210 | 0.000E+00 | 5.384E-01 |
| U-234 | 2.520E-10 | 5.192E-01 |
| U-235 | 5.180E-07 | 5.125E-01 |
| U-238 | 4.990E-11 | 5.337E-01 |

* - Units are 1/yr per (pCi/g) at infinite depth and area. Multiplication by ETGF(i,t) converts to site conditions.

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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As pCi/yr at t= 0.000E+00 years

| Radio-Nuclide | Water Independent Pathways (Inhalation w/o radon) | | | | | Water Dependent Pathways | | | | | Total Ingestion* |
|---------------|---|-----------|-----------|-----------|-----------|--------------------------|-----------|-----------|-----------|-----------|------------------|
| | Inhalation | Plant | Meat | Milk | Soil | Water | Fish | Plant | Meat | Milk | |
| Ac-227 | 2.387E-04 | 8.290E+00 | 0.000E+00 | 0.000E+00 | 4.506E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.280E+01 |
| Pa-231 | 1.534E-03 | 2.131E+02 | 0.000E+00 | 0.000E+00 | 2.897E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.421E+02 |
| Pb-210 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Ra-226 | 4.740E-03 | 2.633E+03 | 0.000E+00 | 0.000E+00 | 8.948E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.723E+03 |
| Ra-228 | 1.620E-03 | 8.999E+02 | 0.000E+00 | 0.000E+00 | 3.058E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 9.304E+02 |
| Th-228 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Th-230 | 3.307E-03 | 4.597E+01 | 0.000E+00 | 0.000E+00 | 6.245E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.084E+02 |
| Th-232 | 1.858E-03 | 2.583E+01 | 0.000E+00 | 0.000E+00 | 3.509E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.091E+01 |
| U-234 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| U-235 | 1.364E-04 | 4.737E+00 | 0.000E+00 | 0.000E+00 | 2.575E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.312E+00 |
| U-238 | 2.455E-03 | 8.527E+01 | 0.000E+00 | 0.000E+00 | 4.635E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.316E+02 |

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil

and water-dependent water, fish, plant, meat, milk pathways

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 0.000E+00 years
Radionuclides

| Radon Pathway | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
|------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Water-ind. | 0.000E+00 |
| Water-dep. | 0.000E+00 |
| Total | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

| Radio- Nuclide | Water Independent Pathways (Inhalation excludes radon) | | | | | | | | | | | |
|-------------------|--|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | Ground | | Inhalation | | Plant | | Meat | | Milk | | Soil | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 9.005E-06 | 0.0134 | 4.281E-09 | 0.0000 | 4.688E-07 | 0.0007 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.499E-07 | 0.0007 |
| Pa-231 | 1.890E-06 | 0.0028 | 2.072E-09 | 0.0000 | 1.429E-06 | 0.0021 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.215E-07 | 0.0005 |
| Pb-210 | 6.263E-08 | 0.0001 | 6.836E-10 | 0.0000 | 2.376E-05 | 0.0353 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.474E-06 | 0.0037 |
| Ra-226 | 3.551E-04 | 0.5280 | 1.629E-09 | 0.0000 | 4.028E-05 | 0.0599 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.942E-06 | 0.0029 |
| Ra-228 | 7.228E-05 | 0.1075 | 2.806E-10 | 0.0000 | 4.254E-05 | 0.0633 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.315E-06 | 0.0034 |
| Th-228 | 1.123E-04 | 0.1670 | 6.929E-09 | 0.0000 | 4.379E-07 | 0.0007 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.417E-07 | 0.0011 |
| Th-230 | 2.460E-08 | 0.0000 | 2.827E-09 | 0.0000 | 1.641E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.784E-07 | 0.0006 |
| Th-232 | 5.802E-09 | 0.0000 | 2.414E-09 | 0.0000 | 1.031E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.431E-07 | 0.0004 |
| U-234 | 2.369E-13 | 0.0000 | 3.519E-14 | 0.0000 | 1.024E-11 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.210E-12 | 0.0000 |
| U-235 | 6.605E-07 | 0.0010 | 4.089E-11 | 0.0000 | 1.373E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.249E-08 | 0.0000 |
| U-238 | 2.465E-06 | 0.0037 | 6.814E-10 | 0.0000 | 3.053E-07 | 0.0005 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.889E-07 | 0.0004 |
| Total | 5.537E-04 | 0.8235 | 2.184E-08 | 0.0000 | 1.095E-04 | 0.1628 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.167E-06 | 0.0136 |

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

Water Dependent Pathways

| Radio- Nuclide | Water | | Fish | | Plant | | Meat | | Milk | | All Pathways** | |
|-------------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|----------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 9.928E-06 | 0.0148 |
| Pa-231 | 0.000E+00 | 0.0000 | 3.643E-06 | 0.0054 |

| | | | | | | | | | | | | |
|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| Pb-210 | 0.000E+00 | 0.0000 | 2.630E-05 | 0.0391 |
| Ra-226 | 0.000E+00 | 0.0000 | 3.973E-04 | 0.5908 |
| Ra-228 | 0.000E+00 | 0.0000 | 1.171E-04 | 0.1742 |
| Th-228 | 0.000E+00 | 0.0000 | 1.135E-04 | 0.1687 |
| Th-230 | 0.000E+00 | 0.0000 | 5.699E-07 | 0.0008 |
| Th-232 | 0.000E+00 | 0.0000 | 3.544E-07 | 0.0005 |
| U-234 | 0.000E+00 | 0.0000 | 1.972E-11 | 0.0000 |
| U-235 | 0.000E+00 | 0.0000 | 6.867E-07 | 0.0010 |
| U-238 | 0.000E+00 | 0.0000 | 3.059E-06 | 0.0045 |
| Total | 0.000E+00 | 0.0000 | 6.724E-04 | 1.0000 |

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 0.000E+00 years

| Radionuclides | | | | | | | | |
|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Radon Pathway | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
| Water-ind. | 0.000E+00 |
| Water-dep. | 0.000E+00 |
| Total | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

0
0
0
Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction cf Total Risk at t= 0.000E+00 years

| Water Independent Pathways (Inhalation excludes radon) | | | | | | | | | | | | | | |
|--|-----------|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| Radio-Nuclide | Ground | | Inhalation | | Radon | | Plant | | Meat | | Milk | | Soil | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 1.980E-06 | 0.0029 | 9.412E-10 | 0.0000 | 0.000E+00 | 0.0000 | 1.023E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.891E-08 | 0.0001 |
| Pa-231 | 8.915E-06 | 0.0133 | 5.412E-09 | 0.0000 | 0.000E+00 | 0.0000 | 1.796E-06 | 0.0027 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.725E-07 | 0.0010 |
| Ra-226 | 3.535E-04 | 0.5257 | 2.303E-09 | 0.0000 | 0.000E+00 | 0.0000 | 6.378E-05 | 0.0948 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.399E-06 | 0.0065 |
| Ra-228 | 4.724E-05 | 0.0703 | 1.901E-09 | 0.0000 | 0.000E+00 | 0.0000 | 1.048E-05 | 0.0156 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.582E-07 | 0.0011 |
| Th-230 | 1.635E-06 | 0.0024 | 2.837E-09 | 0.0000 | 0.000E+00 | 0.0000 | 4.237E-07 | 0.0006 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.952E-07 | 0.0006 |
| Th-232 | 1.373E-04 | 0.2042 | 7.723E-09 | 0.0000 | 0.000E+00 | 0.0000 | 3.260E-05 | 0.0485 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.542E-06 | 0.0038 |
| U-235 | 6.607E-07 | 0.0010 | 4.102E-11 | 0.0000 | 0.000E+00 | 0.0000 | 1.378E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.250E-08 | 0.0000 |
| U-238 | 2.465E-06 | 0.0037 | 6.814E-10 | 0.0000 | 0.000E+00 | 0.0000 | 3.053E-07 | 0.0005 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.889E-07 | 0.0004 |
| Total | 5.537E-04 | 0.8235 | 2.184E-08 | 0.0000 | 0.000E+00 | 0.0000 | 1.095E-04 | 0.1628 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.167E-06 | 0.0136 |

0
0
0
Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)

and Fraction of Total Risk at t = 0.000E+00 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Radon | | Plant | | Meat | | Milk | | All pathways | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|--------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 2.182E-06 | 0.0032 |
| Pa-231 | 0.000E+00 | 0.0000 | 1.139E-05 | 0.0169 |
| Ra-226 | 0.000E+00 | 0.0000 | 4.217E-04 | 0.6271 |
| Ra-228 | 0.000E+00 | 0.0000 | 5.848E-05 | 0.0870 |
| Th-230 | 0.000E+00 | 0.0000 | 2.457E-06 | 0.0037 |
| Th-232 | 0.000E+00 | 0.0000 | 1.725E-04 | 0.2565 |
| U-235 | 0.000E+00 | 0.0000 | 6.870E-07 | 0.0010 |
| U-238 | 0.000E+00 | 0.0000 | 3.060E-06 | 0.0045 |
| Total | 0.000E+00 | 0.0000 | 6.724E-04 | 1.0000 |

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As pCi/yr at t = 1.000E+00 years

| Radio-Nuclide | Water Independent Pathways (Inhalation w/o radon) | | | | | Water Dependent Pathways | | | | | Total Ingestion* |
|---------------|---|-----------|-----------|-----------|-----------|--------------------------|-----------|-----------|-----------|-----------|------------------|
| | Inhalation | Plant | Meat | Milk | Soil | Water | Fish | Plant | Meat | Milk | |
| Ac-227 | 2.788E-04 | 9.862E+00 | 0.000E+00 | 0.000E+00 | 5.264E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.513E+01 |
| Pa-231 | 1.533E-03 | 2.130E+02 | 0.000E+00 | 0.000E+00 | 2.895E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.419E+02 |
| Pb-210 | 1.450E-04 | 2.227E+01 | 0.000E+00 | 0.000E+00 | 2.737E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.501E+01 |
| Ra-226 | 4.737E-03 | 2.632E+03 | 0.000E+00 | 0.000E+00 | 8.943E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.721E+03 |
| Ra-228 | 1.646E-03 | 9.103E+02 | 0.000E+00 | 0.000E+00 | 3.108E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 9.414E+02 |
| Th-228 | 4.966E-04 | 1.804E+01 | 0.000E+00 | 0.000E+00 | 9.376E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.742E+01 |
| Th-230 | 3.307E-03 | 4.597E+01 | 0.000E+00 | 0.000E+00 | 6.245E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.084E+02 |
| Th-232 | 1.858E-03 | 2.583E+01 | 0.000E+00 | 0.000E+00 | 3.509E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.091E+01 |
| U-234 | 6.955E-09 | 2.416E-04 | 0.000E+00 | 0.000E+00 | 1.313E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 3.729E-04 |
| U-235 | 1.363E-04 | 4.734E+00 | 0.000E+00 | 0.000E+00 | 2.573E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.307E+00 |
| U-238 | 2.453E-03 | 8.521E+01 | 0.000E+00 | 0.000E+00 | 4.632E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.315E+02 |

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil and water-dependent water, fish, plant, meat, milk pathways

0 Amcunt of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of Radon and its Decay Products as pCi/yr at t = 1.000E+00 years

0 Radon Radionuclides

| Pathway | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-22C | Po-216 | Pb-212 | Bi-212 |
|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Water-ind. | 0.000E+00 |
| Water-dep. | 0.000E+00 |
| Total | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent
 1RESRAD, Version 6.5 T½ Limit = 180 days 12/04/2013 15:00 Page 9
 Intrisk : SLDS Mean Background_ISOU Resident

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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+00 years

| Radio-Nuclide | Water Independent Pathways (Inhalation excludes radon) | | | | | | | | | | | |
|---------------|--|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | Ground | | Inhalation | | Plant | | Meat | | Milk | | Soil | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 9.333E-06 | 0.0138 | 4.437E-09 | 0.0000 | 4.858E-07 | 0.0007 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.663E-07 | 0.0007 |
| Pa-231 | 1.888E-06 | 0.0028 | 2.070E-09 | 0.0000 | 1.428E-06 | 0.0021 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.213E-07 | 0.0005 |
| Pb-210 | 6.618E-08 | 0.0001 | 7.223E-10 | 0.0000 | 2.509E-05 | 0.0370 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.614E-06 | 0.0039 |
| Ra-226 | 3.548E-04 | 0.5233 | 1.6228E-09 | 0.0000 | 4.025E-05 | 0.0594 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.941E-06 | 0.0029 |
| Ra-228 | 7.257E-05 | 0.1070 | 2.817E-10 | 0.0000 | 4.270E-05 | 0.0630 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.325E-06 | 0.0034 |
| Th-228 | 1.159E-04 | 0.1709 | 7.154E-09 | 0.0000 | 4.485E-07 | 0.0007 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.658E-07 | 0.0011 |
| Th-230 | 2.460E-08 | 0.0000 | 2.827E-09 | 0.0000 | 1.641E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.784E-07 | 0.0006 |
| Th-232 | 5.802E-09 | 0.0000 | 2.414E-09 | 0.0000 | 1.031E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.431E-07 | 0.0004 |
| U-234 | 2.526E-13 | 0.0000 | 3.752E-14 | 0.0000 | 1.092E-11 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.819E-12 | 0.0000 |
| U-235 | 6.600E-07 | 0.0010 | 4.086E-11 | 0.0000 | 1.372E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.248E-08 | 0.0000 |
| U-238 | 2.463E-06 | 0.0036 | 6.809E-10 | 0.0000 | 3.050E-07 | 0.0004 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.887E-07 | 0.0004 |
| Total | 5.578E-04 | 0.8225 | 2.226E-08 | 0.0000 | 1.110E-04 | 0.1637 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.355E-06 | 0.0138 |

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+00 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Plant | | Meat | | Milk | | All Pathways** | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|----------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 1.029E-05 | 0.0152 |
| Pa-231 | 0.000E+00 | 0.0000 | 3.640E-06 | 0.0054 |
| Pb-210 | 0.000E+00 | 0.0000 | 2.777E-05 | 0.0410 |
| Ra-226 | 0.000E+00 | 0.0000 | 3.970E-04 | 0.5855 |
| Ra-228 | 0.000E+00 | 0.0000 | 1.176E-04 | 0.1734 |
| Th-228 | 0.000E+00 | 0.0000 | 1.171E-04 | 0.1727 |
| Th-230 | 0.000E+00 | 0.0000 | 5.699E-07 | 0.0008 |
| Th-232 | 0.000E+00 | 0.0000 | 3.544E-07 | 0.0005 |

| | | | | | | | | | | | | |
|--------------|------------------|---------------|------------------|---------------|------------------|---------------|------------------|---------------|------------------|---------------|------------------|---------------|
| U-234 | 0.000E+00 | 0.0000 | 2.103E-11 | 0.0000 |
| U-235 | 0.000E+00 | 0.0000 | 6.862E-07 | 0.0010 |
| U-238 | 0.000E+00 | 0.0000 | 3.057E-06 | 0.0045 |
| Total | 0.000E+00 | 0.0000 | 6.781E-04 | 1.0000 |

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+00 years

| Radionuclides | | | | | | | | |
|---------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Radon Pathway | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
| Water-ind. | 0.000E+00 |
| Water-dep. | 0.000E+00 |
| Total | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

0 Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

| Water Independent Pathways (Inhalation excludes radon) | | | | | | | | | | | | | | |
|--|------------------|---------------|------------------|---------------|------------------|---------------|------------------|---------------|------------------|---------------|------------------|---------------|------------------|---------------|
| Radio-Nuclide | Ground | | Inhalation | | Radon | | Plant | | Meat | | Milk | | Soil | |
| | risk | fract. |
| Ac-227 | 1.914E-06 | 0.0028 | 9.101E-10 | 0.0000 | 0.000E+00 | 0.0000 | 9.893E-08 | 0.0001 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.564E-08 | 0.0001 |
| Pa-231 | 9.307E-06 | 0.0137 | 5.597E-09 | 0.0000 | 0.000E+00 | 0.0000 | 1.815E-06 | 0.0027 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.919E-07 | 0.0010 |
| Ra-226 | 3.532E-04 | 0.5208 | 2.340E-09 | 0.0000 | 0.000E+00 | 0.0000 | 6.506E-05 | 0.0959 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.536E-06 | 0.0067 |
| Ra-228 | 4.479E-05 | 0.0660 | 1.865E-09 | 0.0000 | 0.000E+00 | 0.0000 | 9.295E-06 | 0.0137 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.912E-07 | 0.0010 |
| Th-230 | 1.742E-06 | 0.0026 | 2.838E-09 | 0.0000 | 0.000E+00 | 0.0000 | 4.431E-07 | 0.0007 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.965E-07 | 0.0006 |
| Th-232 | 1.437E-04 | 0.2119 | 7.984E-09 | 0.0000 | 0.000E+00 | 0.0000 | 3.396E-05 | 0.0501 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.642E-06 | 0.0039 |
| U-235 | 6.602E-07 | 0.0010 | 4.100E-11 | 0.0000 | 0.000E+00 | 0.0000 | 1.377E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.249E-08 | 0.0000 |
| U-238 | 2.463E-06 | 0.0036 | 6.809E-10 | 0.0000 | 0.000E+00 | 0.0000 | 3.050E-07 | 0.0004 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.887E-07 | 0.0004 |
| Total | 5.578E-04 | 0.8225 | 2.226E-08 | 0.0000 | 0.000E+00 | 0.0000 | 1.110E-04 | 0.1637 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.355E-06 | 0.0138 |

0 Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

Water Dependent Pathways

| Radio- | Water | Fish | Radon | Plant | Meat | Milk | All pathways |
|--------|-------|------|-------|-------|------|------|--------------|
| | | | | | | | |

| Nuclide | risk | fract. |
|---------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| Ac-227 | 0.000E+00 | 0.0000 | 2.110E-06 | 0.0031 |
| Pa-231 | 0.000E+00 | 0.0000 | 1.182E-05 | 0.0174 |
| Ra-226 | 0.000E+00 | 0.0000 | 4.228E-04 | 0.6235 |
| Ra-228 | 0.000E+00 | 0.0000 | 5.478E-05 | 0.0808 |
| Th-230 | 0.000E+00 | 0.0000 | 2.584E-06 | 0.0038 |
| Th-232 | 0.000E+00 | 0.0000 | 1.803E-04 | 0.2659 |
| U-235 | 0.000E+00 | 0.0000 | 6.865E-07 | 0.0010 |
| U-238 | 0.000E+00 | 0.0000 | 3.057E-06 | 0.0045 |
| Total | 0.000E+00 | 0.0000 | 6.781E-04 | 1.0000 |

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t = 3.000E+00 years

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil and water-dependent water, fish, plant, meat, milk pathways

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of Radon and its Decay Products as pCi/yr at t= 3.000E+00 years
Radionuclides

| Radon Pathway | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Water-ind. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+C0 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Water-dep. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+C0 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Total | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+C0 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent
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 Intrisk : SLDS Mean Background_ISOU Resident
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 3.000E+00 years

| Radio-Nuclide | Water Independent Pathways (Inhalation excludes radon) | | | | | | | | | | | |
|---------------|--|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | Ground | | Inhalation | | Plant | | Meat | | Milk | | Soil | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 9.955E-06 | 0.0145 | 4.733E-09 | 0.0000 | 5.179E-07 | 0.0008 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.974E-07 | 0.0007 |
| Pa-231 | 1.886E-06 | 0.0027 | 2.067E-09 | 0.0000 | 1.426E-06 | 0.0021 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.208E-07 | 0.0005 |
| Pb-210 | 7.293E-08 | 0.0001 | 7.959E-10 | 0.0000 | 2.763E-05 | 0.0402 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.880E-06 | 0.0042 |
| Ra-226 | 3.544E-04 | 0.5161 | 1.626E-09 | 0.0000 | 4.020E-05 | 0.0585 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.938E-06 | 0.0028 |
| Ra-228 | 7.304E-05 | 0.1064 | 2.835E-10 | 0.0000 | 4.299E-05 | 0.0626 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.340E-06 | 0.0034 |
| Th-228 | 1.206E-04 | 0.1756 | 7.442E-09 | 0.0000 | 4.614E-07 | 0.0007 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.967E-07 | 0.0012 |
| Th-230 | 2.460E-08 | 0.0000 | 2.827E-09 | 0.0000 | 1.641E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.784E-07 | 0.0006 |
| Th-232 | 5.802E-09 | 0.0000 | 2.414E-09 | 0.0000 | 1.031E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.431E-07 | 0.0004 |
| U-234 | 2.838E-13 | 0.0000 | 4.217E-14 | 0.0000 | 1.227E-11 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.103E-11 | 0.0000 |
| U-235 | 6.591E-07 | 0.0010 | 4.080E-11 | 0.0000 | 1.370E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.246E-08 | 0.0000 |
| U-238 | 2.459E-06 | 0.0036 | 6.799E-10 | 0.0000 | 3.046E-07 | 0.0004 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.883E-07 | 0.0004 |
| Total | 5.631E-04 | 0.8201 | 2.291E-08 | 0.0000 | 1.138E-04 | 0.1657 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.695E-06 | 0.0141 |

