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Dear Regulatory Team Members:

Enclosed is the Final Radiological Addendum for the Feasibility Study for Parcel C, Hunters Point shipyard, San Francisco, California. Thank you for your comments on this report. The Final Response to Comments document is included as Appendix D.

Should you have concerns regarding this matter, please contact Ms. Sarah Koppel at (619) 532-0962, or Mr. Keith Forman at keith.s.forman@navy.mil.

Sincerely,  
  
KEITH FORMAN  
BRAC Environmental Coordinator  
By direction of the Director

Enclosures: (1) Final Radiological Addendum for the Feasibility Study for Parcel C, Hunters Point Shipyard, San Francisco, California, June 2008

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**CONTRACT No. N62473-06-D-2201  
CTO No. 0006**

**FINAL**  
**RADIOLOGICAL ADDENDUM TO THE REVISED  
FEASIBILITY STUDY REPORT FOR PARCEL C**  
**June 20, 2008**

**DCN: ECSD-2201-0006-0077**

**PARCEL C, HUNTERS POINT SHIPYARD  
SAN FRANCISCO, CALIFORNIA**

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**PARCEL C, HUNTERS POINT SHIPYARD  
SAN FRANCISCO, CALIFORNIA**

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## EXECUTIVE SUMMARY

The Department of the Navy has prepared this Radiological Addendum to the Revised Feasibility Study Report for Parcel C (Addendum) to address potential radioactive contamination in buildings, former building sites, soil, groundwater, and storm water and sanitary sewers within Parcel C at Hunters Point Shipyard (HPS). HPS is a deactivated Department of the Navy (DON) shipyard on San Francisco Bay in southeastern San Francisco, California. This Addendum provides information to support the future Proposed Plan and Record of Decision (ROD) by re-evaluating remedial alternatives that address soil, groundwater, buildings, and storm water and sanitary sewers that may pose a radiological risk.

The primary purpose of this Addendum is to provide decision makers and stakeholders with the information necessary to select a final remedy for radiologically-impacted buildings (203, 205 and its discharge channel, 211, 214, 224, 241, 253, 271, and 272), and the storm water and sanitary sewer system. This is accomplished through the development and evaluation of remedial alternatives. The alternatives in this document are similar to those identified in the Revised Feasibility Study Report for Parcel C (SulTech, 2007). In addition, alternatives are recommended for Parcel C radiologically-impacted buildings and the storm water and sanitary sewer system. The following steps were used to achieve this purpose:

1. Development of a conceptual site model that summarizes the Hunters Point Shipyard and Parcel C historical background, nature of the contaminant release, environmental media impacted, fate and transport of radionuclides of concern in the environment, potential receptors and exposure pathways, and a risk assessment.
2. Development of remedial action objectives for radioactively contaminated media.
3. Development of general response actions (e.g., remediation, demolition, excavation, or containment) that may be taken to satisfy the remedial action objectives. The general response actions are similar in scope to those established in the Revised Feasibility Study Report for Parcel C (SulTech, 2007) along with additional general response actions for radiologically-impacted buildings and the storm water and sanitary sewer system.
4. Identification of radiologically-impacted buildings where general response actions will be applied.
5. Identification and evaluation of technology options applicable for each general response action based on the ability of each to achieve the remedial action objectives, technical and administrative implementability, and cost.
6. Delineation of selected representative technologies and process options as they correspond to different general response actions to develop a range of remedial alternatives.

7. Detailed analysis of remedial alternatives based on seven of the nine evaluation criteria in the National Oil and Hazardous Substances Pollution and Contingency Plan (40 Code of Federal Regulations, § 300.430 [e][9][iii]).
8. Comparative analyses of alternatives for each of the evaluation criteria to identify the relative advantages and disadvantages of each alternative.

HPS is a former DON shipyard located in the extreme southeast of the City and County of San Francisco, California on a promontory extending eastward into San Francisco Bay. Currently, HPS property includes approximately 866 acres, about 446 of which are offshore.

The shipyard is divided into six parcels: B, C, D, E, E-2, and F. The shipyard property previously included Parcel A, which was transferred to the San Francisco Redevelopment Agency in December 2004 and is no longer DON property. This Addendum focuses on Parcel C only.

Parcel C is located in the northeast-central quadrant of Hunters Point Shipyard. Multiple buildings (203, 205 and its discharge channel, 211, 214, 224, 241, 253, 271, and 272), storm drains and sanitary sewer piping are considered radiologically-impacted. Radiological operations within these areas included suspected burning of radiologically-contaminated fuel from OPERATION CROSSROADS ships, pumping potentially contaminated water from Drydock 2, storage of low-level radioactive waste by a contractor, Naval Radiological Defense Laboratory Health Physics counting room, storage of samples from atomic weapons testing, use of firebrick containing naturally radioactive material, radiography source operations, potential radium paint use and disposal, and maintenance and storage of radioluminescent devices. Drydocks 2, 3, 4, and the ships' berths are not part of Parcel C, having been reassigned to Parcel F. The table below shows the various Parcel C structures, their impacted redevelopment block number, planned reuses, and exposure scenario.