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 3.000E+00 years

Water Dependent Pathways

| Radio-Nuclide | Water Dependent Pathways | | | | | | | | | | | |
|---------------|--------------------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|----------------|--------|
| | Water | | Fish | | Plant | | Meat | | Milk | | All Pathways** | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.097E-05 | 0.0160 |
| Pa-231 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.635E-06 | 0.0053 |
| Pb-210 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.058E-05 | 0.0445 |
| Ra-226 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.965E-04 | 0.5775 |
| Ra-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.184E-04 | 0.1724 |
| Th-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.219E-04 | 0.1775 |
| Th-230 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 5.699E-07 | 0.0008 |
| Th-232 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.544E-07 | 0.0005 |
| U-234 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.363E-11 | 0.0000 |
| U-235 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.853E-07 | 0.0010 |
| U-238 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.053E-06 | 0.0044 |
| Total | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.866E-04 | 1.0000 |

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

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Inrisk : SLDS Mean Background_ISOU Resident

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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+00 years

| Radionuclides | | | | | | | | |
|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Radon Pathway | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
| Water-ind. | 0.000E+00 |
| Water-dep. | 0.000E+00 |
| Total | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existing Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

| Water Independent Pathways (Inhalation excludes radon) | | | | | | | | | | | | | | |
|--|-----------|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| Radio-Nuclide | Ground | | Inhalation | | Radon | | Plant | | Meat | | Milk | | Soil | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 1.790E-06 | 0.0026 | 8.509E-10 | 0.0000 | 0.000E+00 | 0.0000 | 9.250E-08 | 0.0001 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.942E-08 | 0.0001 |
| Pa-231 | 1.005E-05 | 0.0146 | 5.949E-09 | 0.0000 | 0.000E+00 | 0.0000 | 1.851E-06 | 0.0027 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.287E-07 | 0.0011 |
| Ra-226 | 3.525E-04 | 0.5134 | 2.410E-09 | 0.0000 | 0.000E+00 | 0.0000 | 6.751E-05 | 0.0983 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.797E-06 | 0.0070 |
| Ra-228 | 3.841E-05 | 0.0559 | 1.665E-09 | 0.0000 | 0.000E+00 | 0.0000 | 7.304E-06 | 0.0106 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 5.640E-07 | 0.0008 |
| Th-230 | 1.955E-06 | 0.0028 | 2.839E-09 | 0.0000 | 0.000E+00 | 0.0000 | 4.832E-07 | 0.0007 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.994E-07 | 0.0006 |
| Th-232 | 1.552E-04 | 0.2261 | 8.475E-09 | 0.0000 | 0.000E+00 | 0.0000 | 3.625E-05 | 0.0528 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.816E-06 | 0.0041 |
| U-235 | 6.593E-07 | 0.0010 | 4.096E-11 | 0.0000 | 0.000E+00 | 0.0000 | 1.376E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.248E-08 | 0.0000 |
| U-238 | 2.459E-06 | 0.0036 | 6.799E-10 | 0.0000 | 0.000E+00 | 0.0000 | 3.046E-07 | 0.0004 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.883E-07 | 0.0004 |
| Total | 5.631E-04 | 0.8201 | 2.291E-08 | 0.0000 | 0.000E+00 | 0.0000 | 1.138E-04 | 0.1657 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.695E-06 | 0.0141 |

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existing Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Radon | | Plant | | Meat | | Milk | | All pathways | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|--------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 1.972E-06 | 0.0029 |
| Pa-231 | 0.000E+00 | 0.0000 | 1.264E-05 | 0.0184 |
| Ra-226 | 0.000E+00 | 0.0000 | 4.243E-04 | 0.6188 |
| Ra-228 | 0.000E+00 | 0.0000 | 4.623E-05 | 0.0674 |

| | | | | | | | | | | | | | | |
|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| Th-230 | 0.000E+00 | 0.0000 | 2.841E-06 | 0.0041 |
| Th-232 | 0.000E+00 | 0.0000 | 1.943E-04 | 0.2830 |
| U-235 | 0.000E+00 | 0.0000 | 6.856E-07 | 0.0010 |
| U-238 | 0.000E+00 | 0.0000 | 3.053E-06 | 0.0044 |
| Total | 0.000E+00 | 0.0000 | 6.866E-04 | 1.0000 |

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides
 1RESRAD, Version 6.5 T_{1/2} Limit = 180 days 12/04/2013 15:00 Page 14
 Intrisk : SLDS Mean Background_ISOU Resident
 File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\BKGD MEAN ISOU RESIDENT.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As pCi/yr at t= 1.000E+01 years

| Radio-Nuclide | Water Independent Pathways (Inhalation w/o radon) | | | | | Water Dependent Pathways | | | | | Total Ingestion* |
|---------------|---|-----------|-----------|-----------|-----------|--------------------------|-----------|-----------|-----------|-----------|------------------|
| | Inhalation | Plant | Meat | Milk | Soil | Water | Fish | Plant | Meat | Milk | |
| Ac-227 | 5.838E-04 | 2.045E+01 | 0.000E+00 | 0.000E+00 | 1.102E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 3.148E+01 |
| Pa-231 | 1.523E-03 | 2.116E+02 | 0.000E+00 | 0.000E+00 | 2.876E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.403E+02 |
| Pb-210 | 1.260E-03 | 1.771E+02 | 0.000E+00 | 0.000E+00 | 2.379E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.009E+02 |
| Ra-226 | 4.709E-03 | 2.616E+03 | 0.000E+00 | 0.000E+00 | 8.891E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.705E+03 |
| Ra-228 | 1.782E-03 | 9.857E+02 | 0.000E+00 | 0.000E+00 | 3.364E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.019E+03 |
| Th-228 | 1.707E-03 | 3.579E+01 | 0.000E+00 | 0.000E+00 | 3.223E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.802E+01 |
| Th-230 | 3.307E-03 | 4.596E+01 | 0.000E+00 | 0.000E+00 | 6.244E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.084E+02 |
| Th-232 | 1.858E-03 | 2.583E+01 | 0.000E+00 | 0.000E+00 | 3.509E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.091E+01 |
| U-234 | 6.910E-08 | 2.400E-03 | 0.000E+00 | 0.000E+00 | 1.305E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 3.705E-03 |
| U-235 | 1.354E-04 | 4.704E+00 | 0.000E+00 | 0.000E+00 | 2.557E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.260E+00 |
| U-238 | 2.438E-03 | 8.466E+01 | 0.000E+00 | 0.000E+00 | 4.602E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.307E+02 |

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
 and water-dependent water, fish, plant, meat, milk pathways

0
 Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
 Radon and its Decay Products as pCi/yr at t= 1.000E+01 years
 Radionuclides

| Radon Pathway | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Water-ind. | 0.000E+00 |
| Water-dep. | 0.000E+00 |
| Total | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent
 1RESRAD, Version 6.5 T_{1/2} Limit = 180 days 12/04/2013 15:00 Page 15
 Intrisk : SLDS Mean Background_ISOU Resident
 File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\BKGD MEAN ISOU RESIDENT.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

| Radio-Nuclide | Water Independent Pathways (Inhalation excludes radon) | | | | | | | | | | | |
|---------------|--|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | Ground | | Inhalation | | Plant | | Meat | | Milk | | Soil | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 1.182E-05 | 0.0168 | 5.618E-09 | 0.0000 | 6.141E-07 | 0.0009 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 5.904E-07 | 0.0008 |
| Pa-231 | 1.876E-06 | 0.0027 | 2.056E-09 | 0.0000 | 1.419E-06 | 0.0020 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.191E-07 | 0.0005 |
| Pb-210 | 9.337E-08 | 0.0001 | 1.019E-09 | 0.0000 | 3.531E-05 | 0.0503 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.687E-06 | 0.0052 |
| Ra-226 | 3.528E-04 | 0.5022 | 1.618E-09 | 0.0000 | 4.002E-05 | 0.0570 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.929E-06 | 0.0027 |
| Ra-228 | 7.404E-05 | 0.1054 | 2.874E-10 | 0.0000 | 4.357E-05 | 0.0620 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.372E-06 | 0.0034 |
| Th-228 | 1.261E-04 | 0.1795 | 7.784E-09 | 0.0000 | 4.776E-07 | 0.0007 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.333E-07 | 0.0012 |
| Th-230 | 2.460E-08 | 0.0000 | 2.827E-09 | 0.0000 | 1.641E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.783E-07 | 0.0005 |
| Th-232 | 5.802E-09 | 0.0000 | 2.414E-09 | 0.0000 | 1.031E-07 | 0.0001 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.431E-07 | 0.0003 |
| U-234 | 3.926E-13 | 0.0000 | 5.832E-14 | 0.0000 | 1.697E-11 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.526E-11 | 0.0000 |
| U-235 | 6.558E-07 | 0.0009 | 4.060E-11 | 0.0000 | 1.363E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.240E-08 | 0.0000 |
| U-238 | 2.447E-06 | 0.0035 | 6.765E-10 | 0.0000 | 3.031E-07 | 0.0004 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.869E-07 | 0.0004 |
| Total | 5.699E-04 | 0.8112 | 2.434E-08 | 0.0000 | 1.220E-04 | 0.1736 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.065E-05 | 0.0152 |

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Plant | | Meat | | Milk | | All Pathways** | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|----------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 1.303E-05 | 0.0185 |
| Pa-231 | 0.000E+00 | 0.0000 | 3.616E-06 | 0.0051 |
| Pb-210 | 0.000E+00 | 0.0000 | 3.909E-05 | 0.0556 |
| Ra-226 | 0.000E+00 | 0.0000 | 3.948E-04 | 0.5619 |
| Ra-228 | 0.000E+00 | 0.0000 | 1.200E-04 | 0.1708 |
| Th-228 | 0.000E+00 | 0.0000 | 1.274E-04 | 0.1814 |
| Th-230 | 0.000E+00 | 0.0000 | 5.698E-07 | 0.0008 |
| Th-232 | 0.000E+00 | 0.0000 | 3.544E-07 | 0.0005 |
| U-234 | 0.000E+00 | 0.0000 | 3.268E-11 | 0.0000 |
| U-235 | 0.000E+00 | 0.0000 | 6.818E-07 | 0.0010 |
| U-238 | 0.000E+00 | 0.0000 | 3.038E-06 | 0.0043 |
| Total | 0.000E+00 | 0.0000 | 7.026E-04 | 1.0000 |

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

IRESRAD, Version 6.5 T^{1/2} Limit = 180 days 12/04/2013 15:00 Page 16
Intrinsic : SLDS Mean Background_ISOU Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\BKGD MEAN ISOU RESIDENT.RAD

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+01 years

| Radon Pathway | Radionuclides | | | | | | | |
|------------------|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
| Water-ind. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Water-dep. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Total | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

| Radio- Nuclide | Ground | | Inhalation | | Radon | | Plant | | Meat | | Milk | | Soil | |
|-------------------|-----------|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 1.415E-06 | 0.0020 | 6.725E-10 | 0.0000 | 0.000E+00 | 0.0000 | 7.311E-08 | 0.0001 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.068E-08 | 0.0001 |
| Pa-231 | 1.226E-05 | 0.0175 | 7.002E-09 | 0.0000 | 0.000E+00 | 0.0000 | 1.960E-06 | 0.0028 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.388E-07 | 0.0012 |
| Ra-226 | 3.502E-04 | 0.4985 | 2.620E-09 | 0.0000 | 0.000E+00 | 0.0000 | 7.486E-05 | 0.1066 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 5.585E-06 | 0.0079 |
| Ra-228 | 1.829E-05 | 0.0260 | 8.261E-10 | 0.0000 | 0.000E+00 | 0.0000 | 3.135E-06 | 0.0045 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.538E-07 | 0.0004 |
| Th-230 | 2.699E-06 | 0.0038 | 2.844E-09 | 0.0000 | 0.000E+00 | 0.0000 | 6.341E-07 | 0.0009 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.103E-07 | 0.0006 |
| Th-232 | 1.819E-04 | 0.2589 | 9.659E-09 | 0.0000 | 0.000E+00 | 0.0000 | 4.102E-05 | 0.0584 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.194E-06 | 0.0045 |
| U-235 | 6.562E-07 | 0.0009 | 4.084E-11 | 0.0000 | 0.000E+00 | 0.0000 | 1.371E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.243E-08 | 0.0000 |
| U-238 | 2.447E-06 | 0.0035 | 6.766E-10 | 0.0000 | 0.000E+00 | 0.0000 | 3.031E-07 | 0.0004 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.869E-07 | 0.0004 |
| Total | 5.695E-04 | 0.8112 | 2.434E-08 | 0.0000 | 0.000E+00 | 0.0000 | 1.220E-04 | 0.1736 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.065E-05 | 0.0152 |

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

| Radio- Nuclide | Water Dependent Pathways | | | | | | | | Meat | | Milk | | All pathways | |
|-------------------|--------------------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|--------------|--------|
| | Water | | Fish | | Radon | | Plant | | Meat | | Milk | | All pathways | |
| Radio- Nuclide | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.559E-06 | 0.0022 |
| Pa-231 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.508E-05 | 0.0215 |
| Ra-226 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.307E-04 | 0.6130 |
| Ra-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.168E-05 | 0.0309 |
| Th-230 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.746E-06 | 0.0053 |
| Th-232 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.261E-04 | 0.3218 |
| U-235 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.823E-07 | 0.0010 |
| U-238 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.038E-06 | 0.0043 |
| Total | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.026E-04 | 1.0000 |

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides
1RESRAD, Version 6.5 T_d Limit = 180 days 12/04/2013 15:00 Page 17
Intrinsic : SLDS Mean Background_ISOU Resident
File : C:\RESRAD\FAMILY\RESRAD\6.5\USERFILES\BKGD_MEAN_ISOU_RESIDENT.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/vr at t = 7.000E+01 years

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil and water-dependent water, fish, plant, meat, milk pathways

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of Radon and its Decay Products as pCi/yr at t= 7.000E+01 years
 Radionuclides

Water-ind. == Water-independent Water-dep. == Water-dependent
1RESRAD, Version 6.5 T½ Limit = 180 days 12/04/2013 15:00 Page 18
Intrinsic : SLDS Mean Background_ISOU Resident
File : C:\RESRAD FAMILY\RESRAD\6.5\USERFILES\BKGD MEAN ISOU FESIDENT.RAD

**Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 7.000E+01 years**

| | | | | | | | | | | | | |
|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| Ac-227 | 1.740E-05 | 0.0240 | 8.271E-09 | 0.0000 | 9.023E-07 | 0.0012 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.692E-07 | 0.0012 |
| Pa-231 | 1.795E-06 | 0.0025 | 1.968E-09 | 0.0000 | 1.358E-06 | 0.0019 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.054E-07 | 0.0004 |
| Pb-210 | 1.599E-07 | 0.0002 | 1.745E-09 | 0.0000 | 6.030E-05 | 0.0832 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.313E-06 | 0.0087 |
| Ra-226 | 3.397E-04 | 0.4687 | 1.558E-09 | 0.0000 | 3.853E-05 | 0.0532 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.858E-06 | 0.0026 |
| Ra-228 | 7.478E-05 | 0.1032 | 2.903E-10 | 0.0000 | 4.401E-05 | 0.0607 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.395E-06 | 0.0033 |
| Th-228 | 1.283E-04 | 0.1770 | 7.918E-09 | 0.0000 | 4.847E-07 | 0.0007 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.477E-07 | 0.0012 |
| Th-230 | 2.458E-08 | 0.0000 | 2.826E-09 | 0.0000 | 1.640E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.781E-07 | 0.0005 |
| Th-232 | 5.802E-09 | 0.0000 | 2.414E-09 | 0.0000 | 1.030E-07 | 0.0001 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.431E-07 | 0.0003 |
| U-234 | 1.281E-12 | 0.0000 | 1.902E-13 | 0.0000 | 5.536E-11 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.978E-11 | 0.0000 |
| U-235 | 6.282E-07 | 0.0009 | 3.890E-11 | 0.0000 | 1.306E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.188E-08 | 0.0000 |
| U-238 | 2.344E-06 | 0.0032 | 6.481E-10 | 0.0000 | 2.904E-07 | 0.0004 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.748E-07 | 0.0004 |
| Total | 5.651E-04 | 0.7797 | 2.768E-08 | 0.0000 | 1.462E-04 | 0.2016 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.350E-05 | 0.0186 |
| 0 | | | | | | | | | | | | |

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 7.000E+01 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Plant | | Meat | | Milk | | All Pathways** | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|----------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 1.918E-05 | 0.0265 |
| Pa-231 | 0.000E+00 | 0.0000 | 3.460E-06 | 0.0048 |
| Pb-210 | 0.000E+00 | 0.0000 | 6.677E-05 | 0.0921 |
| Ra-226 | 0.000E+00 | 0.0000 | 3.801E-04 | 0.5244 |
| Ra-228 | 0.000E+00 | 0.0000 | 1.212E-04 | 0.1672 |
| Th-228 | 0.000E+00 | 0.0000 | 1.296E-04 | 0.1789 |
| Th-230 | 0.000E+00 | 0.0000 | 5.695E-07 | 0.0008 |
| Th-232 | 0.000E+00 | 0.0000 | 3.544E-07 | 0.0005 |
| U-234 | 0.000E+00 | 0.0000 | 1.066E-10 | 0.0000 |
| U-235 | 0.000E+00 | 0.0000 | 6.532E-07 | 0.0009 |
| U-238 | 0.000E+00 | 0.0000 | 2.910E-06 | 0.0040 |
| Total | 0.000E+00 | 0.0000 | 7.248E-04 | 1.0000 |

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

1RESRAD, Version 6.5 T% Limit = 180 days 12/04/2013 15:00 Page 19
Inrisk : SLDS Mean Background_ISOU Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\BKGD MEAN ISOU RESIDENT.RAD

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 7.000E+01 years

| | | | | | | | | | | | | |
|---------------|--------|--------|--------|--------|--------|--------|--------|--------|--|--|--|--|
| 0 | | | | | | | | | | | | |
| Radon Pathway | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 | | | | |

| | | | | | | | | |
|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Water-ind. | 0.000E+00 |
| Water-dep. | 0.000E+00 |
| Total | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

0
0
0
Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction cf Total Risk at t= 7.000E+01 years

| Water Independent Pathways (Inhalation excludes radon) | | | | | | | | | | | | | | |
|--|-----------|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| Radio-Nuclide | Ground | | Inhalation | | Radon | | Plant | | Meat | | Milk | | Soil | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 1.883E-07 | 0.0003 | 8.954E-11 | 0.0000 | 0.000E+00 | 0.0000 | 9.733E-09 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.410E-09 | 0.0000 |
| Pa-231 | 1.900E-05 | 0.0262 | 1.015E-08 | 0.0000 | 0.000E+00 | 0.0000 | 2.250E-06 | 0.0031 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.165E-06 | 0.0016 |
| Ra-226 | 3.310E-04 | 0.4567 | 3.231E-09 | 0.0000 | 0.000E+00 | 0.0000 | 9.673E-05 | 0.1335 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.008E-06 | 0.0110 |
| Ra-228 | 1.311E-08 | 0.0000 | 5.970E-13 | 0.0000 | 0.000E+00 | 0.0000 | 2.197E-09 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.798E-10 | 0.0000 |
| Th-230 | 8.872E-06 | 0.0122 | 2.898E-09 | 0.0000 | 0.000E+00 | 0.0000 | 2.264E-06 | 0.0031 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 5.412E-07 | 0.0007 |
| Th-232 | 2.031E-04 | 0.2802 | 1.062E-08 | 0.0000 | 0.000E+00 | 0.0000 | 4.460E-05 | 0.0615 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.486E-06 | 0.0048 |
| U-235 | 6.305E-07 | 0.0009 | 4.014E-11 | 0.0000 | 0.000E+00 | 0.0000 | 1.338E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.202E-08 | 0.0000 |
| U-238 | 2.344E-06 | 0.0032 | 6.483E-10 | 0.0000 | 0.000E+00 | 0.0000 | 2.904E-07 | 0.0004 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.749E-07 | 0.0004 |
| Total | 5.651E-04 | 0.7797 | 2.768E-08 | 0.0000 | 0.000E+00 | 0.0000 | 1.462E-04 | 0.2016 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.350E-05 | 0.0186 |

0
0
0
Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 7.000E+01 years

| Water Dependent Pathways | | | | | | | | | | | | | | |
|--------------------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|--------------|--------|
| Radio-Nuclide | Water | | Fish | | Radon | | Plant | | Meat | | Milk | | All pathways | |
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 2.076E-07 | 0.0003 |
| Pa-231 | 0.000E+00 | 0.0000 | 2.243E-05 | 0.0309 |
| Ra-226 | 0.000E+00 | 0.0000 | 4.357E-04 | 0.6012 |
| Ra-228 | 0.000E+00 | 0.0000 | 1.548E-08 | 0.0000 |
| Th-230 | 0.000E+00 | 0.0000 | 1.168E-05 | 0.0161 |
| Th-232 | 0.000E+00 | 0.0000 | 2.512E-04 | 0.3465 |
| U-235 | 0.000E+00 | 0.0000 | 6.559E-07 | 0.0009 |
| U-238 | 0.000E+00 | 0.0000 | 2.910E-06 | 0.0040 |
| Total | 0.000E+00 | 0.0000 | 7.248E-04 | 1.0000 |

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides
1RESRAD, Version 6.5 T_{1/2} Limit = 180 days 12/04/2013 15:00 Page 20
Intrinsic : SLDS Mean Background_ISOU Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\BKGD MEAN ISOU RESIDENT.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t = 1.000E+02 years

| Radio-Nuclide | Water Independent Pathways (Inhalation w/o radon) | | | | | Water Dependent Pathways | | | | | Total Ingestion* |
|---------------|---|-----------|-----------|-----------|-----------|--------------------------|-----------|-----------|-----------|-----------|------------------|
| | Inhalation | Plant | Meat | Milk | Soil | Water | Fish | Plant | Meat | Milk | |
| Ac-227 | 1.337E-03 | 4.662E+01 | 0.000E+00 | 0.000E+00 | 2.525E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.187E+01 |
| Pa-231 | 1.426E-03 | 1.981E+02 | 0.000E+00 | 0.000E+00 | 2.692E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.250E+02 |
| Pb-210 | 4.282E-03 | 5.968E+02 | 0.000E+00 | 0.000E+00 | 8.084E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.776E+02 |
| Ra-226 | 4.449E-03 | 2.472E+03 | 0.000E+00 | 0.000E+00 | 8.400E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.556E+03 |
| Ra-228 | 1.850E-03 | 1.024E+03 | 0.000E+00 | 0.000E+00 | 3.494E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.059E+03 |
| Th-228 | 1.850E-03 | 3.825E+01 | 0.000E+00 | 0.000E+00 | 3.494E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.318E+01 |
| Th-230 | 3.304E-03 | 4.592E+01 | 0.000E+00 | 0.000E+00 | 6.239E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.083E+02 |
| Th-232 | 1.858E-03 | 2.583E+01 | 0.000E+00 | 0.000E+00 | 3.508E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.091E+01 |
| U-234 | 6.479E-07 | 2.250E-02 | 0.000E+00 | 0.000E+00 | 1.223E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 3.473E-02 |
| U-235 | 1.270E-04 | 4.411E+00 | 0.000E+00 | 0.000E+00 | 2.397E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.808E+00 |
| U-238 | 2.286E-03 | 7.939E+01 | 0.000E+00 | 0.000E+00 | 4.315E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.225E+02 |

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t = 1.000E+02 years

0

| Radon Pathway | Radionuclides | | | | | | | |
|---------------|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
| Water-ind. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Water-dep. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Total | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent
1RESRAD, Version 6.5 T½ Limit = 180 days 12/04/2013 15:00 Page 21

Inrisk : SLDS Mean Background_ISOU Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\BKGD MEAN ISOU RESIDENT.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t = 1.000E+02 years

0

| Radio-Nuclide | Water Independent Pathways (Inhalation excludes radon) | | | | | | | | | | |
|---------------|--|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|------------------|
| | Ground | | Inhalation | | Plant | | Meat | | Milk | | |
| risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 1.762E-05 | 0.0245 | 8.378E-09 | 0.0000 | 9.139E-07 | 0.0013 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.804E-07 0.0012 |
| Pa-231 | 1.756E-06 | 0.0024 | 1.925E-09 | 0.0000 | 1.328E-06 | 0.0018 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.987E-07 0.0004 |
| Pb-210 | 1.646E-07 | 0.0002 | 1.797E-09 | 0.0000 | 6.208E-05 | 0.0862 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.501E-06 0.0090 |
| Ra-226 | 3.334E-04 | 0.4632 | 1.529E-09 | 0.0000 | 3.782E-05 | 0.0525 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.823E-06 0.0025 |
| Ra-228 | 7.478E-05 | 0.1039 | 2.903E-10 | 0.0000 | 4.401E-05 | 0.0611 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.395E-06 0.0033 |

| | | | | | | | | | | | | |
|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| Th-228 | 1.283E-04 | 0.1782 | 7.918E-09 | 0.0000 | 4.847E-07 | 0.0007 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.476E-07 | 0.0012 |
| Th-230 | 2.458E-08 | 0.0000 | 2.825E-09 | 0.0000 | 1.639E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.780E-07 | 0.0005 |
| Th-232 | 5.802E-09 | 0.0000 | 2.414E-09 | 0.0000 | 1.030E-07 | 0.0001 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.431E-07 | 0.0003 |
| U-234 | 1.696E-12 | 0.0000 | 2.520E-13 | 0.0000 | 7.331E-11 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.593E-11 | 0.0000 |
| U-235 | 6.149E-07 | 0.0009 | 3.807E-11 | 0.0000 | 1.278E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.162E-08 | 0.0000 |
| U-238 | 2.295E-06 | 0.0032 | 6.344E-10 | 0.0000 | 2.842E-07 | 0.0004 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.690E-07 | 0.0004 |
| Total | 5.590E-04 | 0.7765 | 2.775E-08 | 0.0000 | 1.472E-04 | 0.2045 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.365E-05 | 0.0190 |

0

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Plant | | Meat | | Milk | | All Pathways** | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|----------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 1.942E-05 | 0.0270 |
| Pa-231 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.000C | 0.000E+00 | 0.0000 | 3.385E-06 | 0.0047 |
| Pb-210 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.000C | 0.000E+00 | 0.0000 | 6.875E-05 | 0.0955 |
| Ra-226 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.000C | 0.000E+00 | 0.0000 | 3.731E-04 | 0.5182 |
| Ra-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.000C | 0.000E+00 | 0.0000 | 1.212E-04 | 0.1683 |
| Th-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.000C | 0.000E+00 | 0.0000 | 1.296E-04 | 0.1801 |
| Th-230 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.000C | 0.000E+00 | 0.0000 | 5.693E-07 | 0.0008 |
| Th-232 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.000C | 0.000E+00 | 0.0000 | 3.544E-07 | 0.0005 |
| U-234 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.000C | 0.000E+00 | 0.0000 | 1.412E-10 | 0.0000 |
| U-235 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.000C | 0.000E+00 | 0.0000 | 6.394E-07 | 0.0009 |
| U-238 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.000C | 0.000E+00 | 0.0000 | 2.848E-06 | 0.0040 |
| Total | 0.000E+00 | 0.0000 | 7.198E-04 | 1.0000 |

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

1RESRAD, Version 6.5 T½ Limit = 180 days 12/04/2013 15:00 Page 22

Inrisk : SLDS Mean Background_ISOU Resident

File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\BKGD MEAN ISOU RESIDENT.RAD

| Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of Radon and its Decay Products at t= 1.000E+02 years | | | | | | | | |
|--|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Radionuclides | | | | | | | | |
| Radon Pathway | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
| Water-ind. | 0.000E+00 |
| Water-dep. | 0.000E+00 |
| Total | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

8

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t = 1.00E+02 years
 Water Independent Pathways (Inhalation excludes radon)

| Radio-Nuclide | Ground | | Inhalation | | Radon | | Plant | | Meat | | Milk | | Soil | |
|---------------|-----------|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|---------|
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 6.871E-08 | 0.0001 | 3.267E-11 | 0.0000 | 0.000E+00 | 0.0000 | 3.551E-09 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.433E-09 | 0.00000 |
| Pa-231 | 1.931E-05 | 0.0268 | 1.027E-08 | 0.0000 | 0.000E+00 | 0.0000 | 2.238E-06 | 0.0032 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.176E-06 | 0.0016 |
| Ra-226 | 3.218E-04 | 0.4470 | 3.224E-09 | 0.0000 | 0.000E+00 | 0.0000 | 9.692E-05 | 0.1346 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.088E-06 | 0.0112 |
| Ra-228 | 3.469E-10 | 0.0000 | 1.580E-14 | 0.0000 | 0.000E+00 | 0.0000 | 5.817E-11 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.758E-12 | 0.0000 |
| Tn-230 | 1.183E-05 | 0.0164 | 2.926E-09 | 0.0000 | 0.000E+00 | 0.0000 | 3.143E-06 | 0.0044 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.142E-07 | 0.0009 |
| Th-232 | 2.031E-04 | 0.2821 | 1.062E-08 | 0.0000 | 0.000E+00 | 0.0000 | 4.460E-05 | 0.0626 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.486E-06 | 0.0048 |
| U-235 | 6.182E-07 | 0.0009 | 3.986E-11 | 0.0000 | 0.000E+00 | 0.0000 | 1.322E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.183E-08 | 0.0000 |
| U-238 | 2.295E-06 | 0.0032 | 6.346E-10 | 0.0000 | 0.000E+00 | 0.0000 | 2.843E-07 | 0.0004 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.691E-07 | 0.0004 |
| Total | 5.590E-04 | 0.7765 | 2.775E-08 | 0.0000 | 0.000E+00 | 0.0000 | 1.472E-04 | 0.2045 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.365E-05 | 0.0190 |

Q

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p
and Fraction of Total Risk at t = 1.00E+02 years

Water Dependent Pathways

| | Water | | Fish | | Radon | | Plant | | Meat | | Milk | | All pathways | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|--------------|--------|
| Radio-Nuclide | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 7.573E-08 | 0.0001 |
| Pa-231 | 0.000E+00 | 0.0000 | 2.273E-05 | 0.0316 |
| Ra-226 | 0.000E+00 | 0.0000 | 4.268E-04 | 0.5929 |
| Ra-228 | 0.000E+00 | 0.0000 | 4.099E-10 | 0.0000 |
| Th-230 | 0.000E+00 | 0.0000 | 1.559E-05 | 0.0217 |
| Th-232 | 0.000E+00 | 0.0000 | 2.512E-04 | 0.3489 |
| U-235 | 0.000E+00 | 0.0000 | 6.433E-07 | 0.0009 |
| U-238 | 0.000E+00 | 0.0000 | 2.849E-06 | 0.0040 |
| Total | 0.000E+00 | 0.0000 | 7.198E-04 | 1.0000 |

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides
1RESRAD, Version 6.5 T_{1/2} Limit = 180 days 12/04/2013 15:00 Page 23
Intrinsic : SLDS Mean Background_ISOU Resident
File : C:\RESRAD FAMILY\RESRAD\6.5\USERFILES\BKGD_MEAN_ISOU_RESIDENT.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t = 3.000E+02 years

| Radio-Nuclide | Water Independent Pathways (Inhalation w/o radon) | | | | | Water Dependent Pathways | | | | | Total Ingestion* |
|---------------|---|-------|------|------|------|--------------------------|------|-------|------|------|------------------|
| | Inhalation | Plant | Meat | Milk | Soil | Water | Fish | Plant | Meat | Milk | |

| | | | | | | | | | | | | |
|--------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Ac-227 | 1.192E-03 | 4.155E+01 | 0.000E+00 | 0.000E+00 | 2.251E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.406E+01 |
| Pa-231 | 1.231E-03 | 1.710E+02 | 0.000E+00 | 0.000E+00 | 2.324E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.943E+02 |
| Pb-210 | 3.973E-03 | 5.536E+02 | 0.000E+00 | 0.000E+00 | 7.501E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.030E+00 | 0.000E+00 | 0.000E+00 | 6.286E+02 |
| Ra-226 | 3.944E-03 | 2.191E+03 | 0.000E+00 | 0.000E+00 | 7.446E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.030E+00 | 0.000E+00 | 0.000E+00 | 2.266E+03 |
| Ra-228 | 1.850E-03 | 1.024E+03 | 0.000E+00 | 0.000E+00 | 3.493E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.030E+00 | 0.000E+00 | 0.000E+00 | 1.059E+03 |
| Th-228 | 1.850E-03 | 3.824E+01 | 0.000E+00 | 0.000E+00 | 3.493E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.318E+01 |
| Th-230 | 3.298E-03 | 4.584E+01 | 0.000E+00 | 0.000E+00 | 6.227E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.081E+02 |
| Th-232 | 1.858E-03 | 2.582E+01 | 0.000E+00 | 0.000E+00 | 3.508E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.090E+01 |
| U-234 | 1.684E-06 | 5.850E-02 | 0.000E+00 | 0.000E+00 | 3.180E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 9.030E-02 |
| U-235 | 1.101E-04 | 3.823E+00 | 0.000E+00 | 0.000E+00 | 2.078E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 5.901E+00 |
| U-238 | 1.981E-03 | 6.882E+01 | 0.000E+00 | 0.000E+00 | 3.741E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.062E+02 |

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0
Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t = 3.000E+02 years
0 Radionuclides

| Radon Pathway | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Water-ind. | 0.000E+00 |
| Water-dep. | 0.000E+00 |
| Total | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent
1RESRAD, Version 6.5 T½ Limit = 180 days 12/04/2013 15:00 Page 24
Intrinsic : SLDS Mean Background_ISOU Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\BKGD MEAN ISOU RESIDENT.RAD

| Radio-Nuclide | Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p) and Fraction of Total Risk at t= 3.000E+02 years | | | | | | | | | | | |
|---------------|---|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | Water Independent Pathways (Inhalation excludes radon) | | | | | | | | | | | |
| | Ground | | Inhalation | | Plant | | Meat | | Milk | | Soil | |
| risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk |
| Ac-227 | 1.552E-05 | 0.0232 | 7.381E-09 | 0.0000 | 8.051E-07 | 0.0012 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.757E-07 | 0.0012 |
| Pa-231 | 1.516E-06 | 0.0023 | 1.662E-09 | 0.0000 | 1.147E-06 | 0.0017 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.580E-07 | 0.0004 |
| Pb-210 | 1.503E-07 | 0.0002 | 1.641E-09 | 0.0000 | 5.669E-05 | 0.0848 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 5.937E-06 | 0.0089 |
| Ra-226 | 2.957E-04 | 0.4424 | 1.356E-09 | 0.0000 | 3.354E-05 | 0.0502 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.617E-06 | 0.0024 |
| Ra-228 | 7.477E-05 | 0.1119 | 2.902E-10 | 0.0000 | 4.401E-05 | 0.0658 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.395E-06 | 0.0036 |
| Th-228 | 1.283E-04 | 0.1919 | 7.917E-09 | 0.0000 | 4.846E-07 | 0.0007 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.475E-07 | 0.0013 |
| Th-230 | 2.453E-08 | 0.0000 | 2.819E-09 | 0.0000 | 1.636E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.773E-07 | 0.0006 |
| Th-232 | 5.801E-09 | 0.0000 | 2.413E-09 | 0.0000 | 1.030E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.431E-07 | 0.0004 |
| U-234 | 4.027E-12 | 0.0000 | 5.982E-13 | 0.0000 | 1.741E-10 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.565E-10 | 0.0000 |
| U-235 | 5.330E-07 | 0.0008 | 3.300E-11 | 0.0000 | 1.108E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.008E-08 | 0.0000 |
| U-238 | 1.989E-06 | 0.0030 | 5.499E-10 | 0.0000 | 2.463E-07 | 0.0004 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.332E-07 | 0.0003 |

| | | | | | | | | | | | | |
|-------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| Total | 5.185E-04 | 0.7757 | 2.606E-08 | 0.0000 | 1.372E-04 | 0.2053 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.269E-05 | 0.0190 |
|-------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|

0

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Plant | | Meat | | Milk | | All Pathways** | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|----------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.000C | 0.000E+00 | 0.0000 | 1.711E-05 | 0.0256 |
| Pa-231 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.000C | 0.000E+00 | 0.0000 | 2.923E-06 | 0.0044 |
| Pb-210 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.000G | 0.000E+00 | 0.0000 | 6.278E-05 | 0.0939 |
| Ra-226 | 0.000E+00 | 0.0000 | 0.000E+00 | C.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.309E-04 | 0.4950 |
| Ra-228 | 0.000E+00 | 0.0000 | 0.000E+00 | C.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.212E-04 | 0.1813 |
| Th-228 | 0.000E+00 | 0.0000 | 1.296E-04 | 0.1939 |
| Th-230 | 0.000E+00 | 0.0000 | 5.682E-07 | 0.0009 |
| Th-232 | 0.000E+00 | 0.0000 | 3.543E-07 | 0.0005 |
| U-234 | 0.000E+00 | 0.0000 | 3.352E-10 | 0.0000 |
| U-235 | 0.000E+00 | 0.0000 | 5.542E-07 | 0.0008 |
| U-238 | 0.000E+00 | 0.0000 | 2.469E-06 | 0.0037 |
| Total | 0.000E+00 | 0.0000 | 6.684E-04 | 1.0000 |

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

1RESRAD, Version 6.5 T% Limit = 180 days 12/04/2013 15:00 Page 25

Intrinsic : SLDS Mean Background_ISOU Resident

File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\BKGD MEAN ISOU RESIDENT.RAD

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+02 years

0

Radionuclides

| Radon Pathway | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Water-ind. | 0.000E+00 |
| Water-dep. | 0.000E+00 |
| Total | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

0

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existert Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.00CE+02 years

0 Water Independent Pathways (Inhalation excludes radon)

0

Ground Inhalation Radon Plant Meat Milk Soil

0

| Radio- | Ground | Inhalation | Radon | Plant | Meat | Milk | Soil |
|--------|--------|------------|-------|-------|------|------|------|
|--------|--------|------------|-------|-------|------|------|------|

| Nuclide | risk | fract. |
|---------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| Ac-227 | 8.279E-11 | 0.0000 | 3.936E-14 | 0.0000 | 0.000E+00 | C.0000 | 4.279E-12 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.137E-12 | 0.0000 |
| Pa-231 | 1.703E-05 | 0.0255 | 9.038E-09 | 0.0000 | 0.000E+00 | C.0000 | 1.951E-06 | 0.0029 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.033E-06 | 0.0015 |
| Ra-226 | 2.664E-04 | 0.3985 | 2.716E-09 | 0.0000 | 0.000E+00 | C.0000 | 8.183E-05 | 0.1224 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.864E-06 | 0.0103 |
| Ra-228 | 1.060E-20 | 0.0000 | 4.827E-25 | 0.0000 | 0.000E+00 | 0.0000 | 1.777E-21 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.454E-22 | 0.0000 |
| Th-230 | 2.952E-05 | 0.0442 | 3.101E-09 | 0.0000 | 0.000E+00 | 0.0000 | 8.560E-06 | 0.0128 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.067E-06 | 0.0016 |
| Th-232 | 2.031E-04 | 0.3038 | 1.062E-08 | 0.0000 | 0.000E+00 | 0.0000 | 4.459E-05 | 0.0667 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.486E-06 | 0.0052 |
| U-235 | 5.422E-07 | 0.0008 | 3.795E-11 | 0.0000 | 0.000E+00 | 0.0000 | 1.219E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.065E-08 | 0.0000 |
| U-238 | 1.989E-06 | 0.0030 | 5.505E-10 | 0.0000 | 0.000E+00 | 0.0000 | 2.465E-07 | 0.0004 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.333E-07 | 0.0003 |
| Total | 5.185E-04 | 0.7757 | 2.606E-08 | 0.0000 | 0.000E+00 | 0.0000 | 1.372E-04 | 0.2053 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.269E-05 | 0.0190 |