<b>Building/Site Number</b>	<b>Impacted Redevelopment Block</b>	<b>Planned Reuse</b>	<b>Reuse Scenario<sup>a</sup></b>
203	23	Research and Development	Residential
205 and Discharge Channel	22	Educational/Cultural	Industrial
211	25 and COS-3	Educational/Cultural and Open Space	Industrial and Recreational
214	20B	Educational/Cultural	Industrial
224	25	Educational/Cultural	Industrial
241	18	Research and Development	Residential
253	25	Educational/Cultural	Industrial
271	24	Research and Development	Residential
272	24	Research and Development	Residential
Sanitary Sewers	All Blocks	Industrial, Maritime-Industrial, Mixed Use, and Research and Development	Residential
Storm Drains	All Blocks	Industrial, Maritime-Industrial, Mixed Use, and Research and Development	Residential

*Notes:*

<sup>a</sup> The most conservative risk model appropriate for the given planned reuse was utilized.

Most of Parcel C is situated in the lowlands, with surface elevations between zero and ten feet above mean sea level (SulTech, 2007). No threatened or endangered species are known to inhabit Parcel C whose ecology is limited to plant and animal species adapted to an industrial environment. Viable terrestrial habitat is inhibited at Parcel C because more than 90 percent of the ground surface is covered by pavement and former industrial buildings (SulTech, 2007).

The radionuclides of concern associated with Parcel C buildings include cesium-137, cobalt-60, plutonium-239, radium-226, strontium-90, thorium-232, potassium-40, and naturally occurring radioactive materials found in firebrick (primarily thorium-232). The radionuclides of concern associated with the Parcel C storm water and sanitary sewers are cesium-137, radium-226, and strontium-90 (Naval Sea Systems Command, 2004).

Radioluminescent devices were commonly used on Navy ships and shore installations through the late 1960s. The radionuclides associated with these devices are radium-226 and strontium-90. In addition to being used as a Department of the Navy shipyard, Hunters Point Shipyard was home to the nascent Radiation Safety Section and its Radiation Laboratory and their successor the Naval Radiological Defense Laboratory whose primary mission was to study the effects of atomic weapons. Numerous ships that participated in atomic weapons testing from 1946 through the early 1960s were returned to Hunters Point Shipyard for storage before disposal, decontamination and experimentation with decontamination techniques. Many of these ships participated in the two original atomic weapons tests at Bikini Atoll during OPERATION CROSSROADS in 1946. Ships' berths (piers) are known locations of decontamination operations, and residues from these operations were potentially discharged into both San Francisco Bay and the sanitary and storm drain system. Only discharges into the sanitary and storm drain system in Parcel C are considered in this addendum.

Originally, the sanitary and storm water sewer systems were combined with outfalls to San Francisco Bay. The DON attempted to separate these systems at various times during HPS operations, but the lines were never completely separated. Therefore, some lines remain combined today. The lines are considered radiologically-impacted because operations at HPS resulted in the disposal of radioactive materials through these systems. These included materials from ship and personnel decontamination, fallout samples, and radioactive materials from the refurbishment of radioluminescent devices, including radium-bearing paint.

The geologic setting at Parcel C includes the following geologic units, from youngest (shallowest) to oldest (deepest): Artificial Fill, Undifferentiated Upper Sand Deposits, Bay Mud Deposits, Undifferentiated Sediments, and Bedrock. The hydrostratigraphic units at Parcel C are the A-aquifer, the Bay Mud aquitard zone, the B-aquifer, and a bedrock water-bearing zone (SulTech, 2007). Parcel C groundwater has not been analyzed for radiological constituents.

The remedial action objectives for radionuclides of concern in Parcel C were developed based on the media of concern, potential exposure pathways, and applicable or relevant and appropriate requirements. The following remedial action objectives were identified for radiologically-impacted buildings and the storm water and sanitary sewer system:

- Prevent ingestion, dermal contact, or inhalation of ROCs in concentrations that significantly exceed background concentrations.
- Assure that the total effective dose from radiologically-impacted sites to any member of the public does not exceed 25 millirems per year.
- Ensure that the increased lifetime cancer risk does not exceed the risk range of  $10^{-6}$  to  $10^{-4}$  for future use scenarios.

The following alternatives were identified in the Revised Feasibility Study Report for Parcel C (SulTech, 2007) and modified to satisfy the remedial action objectives listed above. The alternatives are grouped S for soil, GW for groundwater, and R for radiologically-impacted sites.