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.0COE+02 years

Water Dependent Pathways

| | Water | | Fish | | Radon | | Plant | | Meat | | Milk | | All pathways | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|--------------|--------|
| Radio-Nuclide | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 9.124E-11 | 0.0000 |
| Pa-231 | 0.000E+00 | 0.0000 | 2.002E-05 | 0.0300 |
| Ra-226 | 0.000E+00 | 0.0000 | 3.551E-04 | 0.5312 |
| Ra-228 | 0.000E+00 | 0.0000 | 1.252E-20 | 0.0000 |
| Th-230 | 0.000E+00 | 0.0000 | 3.915E-05 | 0.0586 |
| Th-232 | 0.000E+00 | 0.0000 | 2.512E-04 | 0.3757 |
| U-235 | 0.000E+00 | 0.0000 | 5.651E-07 | 0.0008 |
| U-238 | 0.000E+00 | 0.0000 | 2.469E-06 | 0.0037 |
| Total | 0.000E+00 | 0.0000 | 6.684E-04 | 1.0000 |

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides
1RESRAD, Version 6.5 T_{1/2} Limit = 180 days 12/04/2013 15:00 Page 26
Intrinsic : SLDS Mean Background_ISOU Resident
File : C:\RESRAD FAMILY\RESRAD\6.5\USERFILES\BKGD MEAN ISOU RESIDENT.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pcCi/yr at t = 1.000E+03 years

| | | | | | | | | | | | | |
|--------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Th-228 | 1.849E-03 | 3.823E+01 | 0.000E+00 | 0.000E+00 | 3.492E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.315E+01 |
| Th-230 | 3.276E-03 | 4.553E+01 | 0.000E+00 | 0.000E+00 | 6.185E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.074E+02 |
| Th-232 | 1.857E-03 | 2.581E+01 | 0.000E+00 | 0.000E+00 | 3.506E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.088E+01 |
| U-234 | 3.401E-06 | 1.181E-01 | 0.000E+00 | 0.000E+00 | 6.421E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.823E-01 |
| U-235 | 6.674E-05 | 2.318E+00 | 0.000E+00 | 0.000E+00 | 1.260E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 3.578E+00 |
| U-238 | 1.201E-03 | 4.173E+01 | 0.000E+00 | 0.000E+00 | 2.268E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.441E+01 |

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0 Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t = 1.000E+03 years

| Radon Pathway | Radionuclides | | | | | | | |
|---------------|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
| Water-ind. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Water-dep. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Total | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent
1RESRAD, Version 6.5 T½ Limit = 180 days 12/04/2013 15:00 Page 27
Intrinsic : SLDS Mean Background_ISOU Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\BKGD MEAN ISOU RESIDENT.RAD

| Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p) and Fraction of Total Risk at t= 1.000E+03 years | | | | | | | | | | | | |
|---|-----------|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| Water Independent Pathways (Inhalation excludes radon) | | | | | | | | | | | | |
| Radio-Nuclide | Ground | | Inhalation | | Plant | | Meat | | Milk | | Soil | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 9.288E-06 | 0.0171 | 4.416E-09 | 0.0000 | 4.817E-07 | 0.0009 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.641E-07 | 0.0009 |
| Pa-231 | 9.071E-07 | 0.0017 | 9.944E-10 | 0.0000 | 6.861E-07 | 0.0013 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.543E-07 | 0.0003 |
| Pb-210 | 1.051E-07 | 0.0002 | 1.147E-09 | 0.0000 | 3.964E-05 | 0.0732 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.152E-06 | 0.0077 |
| Ra-226 | 2.078E-04 | 0.3835 | 9.532E-10 | 0.0000 | 2.357E-05 | 0.0435 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.136E-06 | 0.0021 |
| Ra-228 | 7.474E-05 | 0.1379 | 2.901E-10 | 0.0000 | 4.399E-05 | 0.0812 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.394E-06 | 0.0044 |
| Th-228 | 1.282E-04 | 0.2367 | 7.914E-09 | 0.0000 | 4.844E-07 | 0.0009 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.472E-07 | 0.0016 |
| Th-230 | 2.437E-08 | 0.0000 | 2.800E-09 | 0.0000 | 1.625E-07 | 0.0003 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.748E-07 | 0.0007 |
| Th-232 | 5.799E-09 | 0.0000 | 2.412E-09 | 0.0000 | 1.030E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.430E-07 | 0.0004 |
| U-234 | 7.861E-12 | 0.0000 | 1.168E-12 | 0.0000 | 3.398E-10 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.056E-10 | 0.0000 |
| U-235 | 3.232E-07 | 0.0006 | 2.001E-11 | 0.0000 | 6.718E-09 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.110E-09 | 0.0000 |
| U-238 | 1.206E-06 | 0.0022 | 3.334E-10 | 0.0000 | 1.494E-07 | 0.0003 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.414E-07 | 0.0003 |
| Total | 4.226E-04 | 0.7800 | 2.128E-08 | 0.0000 | 1.093E-04 | 0.2017 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.913E-06 | 0.0183 |

0 Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Plant | | Meat | | Milk | | All Pathways** | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|----------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 1.024E-05 | 0.0189 |
| Pa-231 | 0.000E+00 | 0.0000 | 1.748E-06 | 0.0032 |
| Pb-210 | 0.000E+00 | 0.0000 | 4.390E-05 | 0.0810 |
| Ra-226 | 0.000E+00 | 0.0000 | 2.325E-04 | 0.4291 |
| Ra-228 | 0.000E+00 | 0.0000 | 1.211E-04 | 0.2235 |
| Th-228 | 0.000E+00 | 0.0000 | 1.296E-04 | 0.2391 |
| Th-230 | 0.000E+00 | 0.0000 | 5.644E-07 | 0.0010 |
| Th-232 | 0.000E+00 | 0.0000 | 3.542E-07 | 0.0007 |
| U-234 | 0.000E+00 | 0.0000 | 6.544E-10 | 0.0000 |
| U-235 | 0.000E+00 | 0.0000 | 3.360E-07 | 0.0006 |
| U-238 | 0.000E+00 | 0.0000 | 1.497E-06 | 0.0028 |
| Total | 0.000E+00 | 0.0000 | 5.418E-04 | 1.0000 |

** Sum of water independent ground, inhalation, plant, meat, milk, soil and water dependent water, fish, plant, meat, milk pathways

1RESRAD, Version 6.5 T_½ Limit = 180 days 12/04/2013 15:00 Page 28

Intrinsic : SLDS Mean Background ISOU Resident

File#: C:\BESRAD FAMILY\BESRAD\6.5\USERFILES\BKGD MEAN ISOU RESIDENT.BAD

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
 Radon and its Decay Products at t= 1.000E+03 years
 Radionuclides

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t = 1.00E+03 years

| | | | | | | | | | | | | | | |
|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| Th-230 | 7.041E-05 | 0.1299 | 3.499E-09 | 0.0000 | 0.000E+00 | 0.0000 | 2.113E-05 | 0.0390 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.119E-06 | 0.0039 |
| Th-232 | 2.030E-04 | 0.3746 | 1.062E-08 | 0.0000 | 0.000E+00 | 0.0000 | 4.458E-05 | 0.0823 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.484E-06 | 0.0064 |
| U-235 | 3.423E-07 | 0.0006 | 3.017E-11 | 0.0000 | 0.000E+00 | 0.0000 | 8.939E-09 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.274E-09 | 0.0000 |
| U-238 | 1.206E-06 | 0.0022 | 3.346E-10 | 0.0000 | 0.000E+00 | 0.0000 | 1.498E-07 | 0.0003 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.417E-07 | 0.0003 |
| Total | 4.226E-04 | 0.7800 | 2.128E-08 | 0.0000 | 0.000E+00 | 0.0000 | 1.093E-04 | 0.2017 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.913E-06 | 0.0183 |

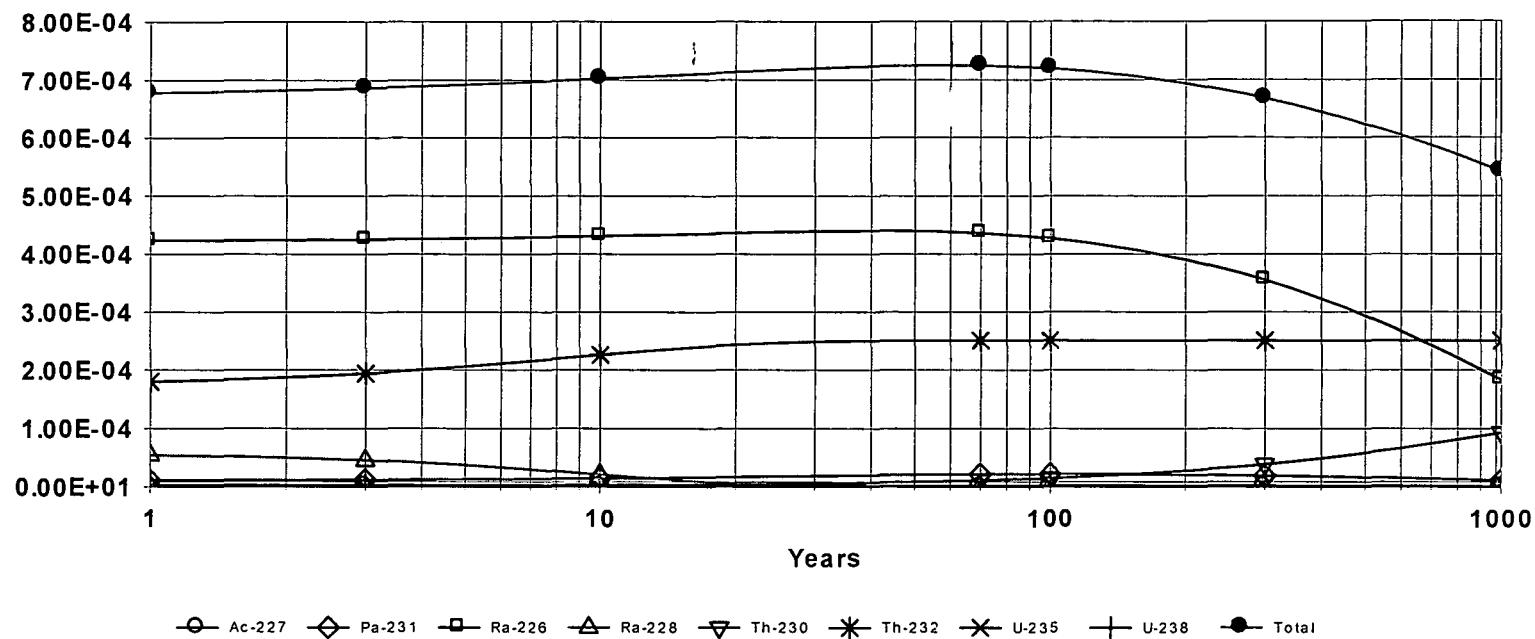
C
Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Radon | | Plant | | Meat | | Milk | | All pathways | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|--------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 5.540E-21 | 0.0000 |
| Pa-231 | 0.000E+00 | 0.0000 | 1.196E-05 | 0.0221 |
| Ra-226 | 0.000E+00 | 0.0000 | 1.833E-04 | 0.3383 |
| Ra-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 |
| Th-230 | 0.000E+00 | 0.0000 | 9.366E-05 | 0.1729 |
| Th-232 | 0.000E+00 | 0.0000 | 2.510E-04 | 0.4633 |
| U-235 | 0.000E+00 | 0.0000 | 3.585E-07 | 0.0007 |
| U-238 | 0.000E+00 | 0.0000 | 1.498E-06 | 0.0028 |
| Total | 0.000E+00 | 0.0000 | 5.418E-04 | 1.0000 |

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

EXCESS CANCER RISK: All Nuclides Summed, All Pathways Summed



C:\RESRAD_FAMILY\RESRAD6.5\USERFILES\BGD MEAN ISO RESIDENT.RAD 12/04/2013 15:00 GRAPHICS.ASC Includes All Pathways

Attachment D

**RESRAD Output for Average Background Cancer Risks Calculated for Hypothetical
Resident Gardener Exposures to Accessible Soil**

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Intrinsic : SLDS Background Mean Accessible Soil Resident
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Part III: Intake Quantities and Health Risk Factors

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| Amount of Intake Quantities and Excess Cancer Risks | |
| Time= 0.000E+00 | 5 |
| Time= 1.000E+00 | 9 |
| Time= 3.000E+00 | 13 |
| Time= 1.000E+01 | 17 |
| Time= 7.000E+01 | 21 |
| Time= 1.000E+02 | 25 |
| Time= 3.000E+02 | 29 |
| Time= 1.000E+03 | 33 |

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Intrinsic : SLDS Background Mean Accessible Soil Resident
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Cancer Risk Slope Factors Summary Table
Risk Library: HEAST 2001 Morbidity

| 0 Menu | Parameter | Current Value | Base Case* | Parameter Name |
|-----------|--|------------------|---------------|-------------------|
| Sf-1 | Ground external radiation slope factors, 1/yr per (pCi/g): | | | |
| Sf-1 | Ac-227+D | 1.47E-06 | 3.48E-10 | SLPF(1,1) |
| Sf-1 | Pa-231 | 1.39E-07 | 1.39E-07 | SLPF(2,1) |
| Sf-1 | Pb-210+D | 4.21E-09 | 1.41E-09 | SLPF(3,1) |
| Sf-1 | Ra-226+D | 8.49E-06 | 2.29E-08 | SLPF(4,1) |
| Sf-1 | Ra-228+D | 4.53E-06 | 0.00E+00 | SLPF(5,1) |
| Sf-1 | Th-228+D | 7.76E-06 | 5.59E-09 | SLPF(6,1) |
| Sf-1 | Th-230 | 8.19E-10 | 8.19E-10 | SLPF(7,1) |
| Sf-1 | Th-232 | 3.42E-10 | 3.42E-10 | SLPF(8,1) |
| Sf-1 | U-231 | 2.52E-10 | 2.52E-10 | SLPF(9,1) |
| Sf-1 | U-235+D | 5.43E-07 | 5.18E-07 | SLPF(10,1) |
| Sf-1 | U-238 | 4.99E-11 | 4.99E-11 | SLPF(11,1) |
| Sf-1 | U-238+D | 1.14E-07 | 4.99E-11 | SLPF(12,1) |
| Sf-2 | Inhalation, slope factors, 1/(pCi): | | | |
| Sf-2 | Ac-227+D | 2.09E-07 | 1.49E-07 | SLPF(1,2) |
| Sf-2 | Pa-231 | 4.55E-08 | 4.55E-08 | SLPF(2,2) |
| Sf-2 | Pb-210+D | 1.39E-08 | 2.77E-09 | SLPF(3,2) |
| Sf-2 | Ra-226+D | 1.16E-08 | 1.15E-08 | SLPF(4,2) |
| Sf-2 | Ra-223+D | 5.23E-09 | 5.18E-09 | SLPF(5,2) |
| Sf-2 | Th-223+D | 1.43E-07 | 1.32E-07 | SLPF(6,2) |

| | | | | |
|------|--|----------|----------|-------------|
| Sf-2 | Th-230 | 2.85E-08 | 2.85E-08 | SLPF(7,2) |
| Sf-2 | Th-232 | 4.33E-08 | 4.33E-08 | SLPF(8,2) |
| Sf-2 | U-234 | 1.14E-08 | 1.14E-08 | SLPF(9,2) |
| Sf-2 | U-235+D | 1.01E-08 | 1.01E-08 | SLPF(10,2) |
| Sf-2 | U-238 | 9.32E-09 | 9.32E-09 | SLPF(11,2) |
| Sf-2 | U-238+D | 9.35E-09 | 9.32E-09 | SLPF(12,2) |
| Sf-3 | Food ingestion, slope factors, 1/(pCi): | | | |
| Sf-3 | Ac-227+D | 6.53E-10 | 2.45E-10 | SLPF(1,3) |
| Sf-3 | Pa-231 | 2.26E-10 | 2.26E-10 | SLPF(2,3) |
| Sf-3 | Pb-210+D | 3.44E-09 | 1.18E-09 | SLPF(3,3) |
| Sf-3 | Ra-226+D | 5.15E-10 | 5.14E-10 | SLPF(4,3) |
| Sf-3 | Ra-228+D | 1.43E-09 | 1.43E-09 | SLPF(5,3) |
| Sf-3 | Th-228+D | 4.22E-10 | 1.48E-10 | SLPF(6,3) |
| Sf-3 | Th-230 | 1.19E-10 | 1.19E-10 | SLPF(7,3) |
| Sf-3 | Th-232 | 1.33E-10 | 1.33E-10 | SLPF(8,3) |
| Sf-3 | U-234 | 9.55E-11 | 9.55E-11 | SLPF(9,3) |
| Sf-3 | U-235+D | 9.76E-11 | 9.44E-11 | SLPF(10,3) |
| Sf-3 | U-238 | 8.66E-11 | 8.66E-11 | SLPF(11,3) |
| Sf-3 | U-238+D | 1.21E-10 | 8.66E-11 | SLPF(12,3) |
| Sf-3 | Water ingestion, slope factors, 1/(pCi): | | | |
| Sf-3 | Ac-227+D | 4.86E-10 | 2.01E-10 | SLPF(1,4) |
| Sf-3 | Pa-231 | 1.73E-10 | 1.73E-10 | SLPF(2,4) |
| Sf-3 | Pb-210+D | 1.27E-09 | 8.81E-10 | SLPF(3,4) |
| Sf-3 | Ra-226+D | 3.86E-10 | 3.85E-10 | SLPF(4,4) |
| Sf-3 | Ra-228+D | 1.04E-09 | 1.04E-09 | SLPF(5,4) |
| Sf-3 | Th-228+D | 3.00E-10 | 1.07E-10 | SLPF(6,4) |
| Sf-3 | Th-230 | 9.10E-11 | 9.10E-11 | SLPF(7,4) |

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Intrinsic : SLDS Background Mean Accessible Soil Resident
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Cancer Risk Slope Factors Summary Table (continued)
 Risk Library: HEAST 2001 Morbidity

| 0 Menu | Parameter | Current Value | Base Case* | Parameter Name |
|-----------|---|---------------|------------|----------------|
| Sf-3 | Th-232 | 1.01E-10 | 1.01E-10 | SLPF(8,4) |
| Sf-3 | U-234 | 7.07E-11 | 7.07E-11 | SLPF(9,4) |
| Sf-3 | U-235+D | 7.18E-11 | 6.96E-11 | SLPF(10,4) |
| Sf-3 | U-238 | 6.40E-11 | 6.40E-11 | SLPF(11,4) |
| Sf-3 | U-238+D | 8.71E-11 | 6.40E-11 | SLPF(12,4) |
| Sf-3 | Soil ingestion, slope factors, 1/(pCi): | | | |
| Sf-3 | Ac-227+D | 1.16E-09 | 3.81E-10 | SLPF(1,5) |
| Sf-3 | Pa-231 | 3.74E-10 | 3.74E-10 | SLPF(2,5) |
| Sf-3 | Pb-210+D | 2.66E-09 | 1.84E-09 | SLPF(3,5) |
| Sf-3 | Ra-226+D | 7.30E-10 | 7.29E-10 | SLPF(4,5) |
| Sf-3 | Ra-228+D | 2.29E-09 | 2.28E-09 | SLPF(5,5) |

| | | | | |
|-------|--|----------|----------|-------------|
| Sf-3 | Th-228+D | 8.09E-10 | 2.89E-10 | SLPF(6,5) |
| Sf-3 | Th-230 | 2.02E-10 | 2.02E-10 | SLPF(7,5) |
| Sf-3 | Th-232 | 2.31E-10 | 2.31E-10 | SLPF(8,5) |
| Sf-3 | U-234 | 1.58E-10 | 1.58E-10 | SLPF(9,5) |
| Sf-3 | U-235+D | 1.63E-10 | 1.57E-10 | SLPF(10,5) |
| Sf-3 | U-238 | 1.43E-10 | 1.43E-10 | SLPF(11,5) |
| Sf-3 | U-238+D | 2.10E-10 | 1.43E-10 | SLPF(12,5) |
| Sf-Rn | Radon Inhalation slope factors, 1/(pCi): | | | |
| Sf-Rn | Rn-222 | 1.80E-12 | 1.80E-12 | SLPFRN(1,1) |
| Sf-Rn | Po-218 | 3.70E-12 | 3.70E-12 | SLPFRN(1,2) |
| Sf-Rn | Pb-214 | 6.20E-12 | 6.20E-12 | SLPFRN(1,3) |
| Sf-Rn | Bi-214 | 1.50E-11 | 1.50E-11 | SLPFRN(1,4) |
| Sf-Rn | Rn-220 | 1.90E-13 | 1.90E-13 | SLPFRN(2,1) |
| Sf-Rn | Po-216 | 3.00E-15 | 3.00E-15 | SLPFRN(2,2) |
| Sf-Rn | Pb-212 | 3.90E-11 | 3.90E-11 | SLPFRN(2,3) |
| Sf-Rn | Bi-212 | 3.70E-11 | 3.70E-11 | SLPFRN(2,4) |
| Sf-Rn | Radon K factors, (mrem/WLM) : | | | |
| Sf-Rn | Rn-222 Indoor | 7.60E+02 | 7.60E+02 | KFACTR(1,1) |
| Sf-Rn | Rn-222 Outdoor | 5.70E+02 | 5.70E+02 | KFACTR(1,2) |
| Sf-Rn | Rn-220 Indoor | 1.50E+02 | 1.50E+02 | KFACTR(2,1) |
| Sf-Rn | Rn-220 Outdoor | 2.50E+02 | 2.50E+02 | KFACTR(2,2) |

*Base Case means Default.Lib w/o Associate Nuclide contributions.
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Intrinsic : SLDS Background Mean Accessible Soil Resident
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Risk Slope and Environmental Transport Factors for the Ground Pathway

| | | | | | | | | | | | |
|--------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Po-212 | 0.000E+00 |
| Po-214 | 3.860E-10 | 5.040E-01 |
| Po-215 | 7.480E-10 | 5.067E-01 |
| Po-216 | 7.870E-11 | 5.056E-01 |
| Po-218 | 4.260E-11 | 5.056E-01 |
| Ra-223 | 4.340E-07 | 5.113E-01 |
| Ra-224 | 3.720E-08 | 5.115E-01 |
| Ra-226 | 2.290E-08 | 5.128E-01 |
| Ra-228 | 0.000E+00 |
| Rn-219 | 2.250E-07 | 5.094E-01 |
| Rn-220 | 1.700E-09 | 5.045E-01 |
| Rn-222 | 1.740E-09 | 5.045E-01 |
| Th-227 | 3.780E-07 | 5.119E-01 |
| Th-228 | 5.590E-09 | 5.142E-01 |
| Th-230 | 8.190E-10 | 5.162E-01 |
| Th-231 | 2.450E-08 | 5.168E-01 |
| Th-232 | 3.420E-10 | 5.188E-01 |
| Th-234 | 1.630E-08 | 5.174E-01 |
| Tl-207 | 1.520E-08 | 5.062E-01 |
| Tl-208 | 1.760E-05 | 5.075E-01 |
| Tl-210 | 0.000E+00 | 5.384E-01 |
| U-234 | 2.520E-10 | 5.192E-01 |
| U-235 | 5.180E-07 | 5.125E-01 |
| U-238 | 4.990E-11 | 5.337E-01 |

* - Units are 1/yr per (pCi/g) at infinite depth and area. Multiplication by ETG(i,t) converts to site conditions.

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Inrisk : SLDS Background Mean Accessible Soil Resident

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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 0.000E+00 years

| Radio-Nuclide | Water Independent Pathways (Inhalation w/o radon) | | | | | Water Dependent Pathways | | | | | Total Ingestion* |
|---------------|---|-----------|-----------|-----------|-----------|--------------------------|-----------|-----------|-----------|-----------|------------------|
| | Inhalation | Plant | Meat | Milk | Soil | Water | Fish | Plant | Meat | Milk | |
| Ac-227 | 2.387E-04 | 8.290E+00 | 0.000E+00 | 0.000E+00 | 4.506E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.280E+01 |
| Pa-231 | 1.534E-03 | 2.131E+02 | 0.000E+00 | 0.000E+00 | 2.897E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.421E+02 |
| Pb-210 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Ra-226 | 4.740E-03 | 2.633E+03 | 0.000E+00 | 0.000E+00 | 8.948E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.723E+03 |
| Ra-228 | 1.620E-03 | 8.999E+02 | 0.000E+00 | 0.000E+00 | 3.058E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 9.304E+02 |
| Th-228 | 1.978E-03 | 2.749E+01 | 0.000E+00 | 0.000E+00 | 3.734E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.482E+01 |
| Th-230 | 3.307E-03 | 4.597E+01 | 0.000E+00 | 0.000E+00 | 6.245E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.084E+02 |
| Th-232 | 1.858E-03 | 2.583E+01 | 0.000E+00 | 0.000E+00 | 3.509E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.091E+01 |
| U-234 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| U-235 | 1.364E-04 | 4.737E+00 | 0.000E+00 | 0.000E+00 | 2.575E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.312E+00 |
| U-238 | 2.472E-03 | 8.586E+01 | 0.000E+00 | 0.000E+00 | 4.667E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.325E+02 |

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil

and water-dependent water, fish, plant, meat, milk pathways

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t = 0.000E+00 years

Radionuclides

| Radon Pathway | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Water-ind. | 0.000E+00 |
| Water-dep. | 0.000E+00 |
| Total | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E-00 | 0.000E+00 | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent
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Inrisk : SLDS Background Mean_Accessible Soil Resident
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

| Radio-Nuclide | Ground | | Inhalation | | Plant | | Meat | | Milk | | Soil | |
|---------------|-----------|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 9.005E-06 | 0.0131 | 4.281E-09 | 0.0000 | 4.688E-07 | 0.0007 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.499E-07 | 0.0007 |
| Pa-231 | 1.890E-06 | 0.0028 | 2.072E-09 | 0.0000 | 1.429E-06 | 0.0021 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.215E-07 | 0.0005 |
| Pb-210 | 6.263E-08 | 0.0001 | 6.836E-10 | 0.0000 | 2.376E-05 | 0.0347 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.474E-06 | 0.0036 |
| Ra-226 | 3.551E-04 | 0.5182 | 1.629E-09 | 0.0000 | 4.028E-05 | 0.0588 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.942E-06 | 0.0028 |
| Ra-228 | 7.228E-05 | 0.1055 | 2.806E-10 | 0.0000 | 4.254E-05 | 0.0621 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.315E-06 | 0.0034 |
| Th-228 | 1.249E-04 | 0.1823 | 7.708E-09 | 0.0000 | 4.700E-07 | 0.0007 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.251E-07 | 0.0012 |
| Th-230 | 2.450E-08 | 0.0000 | 2.827E-09 | 0.0000 | 1.641E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.784E-07 | 0.0006 |
| Th-232 | 5.802E-09 | 0.0000 | 2.414E-09 | 0.0000 | 1.031E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.431E-07 | 0.0004 |
| U-234 | 2.386E-13 | 0.0000 | 3.544E-14 | 0.0000 | 1.031E-11 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.274E-12 | 0.0000 |
| U-235 | 6.605E-07 | 0.0010 | 4.089E-11 | 0.0000 | 1.373E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.249E-08 | 0.0000 |
| U-238 | 2.4E2E-05 | 0.0036 | 6.861E-10 | 0.0000 | 3.074E-07 | 0.0004 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.909E-07 | 0.0004 |
| Total | 5.664E-04 | 0.8266 | 2.262E-08 | 0.0000 | 1.095E-04 | 0.1599 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.252E-06 | 0.0135 |

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Plant | | Meat | | Milk | | All Pathways** | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|----------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 9.928E-06 | 0.0145 |
| Pa-231 | 0.000E+00 | 0.0000 | 3.643E-06 | 0.0053 |

| | | | | | | | | | | | | |
|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| Pb-210 | 0.000E+00 | 0.0000 | 2.630E-05 | 0.0384 |
| Ra-226 | 0.000E+00 | 0.0000 | 3.973E-04 | 0.5798 |
| Ra-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | C.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.171E-04 | 0.1710 |
| Th-228 | 0.000E+00 | 0.0000 | 1.262E-04 | 0.1842 |
| Th-230 | 0.000E+00 | 0.0000 | 5.699E-07 | 0.0008 |
| Th-232 | 0.000E+00 | 0.0000 | 3.544E-07 | 0.0005 |
| U-234 | 0.000E+00 | 0.0000 | 1.986E-11 | 0.0000 |
| U-235 | 0.000E+00 | 0.0000 | 6.867E-07 | 0.0010 |
| U-238 | 0.000E+00 | 0.0000 | 3.081E-06 | 0.0045 |
| Total | 0.000E+00 | 0.0000 | 6.852E-04 | 1.0000 |

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

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Intrinsic : SLDS Background Mean Accessible Soil Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\BKGD MEAN ACC RESIDENT.RAD

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 0.000E+00 years

| Radionuclides | | | | | | | | |
|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Radon Pathway | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
| Water-ind. | 0.000E+00 |
| Water-dep. | 0.000E+00 |
| Total | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

0
0
Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

| Water Independent Pathways (Inhalation excludes radon) | | | | | | | | | | | | | | |
|--|-----------|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| Radio-Nuclide | Ground | | Inhalation | | Radon | | Plant | | Meat | | Milk | | Soil | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 1.980E-06 | 0.0029 | 9.412E-10 | 0.0000 | 0.000E+00 | 0.0000 | 1.023E-07 | 0.0001 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.891E-08 | 0.0001 |
| Pa-231 | 8.915E-06 | 0.0130 | 5.412E-09 | 0.0000 | 0.000E+00 | 0.0000 | 1.796E-06 | 0.0026 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.725E-07 | 0.0010 |
| Ra-226 | 3.535E-04 | 0.5160 | 2.303E-09 | 0.0000 | 0.000E+00 | 0.0000 | 6.378E-05 | 0.0931 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.399E-06 | 0.0064 |
| Ra-228 | 4.724E-05 | 0.0689 | 1.901E-09 | 0.0000 | 0.000E+00 | 0.0000 | 1.048E-05 | 0.0153 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.582E-07 | 0.0011 |
| Th-228 | 1.262E-05 | 0.0184 | 7.786E-10 | 0.0000 | 0.000E+00 | 0.0000 | 3.204E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.335E-08 | 0.0001 |
| Th-230 | 1.635E-06 | 0.0024 | 2.837E-09 | 0.0000 | 0.000E+00 | 0.0000 | 4.237E-07 | 0.0006 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.952E-07 | 0.0006 |
| Th-232 | 1.373E-04 | 0.2004 | 7.723E-09 | 0.0000 | 0.000E+00 | 0.0000 | 3.260E-05 | 0.0476 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.542E-06 | 0.0037 |
| U-235 | 6.607E-07 | 0.0010 | 4.102E-11 | 0.0000 | 0.000E+00 | 0.0000 | 1.378E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.250E-08 | 0.0000 |
| U-238 | 2.482E-06 | 0.0036 | 6.861E-10 | 0.0000 | 0.000E+00 | 0.0000 | 3.074E-07 | 0.0004 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.909E-07 | 0.0004 |
| Total | 5.664E-04 | 0.8266 | 2.262E-08 | 0.0000 | 0.000E+00 | 0.0000 | 1.095E-04 | 0.1599 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.252E-06 | 0.0135 |

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Intrinsic : SLDS Background Mean Accessible Soil Resident
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 0.000E+00 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Radon | | Plant | | Meat | | Milk | | All pathways | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|--------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 2.182E-06 | 0.0032 |
| Pa-231 | 0.000E+00 | 0.0000 | 1.139E-05 | 0.0166 |
| Ra-226 | 0.000E+00 | 0.0000 | 4.217E-04 | 0.6155 |
| Ra-228 | 0.000E+00 | 0.0000 | 5.848E-05 | 0.0854 |
| Th-228 | 0.000E+00 | 0.0000 | 1.273E-05 | 0.0186 |
| Th-230 | 0.000E+00 | 0.0000 | 2.457E-06 | 0.0036 |
| Th-232 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0900 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.725E-04 | 0.2517 |
| U-235 | 0.000E+00 | 0.0000 | 6.870E-07 | 0.0010 |
| U-238 | 0.000E+00 | 0.0000 | 3.081E-06 | 0.0045 |
| Total | 0.300E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0C00 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.852E-04 | 1.0000 |

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides
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 Intrinsic : SLDS Background Mean Accessible Soil Resident
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As pCi/yr at t= 1.000E+00 years

| Radio-Nuclide | Water Independent Pathways (Inhalation w/o radon) | | | | | Water Dependent Pathways | | | | | Total Ingestion* |
|---------------|---|-----------|-----------|-----------|-----------|--------------------------|-----------|-----------|-----------|-----------|------------------|
| | Inhalation | Plant | Meat | Milk | Soil | Water | Fish | Plant | Meat | Milk | |
| Ac-227 | 2.788E-04 | 9.862E+00 | 0.000E+00 | 0.000E+00 | 5.264E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.513E+01 |
| Pa-231 | 1.533E-03 | 2.130E+02 | 0.000E+00 | 0.000E+00 | 2.895E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.419E+02 |
| Pb-210 | 1.450E-04 | 2.227E+01 | 0.000E+00 | 0.000E+00 | 2.737E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.501E+01 |
| Ra-226 | 4.737E-03 | 2.632E+03 | 0.000E+00 | 0.000E+00 | 8.943E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.721E+03 |
| Ra-228 | 1.546E-03 | 9.103E+02 | 0.000E+00 | 0.000E+00 | 3.108E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 9.414E+02 |
| Th-228 | 1.873E-03 | 3.718E+01 | 0.000E+00 | 0.000E+00 | 3.537E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.254E+01 |
| Th-230 | 3.107E-03 | 4.597E+01 | 0.000E+00 | 0.000E+00 | 6.245E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.084E+02 |
| Th-232 | 1.858E-03 | 2.583E+01 | 0.000E+00 | 0.000E+00 | 3.509E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.091E+01 |
| U-234 | 7.003E-09 | 2.432E-04 | 0.000E+00 | 0.000E+00 | 1.322E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 3.754E-04 |
| U-235 | 1.363E-04 | 4.734E+00 | 0.000E+00 | 0.000E+00 | 2.573E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.307E+00 |
| U-238 | 2.470E-03 | 8.580E+01 | 0.000E+00 | 0.000E+00 | 4.664E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.324E+02 |

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
 and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.000E+00 years
Radionuclides

| Radon Pathway | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Water-ind. | 0.000E+00 |
| Water-dep. | 0.000E+00 |
| Total | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent
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Intrinsic : SLDS Background Mean Accessible Soil Resident
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

| Radio-Nuclide | Ground | | Inhalation | | Plant | | Meat | | Milk | | Soil | |
|---------------|-----------|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 9.333E-06 | 0.0136 | 4.437E-09 | 0.0000 | 4.858E-07 | 0.0007 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.663E-07 | 0.0007 |
| Pa-231 | 1.888E-06 | 0.0027 | 2.070E-09 | 0.0000 | 1.428E-06 | 0.0021 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.213E-07 | 0.0005 |
| Pb-210 | 6.618E-08 | 0.0001 | 7.223E-10 | 0.0000 | 2.509E-05 | 0.0365 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.614E-06 | 0.0038 |
| Ra-226 | 3.548E-04 | 0.5165 | 1.628E-09 | 0.0000 | 4.025E-05 | 0.0586 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.941E-06 | 0.0028 |
| Ra-228 | 7.257E-05 | 0.1056 | 2.817E-10 | 0.0000 | 4.270E-05 | 0.0622 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.325E-06 | 0.0034 |
| Th-228 | 1.247E-04 | 0.1815 | 7.696E-09 | 0.0000 | 4.708E-07 | 0.0007 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.239E-07 | 0.0012 |
| Th-230 | 2.460E-08 | 0.0000 | 2.827E-09 | 0.0000 | 1.641E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.784E-07 | 0.0006 |
| Th-232 | 5.802E-09 | 0.0000 | 2.414E-09 | 0.0000 | 1.031E-07 | 0.0001 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.431E-07 | 0.0004 |
| U-234 | 2.543E-13 | 0.0000 | 3.778E-14 | 0.0000 | 1.099E-11 | 0.0000 | 0.000E+00 | 0.C000 | 0.000E+00 | 0.0000 | 9.887E-12 | 0.0000 |
| U-235 | 6.600E-07 | 0.0010 | 4.086E-11 | 0.0000 | 1.372E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.248E-08 | 0.0000 |
| U-238 | 2.480E-06 | 0.0036 | 6.856E-10 | 0.0000 | 3.072E-07 | 0.0004 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.907E-07 | 0.0004 |
| Total | 5.666E-04 | 0.8247 | 2.280E-08 | 0.0000 | 1.110E-04 | 0.1616 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.415E-06 | 0.0137 |

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Plant | | Meat | | Milk | | All Pathways** | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|----------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 1.029E-05 | 0.0150 |
| Pa-231 | 0.000E+00 | 0.0000 | 3.640E-06 | 0.0053 |
| Pb-210 | 0.000E+00 | 0.0000 | 2.777E-05 | 0.0404 |

| | | | | | | | | | | | | |
|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| Ra-226 | 0.000E+00 | 0.0000 | 3.970E-04 | 0.5779 |
| Ra-228 | 0.000E+00 | 0.0000 | 1.176E-04 | 0.1712 |
| Th-228 | 0.000E+00 | 0.0000 | 1.260E-04 | 0.1834 |
| Th-230 | 0.000E+00 | 0.0000 | 5.699E-07 | 0.0008 |
| Th-232 | 0.000E+00 | 0.0000 | 3.544E-07 | 0.0005 |
| U-234 | 0.000E+00 | 0.0000 | 2.117E-11 | 0.0000 |
| U-235 | 0.000E+00 | 0.0000 | 6.862E-07 | 0.0010 |
| U-238 | 0.000E+00 | 0.0000 | 3.079E-06 | 0.0045 |
| Total | 0.000E+00 | 0.0000 | 6.870E-04 | 1.0000 |

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+00 years

| Radon Pathway | Radionuclides | | | | | | | |
|---------------|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
| Water-ind. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Water-dep. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Total | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existing Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years
Water Independent Pathways (Inhalation excludes radon)

| Radio-Nuclide | Ground | | Inhalation | | Radon | | Plant | | Meat | | Milk | | Soil | |
|---------------|-----------|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 1.914E-06 | 0.0028 | 9.101E-10 | 0.0000 | 0.000E+00 | 0.0000 | 9.893E-08 | 0.0001 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.564E-08 | 0.0001 |
| Pa-231 | 9.307E-06 | 0.0135 | 5.597E-09 | 0.0000 | 0.000E+00 | 0.0000 | 1.815E-06 | 0.0026 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.919E-07 | 0.0010 |
| Ra-226 | 3.532E-04 | 0.5141 | 2.340E-09 | 0.0000 | 0.000E+00 | 0.0000 | 6.506E-05 | 0.0947 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.536E-06 | 0.0066 |
| Ra-228 | 4.480E-05 | 0.0652 | 1.866E-09 | 0.0000 | 0.000E+00 | 0.0000 | 9.294E-06 | 0.0135 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.912E-07 | 0.0010 |
| Th-228 | 8.782E-06 | 0.0128 | 5.420E-10 | 0.0000 | 0.000E+00 | 0.0000 | 2.231E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 5.802E-08 | 0.0001 |
| Th-230 | 1.742E-06 | 0.0025 | 2.838E-09 | 0.0000 | 0.000E+00 | 0.0000 | 4.431E-07 | 0.0006 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.965E-07 | 0.0006 |
| Th-232 | 1.437E-04 | 0.2092 | 7.984E-09 | 0.0000 | 0.000E+00 | 0.0000 | 3.396E-05 | 0.0494 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.642E-06 | 0.0038 |
| U-235 | 6.602E-07 | 0.0010 | 4.100E-11 | 0.0000 | 0.000E+00 | 0.0000 | 1.377E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.249E-08 | 0.0000 |
| U-238 | 2.480E-06 | 0.0036 | 6.856E-10 | 0.0000 | 0.000E+00 | 0.0000 | 3.072E-07 | 0.0004 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.907E-07 | 0.0004 |
| Total | 5.666E-04 | 0.8247 | 2.280E-08 | 0.0000 | 0.000E+00 | 0.0000 | 1.110E-04 | 0.1616 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.415E-06 | 0.0137 |

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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Radon | | Plant | | Meat | | Milk | | All pathways | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|--------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 2.110E-06 | 0.0031 |
| Pa-231 | 0.000E+00 | 0.0000 | 1.182E-05 | 0.0172 |
| Ra-226 | 0.000E+00 | 0.0000 | 4.228E-04 | 0.6154 |
| Ra-228 | 0.000E+00 | 0.0000 | 5.479E-05 | 0.0797 |
| Th-228 | 0.000E+00 | 0.0000 | 8.863E-06 | 0.0129 |
| Th-230 | 0.000E+00 | 0.0000 | 2.584E-06 | 0.0038 |
| Th-232 | 0.000E+00 | 0.0000 | 1.803E-04 | 0.2624 |
| U-235 | 0.000E+00 | 0.0000 | 6.865E-07 | 0.0010 |
| U-238 | 0.000E+00 | 0.0000 | 3.079E-06 | 0.0045 |
| Total | 0.000E+00 | 0.0000 | 6.870E-04 | 1.0000 |

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides
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Inrisk : SLDS Background Mean Accessible Soil Resident
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 3.000E+00 years

| Radio-Nuclide | Water Independent Pathways (Inhalation w/o radon) | | | | | Water Dependent Pathways | | | | | Total Ingestion* |
|---------------|---|-----------|-----------|-----------|-----------|--------------------------|-----------|-----------|-----------|-----------|------------------|
| | Inhalation | Plant | Meat | Milk | Soil | Water | Fish | Plant | Meat | Milk | |
| Ac-227 | 3.550E-04 | 1.251E+01 | 0.000E+00 | 0.000E+00 | 6.703E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.921E+01 |
| Pa-231 | 1.531E-03 | 2.127E+02 | 0.000E+00 | 0.000E+03 | 2.891E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.416E+02 |
| Pb-210 | 4.213E-04 | 6.066E+01 | 0.000E+00 | 0.000E+00 | 7.955E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.861E+01 |
| Ra-226 | 4.730E-03 | 2.628E+03 | 0.000E+00 | 0.000E+00 | 8.931E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.718E+03 |
| Ra-228 | 1.690E-03 | 9.347E+02 | 0.000E+00 | 0.000E+00 | 3.191E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 9.666E+02 |
| Th-228 | 1.769E-03 | 3.603E+01 | 0.000E+00 | 0.000E+00 | 3.340E-01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.943E+01 |
| Th-230 | 3.307E-03 | 4.597E+01 | 0.000E+00 | 0.000E+00 | 6.244E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.084E+02 |
| Th-232 | 1.858E-03 | 2.583E+01 | 0.000E+00 | 0.000E+00 | 3.509E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.091E+01 |
| U-234 | 2.098E-08 | 7.287E-04 | 0.000E+00 | 0.000E+00 | 3.961E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.125E-03 |
| U-235 | 1.361E-04 | 4.727E+00 | 0.000E+00 | 0.000E+00 | 2.570E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.297E+00 |
| U-238 | 2.467E-03 | 8.568E+01 | 0.000E+00 | 0.000E+00 | 4.657E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.323E+02 |

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 3.000E+00 years

| Radon Pathway | Radionuclides | | | | | | | |
|---------------|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
| Water-ind. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Water-dep. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Total | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

| Radio-Nuclide | Water Independent Pathways (Inhalation excludes radon) | | | | | | | | | | | |
|---------------|--|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | Ground | | Inhalation | | Plant | | Meat | | Milk | | Soil | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 9.955E-06 | 0.0144 | 4.733E-09 | 0.0000 | 5.179E-07 | 0.0007 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.974E-07 | 0.0007 |
| Pa-231 | 1.886E-06 | 0.0027 | 2.067E-09 | 0.0000 | 1.426E-06 | 0.0021 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.208E-07 | 0.0005 |
| Pb-210 | 7.293E-08 | 0.0001 | 7.959E-10 | 0.0000 | 2.763E-05 | 0.0400 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.880E-06 | 0.0042 |
| Ra-226 | 3.544E-04 | 0.5129 | 1.626E-09 | 0.0000 | 4.020E-05 | 0.0582 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.938E-06 | 0.0028 |
| Ra-228 | 7.304E-05 | 0.1057 | 2.835E-10 | 0.0000 | 4.299E-05 | 0.0622 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.340E-06 | 0.0034 |
| Th-228 | 1.248E-04 | 0.1807 | 7.705E-09 | 0.0000 | 4.722E-07 | 0.0007 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.248E-07 | 0.0012 |
| Th-230 | 2.460E-08 | 0.0000 | 2.827E-09 | 0.0000 | 1.641E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.784E-07 | 0.0005 |
| Th-232 | 5.802E-09 | 0.0000 | 2.414E-09 | 0.0000 | 1.031E-07 | 0.0001 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.431E-07 | 0.0004 |
| U-234 | 2.858E-13 | 0.0000 | 4.246E-14 | 0.0000 | 1.236E-11 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.111E-11 | 0.0000 |
| U-235 | 6.591E-07 | 0.0010 | 4.080E-11 | 0.0000 | 1.370E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.246E-08 | 0.0000 |
| U-238 | 2.476E-06 | 0.0036 | 6.846E-10 | 0.0000 | 3.067E-07 | 0.0004 | 0.000E+00 | 0.0003 | 0.000E+00 | 0.0000 | 2.903E-07 | 0.0004 |
| Total | 5.674E-04 | 0.8212 | 2.318E-08 | 0.0000 | 1.138E-04 | 0.1647 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.725E-06 | 0.0141 |

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Plant | | Meat | | Milk | | All Pathways** | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|----------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 1.097E-05 | 0.0159 |
| Pa-231 | 0.000E+00 | 0.0000 | 3.635E-06 | 0.0053 |
| Pb-210 | 0.000E+00 | 0.0000 | 3.058E-05 | 0.0443 |
| Ra-226 | 0.000E+00 | 0.0000 | 3.965E-04 | 0.5739 |

| | | | | | | | | | | | | |
|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| Ra-228 | 0.000E+00 | 0.0000 | 1.184E-04 | 0.1713 |
| Th-228 | 0.000E+00 | 0.0000 | 1.262E-04 | 0.1826 |
| Th-230 | 0.000E+00 | 0.0000 | 5.699E-07 | 0.0008 |
| Th-232 | 0.000E+00 | 0.0000 | 3.544E-07 | 0.0005 |
| U-234 | 0.000E+00 | 0.0000 | 2.379E-11 | 0.0000 |
| U-235 | 0.000E+00 | 0.0000 | 6.853E-07 | 0.0010 |
| U-238 | 0.000E+00 | 0.0000 | 3.074E-06 | 0.0044 |
| Total | 0.000E+00 | 0.0000 | 6.909E-04 | 1.0000 |

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

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Intrinsic : SLDS Background Mean_Accessible Soil Resident

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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+00 years

| Radionuclides | | | | | | | | |
|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Radon Pathway | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
| Water-ind. | 0.000E+00 |
| Water-dep. | 0.000E+00 |
| Total | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years
Water Independent Pathways (Inhalation excludes radon)

| Radio-Nuclide | Ground | | Inhalation | | Radon | | Plant | | Meat | | Milk | | Soil | |
|---------------|-----------|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 1.790E-06 | 0.0026 | 8.509E-10 | 0.0000 | 0.000E+00 | 0.0000 | 9.250E-08 | 0.0001 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.942E-08 | 0.0001 |
| Pa-231 | 1.005E-05 | 0.0145 | 5.949E-09 | 0.0000 | 0.000E+00 | 0.0000 | 1.851E-06 | 0.0027 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.287E-07 | 0.0011 |
| Ra-226 | 3.525E-04 | 0.5102 | 2.410E-09 | 0.0000 | 0.000E+00 | 0.0000 | 6.751E-05 | 0.0977 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.797E-06 | 0.0069 |
| Ra-228 | 3.841E-05 | 0.0556 | 1.665E-09 | 0.0000 | 0.000E+00 | 0.0000 | 7.304E-06 | 0.0106 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 5.640E-07 | 0.0008 |
| Th-228 | 4.255E-06 | 0.0062 | 2.626E-10 | 0.0000 | 0.000E+00 | 0.0000 | 1.081E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.811E-08 | 0.0000 |
| Th-230 | 1.955E-06 | 0.0028 | 2.839E-09 | 0.0000 | 0.000E+00 | 0.0000 | 4.832E-07 | 0.0007 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.994E-07 | 0.0006 |
| Th-232 | 1.552E-04 | 0.2247 | 8.475E-09 | 0.0000 | 0.000E+00 | 0.0000 | 3.625E-05 | 0.0525 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.816E-06 | 0.0041 |
| U-235 | 6.593E-07 | 0.0010 | 4.096E-11 | 0.0000 | 0.000E+00 | 0.0000 | 1.376E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.248E-08 | 0.0000 |
| U-238 | 2.476E-06 | 0.0036 | 6.847E-10 | 0.0000 | 0.000E+00 | 0.0000 | 3.067E-07 | 0.0004 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.903E-07 | 0.0004 |
| Total | 5.674E-04 | 0.8212 | 2.318E-08 | 0.0000 | 0.000E+00 | 0.0000 | 1.138E-04 | 0.1647 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.725E-06 | 0.0141 |

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Intrinsic : SLDS Background Mean_Accessible Soil Resident

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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t = 3.000E+00 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Radon | | Plant | | Meat | | Milk | | All pathways | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|--------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 1.972E-06 | 0.0029 |
| Pa-231 | 0.000E+00 | 0.0000 | 1.264E-05 | 0.0183 |
| Ra-226 | 0.000E+00 | 0.0000 | 4.248E-04 | 0.6149 |
| Ra-228 | 0.000E+00 | 0.0000 | 4.628E-05 | 0.0670 |
| Th-228 | 0.000E+00 | 0.0000 | 4.294E-06 | 0.0062 |
| Th-230 | 0.000E+00 | 0.0000 | 2.841E-06 | 0.0041 |
| Th-232 | 0.000E+00 | 0.0000 | 1.943E-04 | 0.2812 |
| U-235 | 0.000E+00 | 0.0000 | 6.856E-07 | 0.0010 |
| U-238 | 0.000E+00 | 0.0000 | 3.074E-06 | 0.0044 |
| Total | 0.000E+00 | 0.0000 | 6.909E-04 | 1.0000 |

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides
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Inrisk : SLDS Background Mear_Accessible Soil Resident
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t = 1.000E+01 years

| Radio-Nuclide | Water Independent Pathways (Inhalation w/o radon) | | | | | Water Dependent Pathways | | | | | Total Ingestion* | |
|---------------|---|-----------|-----------|-----------|-----------|--------------------------|-----------|-----------|-----------|-----------|------------------|--|
| | Inhalation | Plant | Meat | Milk | Soil | Water | Fish | Plant | Meat | Milk | | |
| Ac-227 | 5.838E-04 | 2.045E+01 | 0.000E+00 | 0.000E+00 | 1.102E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 3.148E+01 | |
| Pa-231 | 1.523E-03 | 2.116E+02 | 0.000E+00 | 0.000E+00 | 2.876E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.403E+02 | |
| Pb-210 | 1.260E-03 | 1.771E+02 | 0.000E+00 | 0.000E+00 | 2.379E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.009E+02 | |
| Ra-226 | 4.709E-03 | 2.616E+03 | 0.000E+00 | 0.000E+00 | 8.891E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.705E+03 | |
| Ra-228 | 1.782E-03 | 9.857E+02 | 0.000E+00 | 0.000E+00 | 3.364E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.019E+03 | |
| Th-228 | 1.760E-03 | 3.652E+01 | 0.000E+00 | 0.000E+00 | 3.323E+01 | 0.000E+00 | 0.300E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.975E+01 | |
| Th-230 | 3.107E-03 | 4.596E+01 | 0.000E+00 | 0.000E+00 | 6.244E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.084E+02 | |
| Th-232 | 1.858E-03 | 2.583E+01 | 0.000E+00 | 0.000E+00 | 3.509E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.091E+01 | |
| U-234 | 6.958E-08 | 2.417E-03 | 0.000E+00 | 0.000E+00 | 1.314E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 3.730E-03 | |
| U-235 | 1.354E-04 | 4.704E+00 | 0.000E+00 | 0.000E+00 | 2.557E+00 | 0.000E+00 | 0.500E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.260E+00 | |
| U-238 | 2.454E-03 | 8.525E+01 | 0.000E+00 | 0.000E+00 | 4.634E+01 | 0.000E+00 | 0.500E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.316E+02 | |

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of

| Radon and its Decay Products as pCi/yr at t= 1.000E+01 years | | | | | | | | |
|--|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Radon Pathway | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
| Water-ind. | 0.000E+00 |
| Water-dep. | 0.000E+00 |
| Total | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent
 1RESRAD, Version 6.5 T½ Limit = 180 days 12/04/2013 15:14 Page 18
 Intrisk : SLDS Background Mean_Accessible Soil Resident
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| Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p) and Fraction of Total Risk at t= 1.000E+01 years | | | | | | | | | | | | |
|---|-----------|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| Water Independent Pathways (Inhalation excludes radon) | | | | | | | | | | | | |
| Radio-Nuclide | Ground | | Inhalation | | Plant | | Meat | | Milk | | Soil | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 1.182E-05 | 0.0168 | 5.618E-09 | 0.0000 | 6.141E-07 | 0.0009 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 5.904E-07 | 0.0008 |
| Pa-231 | 1.876E-06 | 0.0027 | 2.056E-09 | 0.0000 | 1.419E-06 | 0.0020 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.191E-07 | 0.0005 |
| Pb-210 | 9.337E-08 | 0.0001 | 1.019E-09 | 0.0000 | 3.531E-05 | 0.0502 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.687E-06 | 0.0052 |
| Ra-226 | 3.528E-04 | 0.5019 | 1.618E-09 | 0.0000 | 4.002E-05 | 0.0569 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.929E-06 | 0.0027 |
| Ra-228 | 7.404E-05 | 0.1053 | 2.874E-10 | 0.0000 | 4.357E-05 | 0.0620 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.372E-06 | 0.0034 |
| Th-228 | 1.265E-04 | 0.1799 | 7.805E-09 | 0.0000 | 4.785E-07 | 0.0007 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.355E-07 | 0.0012 |
| Th-230 | 2.460E-08 | 0.0000 | 2.827E-09 | 0.0000 | 1.641E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.783E-07 | 0.0005 |
| Th-232 | 5.802E-09 | 0.0000 | 2.414E-09 | 0.0000 | 1.031E-C7 | 0.0001 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.431E-07 | 0.0003 |
| U-234 | 3.953E-13 | 0.0000 | 5.873E-14 | 0.0000 | 1.709E-11 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.537E-11 | 0.0000 |
| U-235 | 6.558E-07 | 0.0009 | 4.060E-11 | 0.0000 | 1.363E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.240E-08 | 0.0000 |
| U-238 | 2.464E-06 | 0.0035 | 6.812E-10 | 0.0000 | 3.052E-07 | 0.0004 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.889E-07 | 0.0004 |
| Total | 5.703E-04 | 0.8112 | 2.437E-08 | 0.0000 | 1.220E-04 | 0.1736 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.066E-05 | 0.0152 |

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

| Water Dependent Pathways | | | | | | | | | | | | |
|--------------------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|----------------|--------|
| Radio-Nuclide | Water | | Fish | | Plant | | Meat | | Milk | | All Pathways** | |
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 1.303E-05 | 0.0185 |
| Pa-231 | 0.000E+00 | 0.0000 | 3.616E-06 | 0.0051 |
| Pb-210 | 0.000E+00 | 0.0000 | 3.909E-05 | 0.0556 |
| Ra-226 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0003 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.948E-04 | 0.5616 |
| Ra-228 | 0.000E+00 | 0.0000 | 1.200E-04 | 0.1707 |

| | | | | | | | | | | | | |
|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| Th-228 | 0.000E+00 | 0.0000 | 0.000E-00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.278E-04 | 0.1818 |
| Th-230 | 0.000E+00 | 0.0000 | 5.698E-07 | 0.0008 |
| Th-232 | 0.000E+00 | 0.0000 | 3.544E-07 | 0.0005 |
| U-234 | 0.000E+00 | 0.0000 | 3.291E-11 | 0.0000 |
| U-235 | 0.000E+00 | 0.0000 | 6.818E-07 | 0.0010 |
| U-238 | 0.000E+00 | 0.0000 | 3.059E-06 | 0.0044 |
| Total | 0.000E+00 | 0.0000 | 7.029E-04 | 1.0000 |

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

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Intrisk : SLDS Background Mean_Accessible Soil Resident
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| Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of Radon and its Decay Products at t= 1.000E+01 years | | | | | | | | |
|---|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Radionuclides | | | | | | | | |
| Radon Pathway | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
| Water-ind. | 0.000E+00 |
| Water-dep. | 0.000E+00 |
| Total | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

| Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p) and Fraction of Total Risk at t= 1.000E+01 years | | | | | | | | | | | | | | |
|---|-----------|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| Water Independent Pathways (Inhalation excludes radon) | | | | | | | | | | | | | | |
| Radio-Nuclide | Ground | | Inhalation | | Radon | | Plant | | Meat | | Milk | | Soil | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 1.415E-06 | 0.0020 | 6.725E-10 | 0.0000 | 0.000E+00 | 0.0000 | 7.311E-08 | 0.0001 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.068E-08 | 0.0001 |
| Pa-231 | 1.228E-05 | 0.0175 | 7.002E-09 | 0.0000 | 0.000E+00 | 0.0000 | 1.960E-06 | 0.0028 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.388E-07 | 0.0012 |
| Ra-226 | 3.502E-04 | 0.4982 | 2.620E-09 | 0.0000 | 0.000E+00 | 0.0000 | 7.486E-05 | 0.1065 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 5.585E-06 | 0.0079 |
| Ra-228 | 1.829E-05 | 0.0260 | 8.263E-10 | 0.0000 | 0.000E+00 | 0.0000 | 3.135E-06 | 0.0045 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.538E-07 | 0.0004 |
| Tr-228 | 3.368E-07 | 0.0005 | 2.079E-11 | 0.0000 | 0.000E+00 | 0.0000 | 8.556E-10 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.225E-09 | 0.0000 |
| Th-230 | 2.699E-06 | 0.0038 | 2.844E-09 | 0.0000 | 0.000E+00 | 0.0000 | 6.341E-07 | 0.0009 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.103E-07 | 0.0006 |
| Th-232 | 1.819E-04 | 0.2588 | 9.659E-09 | 0.0000 | 0.000E+00 | 0.0000 | 4.102E-05 | 0.0584 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.194E-06 | 0.0045 |
| U-235 | 6.562E-07 | 0.0009 | 4.084E-11 | 0.0000 | 0.000E+00 | 0.0000 | 1.371E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.243E-08 | 0.0000 |
| U-238 | 2.464E-06 | 0.0035 | 6.813E-10 | 0.0000 | 0.000E+00 | 0.0000 | 3.052E-07 | 0.0004 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.889E-07 | 0.0004 |
| Total | 5.703E-04 | 0.8112 | 2.437E-08 | 0.0000 | 0.000E+00 | 0.0000 | 1.220E-04 | 0.1736 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.066E-05 | 0.0152 |

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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existert Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Radon | | Plant | | Meat | | Milk | | All pathways | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|--------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 1.559E-06 | 0.0022 |
| Pa-231 | 0.000E+00 | 0.0000 | 1.508E-05 | 0.0215 |
| Ra-226 | 0.000E+00 | 0.0000 | 4.307E-04 | 0.6127 |
| Ra-228 | 0.000E+00 | 0.0000 | 2.168E-05 | 0.0308 |
| Th-228 | 0.000E+00 | 0.0000 | 3.399E-07 | 0.0005 |
| Th-230 | 0.000E+00 | 0.0000 | 3.746E-06 | 0.0053 |
| Th-232 | 0.000E+00 | 0.0000 | 2.261E-04 | 0.3217 |
| U-235 | 0.000E+00 | 0.0000 | 6.823E-07 | 0.0010 |
| U-238 | 0.000E+00 | 0.0000 | 3.059E-06 | 0.0044 |
| Total | 0.000E+00 | 0.0000 | 7.029E-04 | 1.0000 |

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides
1RESRAD, Version 6.5 T½ Limit = 180 days 12/04/2013 15:14 Page 21
Inrisk : SLDS Background Mean Accessible Soil Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\BKGD MEAN ACC RESIDENT.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 7.000E+01 years

| Radio-Nuclide | Water Independent Pathways (Inhalation w/o radon) | | | | | Water Dependent Pathways | | | | | Total Ingestion* |
|---------------|---|-----------|-----------|-----------|-----------|--------------------------|-----------|-----------|-----------|-----------|------------------|
| | Inhalation | Plant | Meat | Milk | Soil | Water | Fish | Plant | Meat | Milk | |
| Ac-227 | 1.293E-03 | 4.508E+01 | 0.000E+00 | 0.000E+00 | 2.441E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.949E+01 |
| Pa-231 | 1.458E-03 | 2.025E+02 | 0.000E+00 | 0.000E+00 | 2.752E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.300E+02 |
| Pb-210 | 4.044E-03 | 5.638E+02 | 0.000E+00 | 0.000E+00 | 7.636E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.402E+02 |
| Ra-226 | 4.533E-03 | 2.519E+03 | 0.000E+00 | 0.000E+00 | 8.559E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.604E+03 |
| Ra-228 | 1.850E-03 | 1.024E+03 | 0.000E+00 | 0.000E+00 | 3.494E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.059E+03 |
| Th-228 | 1.850E-03 | 3.825E+01 | 0.000E+00 | 0.000E+00 | 3.493E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.318E+01 |
| Th-230 | 3.305E-03 | 4.594E+01 | 0.000E+00 | 0.000E+00 | 6.240E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.083E+02 |
| Th-232 | 1.858E-03 | 2.583E+01 | 0.000E+00 | 0.000E+00 | 3.508E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.091E+01 |
| U-234 | 4.666E-07 | 1.621E-02 | 0.000E+00 | 0.000E+00 | 8.809E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.501E-02 |
| U-235 | 1.297E-04 | 4.506E+00 | 0.000E+00 | 0.000E+00 | 2.449E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.956E+00 |
| U-238 | 2.351E-03 | 8.167E+01 | 0.000E+00 | 0.000E+00 | 4.440E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.261E+02 |

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 7.000E+01 years

0

Radionuclides

| Radon Pathway | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Water-ind. | 0.000E+00 |
| Water-dep. | 0.000E+00 |
| Total | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

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Inrisk : SLDS Background Mean_Accessible Soil Resident

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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 7.000E+01 years

| Radio-Nuclide | Water Independent Pathways (Inhalation excludes radon) | | | | | | | | | | | |
|---------------|--|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | Ground | | Inhalation | | Plant | | Meat | | Milk | | Soil | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 1.740E-05 | 0.0240 | 8.271E-09 | 0.0000 | 9.023E-07 | 0.0012 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.692E-07 | 0.0012 |
| Pa-231 | 1.795E-06 | 0.0025 | 1.968E-09 | 0.0000 | 1.358E-06 | 0.0019 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.054E-07 | 0.0004 |
| Pb-210 | 1.599E-07 | 0.0002 | 1.745E-09 | 0.0000 | 6.030E-05 | 0.0832 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.313E-06 | 0.0087 |
| Ra-226 | 3.397E-04 | 0.4687 | 1.558E-09 | 0.0000 | 3.853E-05 | 0.0532 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.858E-06 | 0.0026 |
| Ra-228 | 7.478E-05 | 0.1032 | 2.903E-10 | 0.0000 | 4.401E-05 | 0.0607 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.395E-06 | 0.0033 |
| Th-228 | 1.283E-04 | 0.1770 | 7.918E-09 | 0.0000 | 4.847E-07 | 0.0007 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.477E-07 | 0.0012 |
| Th-230 | 2.458E-08 | 0.0000 | 2.826E-09 | 0.0000 | 1.640E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.781E-07 | 0.0005 |
| Th-232 | 5.802E-09 | 0.0000 | 2.414E-09 | 0.0000 | 1.030E-07 | 0.0001 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.431E-07 | 0.0003 |
| U-234 | 1.230E-12 | 0.0000 | 1.916E-13 | 0.0000 | 5.574E-11 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 5.013E-11 | 0.0000 |
| U-235 | 6.282E-07 | 0.0009 | 3.890E-11 | 0.0000 | 1.306E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.188E-08 | 0.0000 |
| U-238 | 2.361E-06 | 0.0033 | 6.526E-10 | 0.0000 | 2.924E-07 | 0.0004 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.767E-07 | 0.0004 |
| Total | 5.651E-04 | 0.7797 | 2.768E-08 | 0.0000 | 1.462E-04 | 0.2016 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.350E-05 | 0.0186 |

0

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 7.000E+01 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Plant | | Meat | | Milk | | All Pathways** | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|----------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 1.918E-05 | 0.0265 |
| Pa-231 | 0.000E+00 | 0.0000 | 3.460E-06 | 0.0048 |
| Pb-210 | 0.000E+00 | 0.0000 | 6.677E-05 | 0.0921 |
| Ra-226 | 0.000E+00 | 0.0000 | 3.801E-04 | 0.5244 |
| Ra-228 | 0.000E+00 | 0.0000 | 1.212E-04 | 0.1672 |
| Th-228 | 0.000E+00 | 0.0000 | 1.296E-04 | 0.1789 |

| | | | | | | | | | | | | |
|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| Th-230 | 0.000E+00 | 0.0000 | 5.695E-07 | 0.0008 |
| Th-232 | 0.000E+00 | 0.0000 | 3.544E-07 | 0.0005 |
| U-234 | 0.000E+00 | 0.0000 | 1.074E-10 | 0.0000 |
| U-235 | 0.000E+00 | 0.0000 | 6.532E-07 | 0.0009 |
| U-238 | 0.000E+00 | 0.0000 | 2.930E-06 | 0.0040 |
| Total | 0.000E+00 | 0.0000 | 7.248E-04 | 1.0000 |

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

1RESRAD, Version 6.5 T_{1/2} Limit = 180 days 12/04/2013 15:14 Page 23

Intrinsic : SLDS Background Mean Accessible Soil Resident

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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 7.000E+01 years

| Radionuclides | | | | | | | | |
|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Radon Pathway | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
| Water-ind. | 0.000E+00 |
| Water-dep. | 0.000E+00 |
| Total | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

0
0
0
Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 7.000E+01 years

| Water Independent Pathways (Inhalation excludes radon) | | | | | | | | | | | | | | |
|--|-----------|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| Radio-Nuclide | Ground | | Inhalation | | Radon | | Plant | | Meat | | Milk | | Soil | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 1.883E-07 | 0.0003 | 8.954E-11 | 0.0000 | 0.000E+00 | 0.0000 | 9.733E-09 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.410E-09 | 0.0000 |
| Pa-231 | 1.900E-05 | 0.0262 | 1.015E-08 | 0.0000 | 0.000E+00 | 0.0000 | 2.250E-06 | 0.0031 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.165E-06 | 0.0016 |
| Ra-226 | 3.310E-04 | 0.4567 | 3.231E-09 | 0.0000 | 0.000E+00 | 0.0000 | 9.673E-05 | 0.1335 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.008E-06 | 0.0110 |
| Ra-228 | 1.310E-08 | 0.0000 | 5.968E-13 | 0.0000 | 0.000E+00 | 0.0000 | 2.197E-09 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.797E-10 | 0.0000 |
| Th-228 | 1.220E-16 | 0.0000 | 7.528E-21 | 0.0000 | 0.000E+00 | 0.0000 | 3.098E-19 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.059E-19 | 0.0000 |
| Th-230 | 8.872E-06 | 0.0122 | 2.898E-09 | 0.0000 | 0.000E+00 | 0.0000 | 2.264E-06 | 0.0031 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 5.412E-07 | 0.0007 |
| Th-232 | 2.031E-04 | 0.2802 | 1.062E-08 | 0.0000 | 0.000E+00 | 0.0000 | 4.460E-05 | 0.0615 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.486E-06 | 0.0048 |
| U-235 | 6.305E-07 | 0.0009 | 4.014E-11 | 0.0000 | 0.000E+00 | 0.0000 | 1.338E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.202E-08 | 0.0000 |
| U-238 | 2.361E-06 | 0.0033 | 6.528E-10 | 0.0000 | 0.000E+00 | 0.0000 | 2.924E-07 | 0.0004 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.768E-07 | 0.0004 |
| Total | 5.651E-04 | 0.7797 | 2.768E-08 | 0.0000 | 0.000E+00 | 0.0000 | 1.462E-04 | 0.2016 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.350E-05 | 0.0186 |

1RESRAD, Version 6.5 T_{1/2} Limit = 180 days 12/04/2013 15:14 Page 24

Intrinsic : SLDS Background Mean Accessible Soil Resident

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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)

and Fraction of Total Risk at t = 7.000E+01 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Radon | | Plant | | Meat | | Milk | | All pathways | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|--------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 2.076E-07 | 0.0003 |
| Pa-231 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+C0 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.243E-05 | 0.0309 |
| Ra-226 | 0.000E+00 | 0.0000 | 4.357E-04 | 0.6012 |
| Ra-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.C000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.548E-08 | 0.0000 |
| Th-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.C000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.231E-16 | 0.0000 |
| Th-230 | 0.000E+00 | 0.0000 | 0.000E+C0 | 0.000C | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.168E-05 | 0.0161 |
| Th-232 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0300 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.512E-04 | 0.3465 |
| U-235 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0300 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.559E-07 | 0.0009 |
| U-238 | 0.000E+00 | 0.0000 | 2.931E-06 | 0.0040 |
| Total | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0C00 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.248E-04 | 1.0000 |

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides
RESRAD, Version 6.5 $T_{\frac{1}{2}}$ Limit = 180 days 12/04/2013 15:14 Page 25
Inrisk : SLDS Background Mear_Accessible Soil Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\BKGD MEAN ACC RESIDENT.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t = 1.000E+02 years

| Radio-Nuclide | Water Independent Pathways (Inhalation w/o radon) | | | | | Water Dependent Pathways | | | | | Total Ingestion* |
|---------------|---|-----------|-----------|-----------|-----------|--------------------------|-----------|-----------|-----------|-----------|------------------|
| | Inhalation | Plant | Meat | Milk | Soil | Water | Fish | Plant | Meat | Milk | |
| Ac-227 | 1.337E-03 | 4.662E+01 | 0.000E+00 | 0.000E+00 | 2.525E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.187E+01 |
| Pa-231 | 1.426E-03 | 1.981E+02 | 0.000E+00 | 0.000E+00 | 2.692E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.250E+02 |
| Pb-210 | 4.282E-03 | 5.968E+02 | 0.000E+00 | 0.000E+00 | 8.084E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.776E+02 |
| Ra-226 | 4.449E-03 | 2.472E+03 | 0.000E+00 | 0.000E+00 | 8.400E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.556E+03 |
| Ra-228 | 1.850E-03 | 1.024E+03 | 0.000E+00 | 0.000E+00 | 3.494E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.059E+03 |
| Th-228 | 1.850E-03 | 3.825E+01 | 0.000E+00 | 0.000E+00 | 3.494E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.318E+01 |
| Th-230 | 3.304E-03 | 4.592E+01 | 0.000E+00 | 0.000E+00 | 6.239E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.083E+02 |
| Th-232 | 1.858E-03 | 2.583E+01 | 0.000E+00 | 0.000E+00 | 3.508E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.091E+01 |
| U-234 | 6.524E-07 | 2.266E-02 | 0.000E+00 | 0.000E+00 | 1.232E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 3.498E-02 |
| U-235 | 1.270E-04 | 4.411E+00 | 0.000E+00 | 0.000E+00 | 2.397E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.808E+00 |
| U-238 | 2.302E-03 | 7.994E+01 | 0.000E+00 | 0.000E+00 | 4.345E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.234E+02 |

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0 Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t = 1.000E+02 years
0 Radionuclides

| Radon Pathway | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Water-ind. | 0.000E+00 |
| Water-dep. | 0.000E+00 |
| Total | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent
 1RESRAD, Version 6.5 T½ Limit = 180 days 12/04/2013 15:14 Page 26
 Intrisk : SLDS Background Mean Accessible Soil Resident
 File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\BKGD MEAN ACC RESIDENT.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+02 years

| Radio-Nuclide | Water Independent Pathways (Inhalation excludes radon) | | | | | | | | | | | |
|---------------|--|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | Ground | | Inhalation | | Plant | | Meat | | Milk | | Soil | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 1.762E-05 | 0.0245 | 8.378E-09 | 0.0000 | 9.139E-07 | 0.0013 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.804E-07 | 0.0012 |
| Pa-231 | 1.756E-06 | 0.0024 | 1.925E-09 | 0.0000 | 1.328E-06 | 0.0018 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.987E-07 | 0.0004 |
| Pb-210 | 1.646E-07 | 0.0002 | 1.797E-09 | 0.0000 | 6.208E-05 | 0.0862 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.501E-06 | 0.0090 |
| Ra-226 | 3.334E-04 | 0.4632 | 1.529E-09 | 0.0000 | 3.782E-05 | 0.0525 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.823E-06 | 0.0025 |
| Ra-228 | 7.478E-05 | 0.1039 | 2.903E-10 | 0.0000 | 4.401E-05 | 0.0611 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.395E-06 | 0.0033 |
| Th-228 | 1.283E-04 | 0.1782 | 7.918E-09 | 0.0000 | 4.847E-07 | 0.0007 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.476E-07 | 0.0012 |
| Th-230 | 2.458E-08 | 0.0000 | 2.825E-09 | 0.0000 | 1.639E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.780E-07 | 0.0005 |
| Th-232 | 5.802E-09 | 0.0000 | 2.414E-09 | 0.0000 | 1.030E-07 | 0.0001 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.431E-07 | 0.0003 |
| U-234 | 1.708E-12 | 0.0000 | 2.537E-13 | 0.0000 | 7.382E-11 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.639E-11 | 0.0000 |
| U-235 | 6.149E-07 | 0.0009 | 3.807E-11 | 0.0000 | 1.278E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.162E-08 | 0.0000 |
| U-238 | 2.311E-06 | 0.0032 | 6.388E-10 | 0.0000 | 2.862E-07 | 0.0004 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.709E-07 | 0.0004 |
| Total | 5.590E-04 | 0.7765 | 2.775E-08 | 0.0000 | 1.472E-04 | 0.2045 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.365E-05 | 0.0190 |

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+02 years

Water Dependent Pathways

| Radio-Nuclide | Water Dependent Pathways | | | | | | | | | | | |
|---------------|--------------------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|----------------|--------|
| | Water | | Fish | | Plant | | Meat | | Milk | | All Pathways** | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.942E-05 | 0.0270 |
| Pa-231 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.385E-06 | 0.0047 |
| Pb-210 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.875E-05 | 0.0955 |
| Ra-226 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.731E-04 | 0.5182 |
| Ra-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.212E-04 | 0.1683 |
| Th-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.296E-04 | 0.1801 |
| Th-230 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 5.693E-07 | 0.0008 |

| | | | | | | | | | | | | |
|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| Th-232 | 0.000E+00 | 0.0000 | 3.544E-07 | 0.0005 |
| U-234 | 0.000E+00 | 0.0000 | 1.422E-10 | 0.0000 |
| U-235 | 0.000E+00 | 0.0000 | 6.394E-07 | 0.0009 |
| U-238 | 0.000E+00 | 0.0000 | 0.000E-00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.868E-06 | 0.0040 |
| Total | 0.000E+00 | 0.0000 | 7.199E-04 | 1.0000 |

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways
1RESRAD, Version 6.5 T½ Limit = 180 days 12/04/2013 15:14 Page 27
Inrisk : SLDS Background Mean_Accessible Soil Resident
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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+02 years
Radionuclides

| 0 | Radon Pathway | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
|------------|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Water-ind. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Water-dep. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| Total | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

0 Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

| 0 | Water Independent Pathways (Inhalation excludes radon) | | | | | | | | | | | | | |
|---------------|--|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| 0 | Ground | | Inhalation | | Radon | | Plant | | Meat | | Milk | | Soil | |
| Radio-Nuclide | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 6.871E-08 | 0.0001 | 3.267E-11 | 0.0000 | 0.000E+00 | 0.0000 | 3.551E-09 | 0.000C | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.433E-09 | 0.0000 |
| Pa-231 | 1.931E-05 | 0.0268 | 1.027E-08 | 0.0000 | 0.000E+00 | 0.0000 | 2.238E-06 | 0.0031 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.176E-06 | 0.0016 |
| Ra-226 | 3.218E-04 | 0.4470 | 3.224E-09 | 0.0000 | 0.000E+00 | 0.0000 | 9.692E-05 | 0.1346 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.088E-06 | 0.0112 |
| Ra-228 | 3.469E-10 | 0.0000 | 1.580E-14 | 0.0000 | 0.000E+00 | 0.0000 | 5.815E-11 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.757E-12 | 0.0000 |
| Tl-228 | 2.321E-21 | 0.0000 | 1.433E-25 | 0.0000 | 0.000E+00 | 0.0000 | 5.896E-24 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.534E-23 | 0.0000 |
| Th-230 | 1.183E-05 | 0.0164 | 2.926E-09 | 0.0000 | 0.000E+00 | 0.0000 | 3.143E-06 | 0.0044 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.142E-07 | 0.0009 |
| Th-232 | 2.031E-04 | 0.2821 | 1.062E-08 | 0.0000 | 0.000E+00 | 0.0000 | 4.460E-05 | 0.0620 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.486E-06 | 0.0048 |
| U-235 | 6.182E-07 | 0.0009 | 3.986E-11 | 0.0000 | 0.000E+00 | 0.0000 | 1.322E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.183E-08 | 0.0000 |
| U-238 | 2.311E-06 | 0.0032 | 6.390E-10 | 0.0000 | 0.000E+00 | 0.0000 | 2.862E-07 | 0.0004 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.709E-07 | 0.0004 |
| Total | 5.590E-04 | 0.7765 | 2.775E-08 | 0.0000 | 0.000E+00 | 0.0000 | 1.472E-04 | 0.2045 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.365E-05 | 0.0190 |

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Inrisk : SLDS Background Mean_Accessible Soil Resident
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Radon | | Plant | | Meat | | Milk | | All pathways | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|--------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 7.573E-08 | 0.0001 |
| Pa-231 | 0.000E+00 | 0.0000 | 2.273E-05 | 0.0316 |
| Ra-226 | 0.000E+00 | 0.0000 | 4.268E-04 | 0.5929 |
| Ra-228 | 0.000E+00 | 0.0000 | 4.098E-10 | 0.0000 |
| Th-228 | 0.000E+00 | 0.0000 | 2.343E-21 | 0.0000 |
| Th-230 | 0.000E+00 | 0.0000 | 1.559E-05 | 0.0217 |
| Th-232 | 0.000E+00 | 0.0000 | 2.512E-04 | 0.3489 |
| U-235 | 0.000E+00 | 0.0000 | 6.433E-07 | 0.0009 |
| U-238 | 0.000E+00 | 0.0000 | 2.868E-06 | 0.0040 |
| Total | 0.000E+00 | 0.0000 | 7.199E-04 | 1.0000 |

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides
 1RESRAD, Version 6.5 $T_{1/2}$ Limit = 180 days 12/04/2013 15:14 Page 29
 Intrisk : SLDS Background Mean Accessible Soil Resident
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As pCi/yr at t= 3.000E+02 years

| Radio-Nuclide | Water Independent Pathways (Inhalation w/o radon) | | | | | Water Dependent Pathways | | | | | Total Ingestion* |
|---------------|---|-----------|-----------|-----------|-----------|--------------------------|-----------|-----------|-----------|-----------|------------------|
| | Inhalation | Plant | Meat | Milk | Soil | Water | Fish | Plant | Meat | Milk | |
| Ac-227 | 1.192E-03 | 4.155E+01 | 0.000E+00 | 0.000E+00 | 2.251E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.406E+01 |
| Pa-231 | 1.231E-03 | 1.710E+02 | 0.000E+00 | 0.000E+00 | 2.324E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.943E+02 |
| Pb-210 | 3.973E-03 | 5.536E+02 | 0.000E+00 | 0.000E+00 | 7.501E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.286E+02 |
| Ra-226 | 3.944E-03 | 2.191E+03 | 0.000E+00 | 0.000E+00 | 7.446E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 2.266E+03 |
| Ra-228 | 1.850E-03 | 1.024E+03 | 0.000E+00 | 0.000E+00 | 3.493E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.059E+03 |
| Th-228 | 1.850E-03 | 3.824E+01 | 0.000E+00 | 0.000E+00 | 3.493E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.318E+01 |
| Th-230 | 3.298E-03 | 4.584E+01 | 0.000E+00 | 0.000E+00 | 6.227E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.081E+02 |
| Th-232 | 1.858E-03 | 2.582E+01 | 0.000E+00 | 0.000E+00 | 3.508E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.090E+01 |
| U-234 | 1.696E-06 | 5.891E-02 | 0.000E+00 | 0.000E+00 | 3.202E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 9.092E-02 |
| U-235 | 1.101E-04 | 3.823E+00 | 0.000E+00 | 0.000E+00 | 2.078E-00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 5.901E+00 |
| U-238 | 1.995E-03 | 6.929E+01 | 0.000E+00 | 0.000E+00 | 3.767E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.070E+02 |

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
 and water-dependent water, fish, plant, meat, milk pathways

0
 Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
 Radon and its Decay Products as pCi/yr at t= 3.000E+02 years
 0
 Radon

| Pathway | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Water-ind. | 0.000E+00 |
| Water-dep. | 0.000E+00 |
| Total | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

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Intrinsic : SLDS Background Mean Accessible Soil Resident

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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

| Radio-Nuclide | Water Independent Pathways (Inhalation excludes radon) | | | | | | | | | | | |
|---------------|--|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | Ground | | Inhalation | | Plant | | Meat | | Milk | | Soil | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 1.552E-05 | 0.0232 | 7.331E-09 | 0.0000 | 8.051E-07 | 0.0012 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.757E-07 | 0.0012 |
| Pa-231 | 1.516E-06 | 0.0023 | 1.662E-09 | 0.0000 | 1.147E-06 | 0.0017 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.580E-07 | 0.0004 |
| Pb-210 | 1.503E-07 | 0.0002 | 1.641E-09 | 0.0000 | 5.669E-05 | 0.0848 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 5.937E-06 | 0.0089 |
| Ra-226 | 2.957E-04 | 0.4424 | 1.356E-09 | 0.0000 | 3.354E-05 | 0.0502 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.617E-06 | 0.0024 |
| Ra-228 | 7.477E-05 | 0.1119 | 2.9C2E-10 | 0.0000 | 4.401E-05 | 0.0658 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.395E-06 | 0.0036 |
| Th-228 | 1.283E-04 | 0.1919 | 7.917E-09 | 0.0000 | 4.846E-07 | 0.0007 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.475E-07 | 0.0013 |
| Th-230 | 2.453E-08 | 0.0000 | 2.819E-09 | 0.0000 | 1.636E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.773E-07 | 0.0006 |
| Th-232 | 5.801E-09 | 0.0000 | 2.413E-09 | 0.0000 | 1.030E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.431E-07 | 0.0004 |
| U-234 | 4.055E-12 | 0.0000 | 6.024E-13 | 0.0000 | 1.753E-10 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.576E-10 | 0.0000 |
| U-235 | 5.330E-07 | 0.0008 | 3.300E-11 | 0.0000 | 1.108E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.008E-08 | 0.0000 |
| U-238 | 2.003E-06 | 0.0030 | 5.537E-10 | 0.0000 | 2.481E-07 | 0.0004 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.348E-07 | 0.0004 |
| Total | 5.185E-04 | 0.7757 | 2.607E-08 | 0.0000 | 1.372E-04 | 0.2052 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.270E-05 | 0.0190 |

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Plant | | Meat | | Milk | | All Pathways** | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|----------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 1.711E-05 | 0.0256 |
| Pa-231 | 0.000E+00 | 0.0000 | 2.923E-06 | 0.0044 |
| Pb-210 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.300E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.278E-05 | 0.0939 |
| Ra-226 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.300E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.309E-04 | 0.4950 |
| Ra-228 | 0.000E+00 | 0.0000 | 1.212E-04 | 0.1813 |
| Th-228 | 0.000E+00 | 0.0000 | 1.296E-04 | 0.1939 |
| Th-230 | 0.000E+00 | 0.0000 | 5.682E-07 | 0.0009 |
| Th-232 | 0.000E+00 | 0.0000 | 3.543E-07 | 0.0005 |

| | | | | | | | | | | | | |
|--------------|------------------|---------------|------------------|---------------|------------------|---------------|------------------|---------------|------------------|---------------|------------------|---------------|
| U-234 | 0.000E+00 | 0.0000 | 3.376E-10 | 0.0000 |
| U-235 | 0.000E+00 | 0.0000 | 5.542E-07 | 0.0008 |
| U-238 | 0.000E+00 | 0.0000 | 2.486E-06 | 0.0037 |
| Total | 0.000E+00 | 0.0000 | 6.685E-04 | 1.0000 |

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

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Intrinsic : SLDS Background Mean_Accessible Soil Resident
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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+02 years

| Radon Pathway | Radionuclides | | | | | | | |
|---------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
| Water-ind. | 0.000E+00 |
| Water-dep. | 0.000E+00 |
| Total | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

0 Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

| Radio-Nuclide | Water Independent Pathways (Inhalation excludes radon) | | | | | | | | Meat | | Milk | | Soil | | |
|---------------|--|---------------|------------------|---------------|------------------|---------------|------------------|---------------|------------------|---------------|------------------|---------------|------------------|---------------|--------|
| | Ground | | Inhalation | | Radon | | Plant | | risk | fract. | risk | fract. | risk | fract. | |
| risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 8.279E-11 | 0.0000 | 3.936E-14 | 0.0000 | 0.000E+00 | 0.0000 | 4.279E-12 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.137E-12 | 0.0000 | |
| Pa-231 | 1.703E-05 | 0.0255 | 9.038E-09 | 0.0000 | 0.000E+00 | 0.0000 | 1.951E-06 | 0.0029 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.033E-06 | 0.0015 | |
| Ra-226 | 2.664E-04 | 0.3985 | 2.716E-09 | 0.0000 | 0.000E+00 | 0.0000 | 8.183E-05 | 0.1224 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.864E-06 | 0.0103 | |
| Ra-228 | 1.060E-20 | 0.0000 | 4.827E-25 | 0.0000 | 0.000E+00 | 0.0000 | 1.777E-21 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.454E-22 | 0.0000 | |
| Th-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | |
| Th-230 | 2.952E-05 | 0.0442 | 3.101E-09 | 0.0000 | 0.000E+00 | 0.0000 | 8.560E-06 | 0.0128 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.067E-06 | 0.0016 | |
| Th-232 | 2.031E-04 | 0.3038 | 1.062E-08 | 0.0000 | 0.000E+00 | 0.0000 | 4.459E-05 | 0.0667 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.486E-06 | 0.0052 | |
| U-235 | 5.422E-07 | 0.0008 | 3.795E-11 | 0.0000 | 0.000E+00 | 0.0000 | 1.219E-08 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.065E-08 | 0.0000 | |
| U-238 | 2.003E-06 | 0.0030 | 5.543E-10 | 0.0000 | 0.000E+00 | 0.0000 | 2.482E-07 | 0.0004 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.350E-07 | 0.0004 | |
| Total | 5.185E-04 | 0.7757 | 2.607E-08 | 0.0000 | 0.000E+00 | 0.0000 | 1.372E-04 | 0.2052 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.270E-05 | 0.0190 | |

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Intrinsic : SLDS Background Mean_Accessible Soil Resident
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Radon | | Plant | | Meat | | Milk | | All pathways | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|--------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 9.124E-11 | 0.0000 |
| Pa-231 | 0.000E+00 | 0.0000 | 2.002E-05 | 0.0300 |
| Ra-226 | 0.000E+00 | 0.0000 | 3.551E-04 | 0.5312 |
| Ra-228 | 0.000E+00 | 0.0000 | 1.252E-20 | 0.0000 |
| Th-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 |
| Th-230 | 0.000E+00 | 0.0000 | 3.915E-05 | 0.0586 |
| Th-232 | 0.000E+00 | 0.0000 | 2.512E-04 | 0.3757 |
| U-235 | 0.000E+00 | 0.0000 | 5.651E-07 | 0.0008 |
| U-238 | 0.000E+00 | 0.0000 | 2.487E-06 | 0.0037 |
| Total | 0.000E+00 | 0.0000 | 6.685E-04 | 1.0000 |

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides
 IRESRAD, Version 6.5 T% Limit = 180 days 12/04/2013 15:14 Page 33
 Intrisk : SLDS Background Mean Accessible Soil Resident
 File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\BKGD MEAN ACC RESIDENT.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As pCi/yr at t= 1.000E+03 years

| Radio-Nuclide | Water Independent Pathways (Inhalation w/o radon) | | | | | Water Dependent Pathways | | | | | Total Ingestion* |
|---------------|---|-----------|-----------|-----------|-----------|--------------------------|-----------|-----------|-----------|-----------|------------------|
| | Inhalation | Plant | Meat | Milk | Soil | Water | Fish | Plant | Meat | Milk | |
| Ac-227 | 7.133E-04 | 2.486E+01 | 0.000E+00 | 0.000E+00 | 1.347E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 3.833E+01 |
| Pa-231 | 7.365E-04 | 1.023E+02 | 0.000E+00 | 0.000E+00 | 1.391E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.162E+02 |
| Pb-210 | 2.772E-03 | 3.863E+02 | 0.000E+00 | 0.000E+00 | 5.234E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 4.386E+02 |
| Ra-226 | 2.765E-03 | 1.536E+03 | 0.000E+00 | 0.000E+00 | 5.220E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.588E+03 |
| Ra-228 | 1.849E-03 | 1.023E+03 | 0.000E+00 | 0.000E+00 | 3.492E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.058E+03 |
| Th-228 | 1.849E-03 | 3.823E+01 | 0.000E+00 | 0.000E+00 | 3.492E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 7.315E+01 |
| Th-230 | 3.276E-03 | 4.553E+01 | 0.000E+00 | 0.000E+00 | 6.185E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.074E+02 |
| Th-232 | 1.857E-03 | 2.581E+01 | 0.000E+00 | 0.300E+00 | 3.506E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.088E+01 |
| U-234 | 3.424E-06 | 1.189E-01 | 0.000E+00 | 0.000E+00 | 6.465E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.836E-01 |
| U-235 | 6.674E-05 | 2.318E+00 | 0.000E+00 | 0.000E+00 | 1.260E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 3.578E+00 |
| U-238 | 1.210E-03 | 4.202E+01 | 0.000E+00 | 0.000E+00 | 2.284E+01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 6.486E+01 |

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
 and water-dependent water, fish, plant, meat, milk pathways

0 Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
 Radon and its Decay Products as pCi/yr at t= 1.000E+03 years

0 Radon
 Pathway Rn-222 Po-218 Pb-214 Bi-214 Rn-220 Po-216 Pb-212 Bi-212

| | | | | | | | | |
|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Water-ind. | 0.000E+00 |
| Water-dep. | 0.000E+00 |
| Total | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent
 1RESRAD, Version 6.5 T½ Limit = 180 days 12/04/2013 15:14 Page 34
 Intrisk : SLDS Background Mean Accessible Soil Resident
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+03 years

| Radio-Nuclide | Water Independent Pathways (Inhalation excludes radon) | | | | | | | | | | | |
|---------------|--|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | Ground | | Inhalation | | Plant | | Meat | | Milk | | Soil | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 9.288E-06 | 0.0171 | 4.416E-09 | 0.0000 | 4.817E-07 | 0.0009 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.641E-07 | 0.0009 |
| Pa-231 | 9.071E-07 | 0.0017 | 9.944E-10 | 0.0000 | 6.861E-07 | 0.0013 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.543E-07 | 0.0003 |
| Pb-210 | 1.051E-07 | 0.0002 | 1.147E-09 | 0.0000 | 3.964E-05 | 0.0732 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.152E-06 | 0.0077 |
| Ra-226 | 2.078E-04 | 0.3835 | 9.532E-10 | 0.0000 | 2.357E-05 | 0.0435 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.136E-06 | 0.0021 |
| Ra-228 | 7.474E-05 | 0.1379 | 2.901E-10 | 0.0000 | 4.399E-05 | 0.0812 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.394E-06 | 0.0044 |
| Th-228 | 1.282E-04 | 0.2367 | 7.914E-09 | 0.0000 | 4.844E-07 | 0.0009 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 8.472E-07 | 0.0016 |
| Th-230 | 2.437E-08 | 0.0000 | 2.800E-09 | 0.0000 | 1.625E-07 | 0.0003 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.748E-07 | 0.0007 |
| Th-232 | 5.799E-09 | 0.0000 | 2.412E-09 | 0.0000 | 1.030E-07 | 0.0002 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.430E-07 | 0.0004 |
| U-234 | 7.916E-12 | 0.0000 | 1.176E-12 | 0.0000 | 3.422E-10 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.077E-10 | 0.0000 |
| U-235 | 3.232E-07 | 0.0006 | 2.001E-11 | 0.0000 | 6.718E-09 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.110E-09 | 0.0000 |
| U-238 | 1.214E-06 | 0.0022 | 3.357E-10 | 0.0000 | 1.504E-07 | 0.0003 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.424E-07 | 0.0003 |
| Total | 4.226E-04 | 0.7800 | 2.128E-08 | 0.0000 | 1.093E-04 | 0.2017 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.914E-06 | 0.0183 |

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+03 years

Water Dependent Pathways

| Radio-Nuclide | Water | | | | | | | | Fish | | Plant | | Meat | | Milk | | All Pathways** | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|----------------|--------|-----------|--------|------|--------|----------------|--------|
| | Water | | Fish | | Plant | | Meat | | Milk | | All Pathways** | | | | | | | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.024E-05 | 0.0189 | | | | |
| Pa-231 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.748E-06 | 0.0032 | | | | |
| Pb-210 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 4.390E-05 | 0.0810 | | | | |
| Ra-226 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.325E-04 | 0.4291 | | | | |
| Ra-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.211E-04 | 0.2235 | | | | |
| Th-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.296E-04 | 0.2391 | | | | |
| Th-230 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 5.644E-07 | 0.0010 | | | | |
| Th-232 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.542E-07 | 0.0007 | | | | |
| U-234 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.590E-10 | 0.0000 | | | | |

| | | | | | | | | | | | | |
|-------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| U-235 | 0.000E+00 | 0.0000 | 3.360E-07 | 0.0006 |
| U-238 | 0.000E+00 | 0.0000 | 0.000E-00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.508E-06 | 0.0028 |
| Total | 0.000E+00 | 0.0000 | 5.418E-04 | 1.0000 |

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways
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Intrinsic : SLDS Background Mean_Accessible Soil Resident
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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+03 years

| Radionuclides | | | | | | | | |
|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Radon Pathway | Rn-222 | Po-218 | Pb-214 | Bi-214 | Rn-220 | Po-216 | Pb-212 | Bi-212 |
| Water-ind. | 0.000E+00 |
| Water-dep. | 0.000E+00 |
| Total | 0.000E+00 |

Water-ind. == Water-independent Water-dep. == Water-dependent

| Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p) and Fraction of Total Risk at t= 1.000E+03 years | | | | | | | | | | | | | | |
|---|-----------|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| Water Independent Pathways (Inhalation excludes radon) | | | | | | | | | | | | | | |
| Radio-Nuclide | Ground | | Inhalation | | Radon | | Plant | | Meat | | Milk | | Soil | |
| | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | fract. | risk | |
| Ac-227 | 5.027E-21 | 0.0000 | 2.390E-24 | 0.0000 | 0.000E+00 | 0.0000 | 2.598E-22 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.512E-22 | 0.0000 |
| Pa-231 | 1.018E-05 | 0.0188 | 5.400E-09 | 0.0000 | 0.000E+00 | 0.0000 | 1.166E-06 | 0.0022 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 6.172E-07 | 0.0011 |
| Ra-226 | 1.375E-04 | 0.2538 | 1.402E-09 | 0.0000 | 0.000E+00 | 0.0000 | 4.225E-05 | 0.0780 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.544E-06 | 0.0065 |
| Ra-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 |
| Th-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 |
| Th-230 | 7.041E-05 | 0.1299 | 3.499E-09 | 0.0000 | 0.000E+00 | 0.0000 | 2.113E-05 | 0.0390 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 2.119E-06 | 0.0039 |
| Th-232 | 2.030E-04 | 0.3746 | 1.062E-08 | 0.0000 | 0.000E+00 | 0.0000 | 4.458E-05 | 0.0823 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 3.484E-06 | 0.0064 |
| U-235 | 3.423E-07 | 0.0006 | 3.017E-11 | 0.0000 | 0.000E+00 | 0.0000 | 8.939E-09 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 7.274E-09 | 0.0000 |
| U-238 | 1.215E-06 | 0.0022 | 3.369E-10 | 0.0000 | 0.000E+00 | 0.0000 | 1.508E-07 | 0.0003 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 1.427E-07 | 0.0003 |
| Total | 4.226E-04 | 0.7800 | 2.128E-08 | 0.0000 | 0.000E+00 | 0.0000 | 1.093E-04 | 0.2017 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 9.914E-06 | 0.0183 |

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Intrinsic : SLDS Background Mean_Accessible Soil Resident
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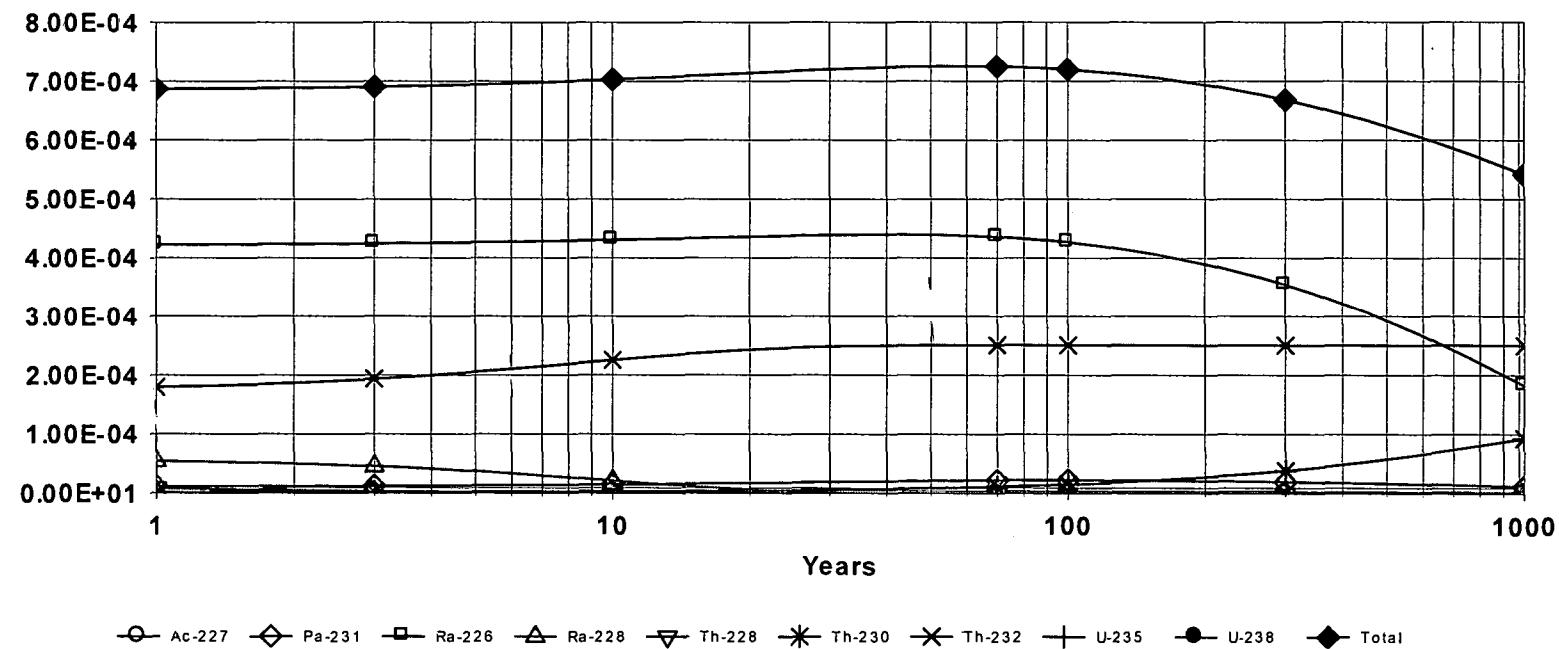
Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

Water Dependent Pathways

| Radio-Nuclide | Water | | Fish | | Radon | | Plant | | Meat | | Milk | | All pathways | |
|---------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|--------------|--------|
| | risk | fract. | risk | fract. |
| Ac-227 | 0.000E+00 | 0.0000 | 5.540E-21 | 0.0000 |
| Pa-231 | 0.000E+00 | 0.0000 | 1.196E-05 | 0.0221 |
| Ra-226 | 0.000E+00 | 0.0000 | 1.833E-04 | 0.3383 |
| Ra-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 |
| Th-228 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 |
| Th-230 | 0.000E+00 | 0.0000 | 9.366E-05 | 0.1729 |
| Th-232 | 0.000E+00 | 0.0000 | 2.510E-04 | 0.4633 |
| U-235 | 0.000E+00 | 0.0000 | 3.585E-07 | 0.0007 |
| U-238 | 0.000E+00 | 0.0000 | 1.508E-06 | 0.0028 |
| Total | 0.000E+00 | 0.0000 | 5.418E-04 | 1.0000 |

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

EXCESS CANCER RISK: All Nuclides Summed, All Pathways Summed



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