- Alternative S-1: No Action: For this alternative, no remedial action would be taken. Radionuclides of concern would be left in place. The no-action response is retained through the evaluation process as required by the National Oil and Hazardous Substances Pollution Contingency Plan to provide a baseline for comparison with other alternatives.
- Alternative S-2: Institutional Controls and Maintained Landscaping: Alternative S-2 includes institutional controls and maintained landscaping that together would meet all applicable or relevant and appropriate requirements and remedial action objectives. The ICs include parcel-wide access restrictions and covenants to restrict use of impacted property for all redevelopment blocks. Maintained landscaping would also prevent potential exposure to asbestos that may be present in surface soil and transported by wind erosion that would not be addressed by institutional controls alone.
- Alternative S-3: Excavation, Disposal, Institutional Controls, and Maintained Landscaping: Alternative S-3 consists of excavation, off-site disposal, institutional controls, and maintained landscaping similar to Alternative S-2. Areas with elevated concentrations of lead, mercury, zinc, and organic chemicals would be excavated to reduce the concentrations of these chemicals to meet remediation goals.
- Alternative S-4: Covers and Institutional Controls: Alternative S-4 consists of covers (physical barriers) to block the exposure pathway to soil chemicals and institutional controls over all the redevelopment blocks similar to Alternatives S-2 and S-3.
- Alternative S-5: Excavation, Disposal, Covers, Soil Vapor Extraction, and Institutional Controls: Alternative S-5 consists of a combination of soil excavation and off-site disposal, covers, soil vapor extraction, and institutional controls. This alternative was developed as a combined alternative to 1) remove and dispose of lead, mercury, zinc, and organic chemicals of concern as described in Alternative S-

3, 2) implement and maintain block-wide covers as described in Alternative S-4, and 3) implement the appropriate institutional controls.

- Alternative GW-1: No Action: For this alternative, no remedial action will be taken for groundwater. Groundwater will be left as is, without implementing any response actions. The no-action response is retained throughout the evaluation process as required by the National Oil and Hazardous Substances Pollution Contingency Plan to provide a baseline for comparison with other alternatives.
- Alternative GW-2: Long-term Groundwater Monitoring and Institutional Controls: Alternative GW-2 consists of groundwater monitoring and institutional controls. This alternative was developed as a method for monitoring contaminants present at low concentrations in groundwater. Additionally, groundwater monitoring would be used to confirm site conditions. Institutional controls are also included in this alternative to effectively manage risk by preventing exposure from use of the groundwater. Groundwater monitoring for the radionuclides of concern would be used to confirm site conditions and ensure that, over time, the potential exposure pathway remains incomplete. It is assumed that 132 groundwater wells in Remedial Unit-C1, Remedial Unit-C2, Remedial Unit-C4, and Non-Plume areas that are in or near radiologically-impacted buildings will be analyzed for radionuclides of concern when sampled for chemicals of concern.
- Alternative GW-3A: In-situ Bioremediation, Long-Term Groundwater Monitoring, and Institutional Controls: Groundwater Monitoring and Institutional Controls: Alternative GW-3A consists of in-situ sequential anaerobic then aerobic treatment of the chemical plumes followed by monitored natural attenuation, and institutional controls similar to Alternative GW-2. Groundwater monitoring for the radionuclides of concern would be used to confirm site conditions and ensure that, over time, the potential exposure pathway remains incomplete. It is assumed that 132 groundwater wells in Remedial Unit-C1, Remedial Unit-C2, Remedial Unit-C4, and Non-Plume areas that are in or near radiologically-impacted buildings will be analyzed for radionuclides of concern when sampled for chemicals of concern.
- Alternative GW-3B: In-situ Zero-Valent Iron Reduction, Bioremediation, Long-Term Alternative GW-3B includes an initial stage of zero-valent iron reduction at appropriate plumes followed by bioremediation. Zero-valent iron is injected as a slurry to create a chemically reducing environment in the aquifer that breaks down the chlorinated chemicals. Alternative 3B also includes the option to use bioremediation at plumes where further treatment is required or where aerobic treatment is necessary. These alternatives were selected to reduce the required time to meet the groundwater remedial action objectives compared to institutional controls alone. Groundwater monitoring for the radionuclides of concern would be used to confirm site conditions and ensure that, over time, the potential exposure pathway remains incomplete. It is assumed that 132 groundwater wells in Remedial Unit-C1, Remedial Unit-C2, Remedial Unit-C4, and Non-Plume that are in or near radiologically-impacted buildings will be analyzed for radionuclides of concern when sampled for chemicals of concern.

- Alternative R-1: No Action: No remedial action would be taken for radiologically-impacted sites. The no-action response is retained through the evaluation process as required by the National Oil and Hazardous Substances Pollution Contingency Plan to provide a baseline for comparison with other alternatives.
- Alternative R-2: Survey, Decontamination, Disposal, Release, and Institutional Controls: Alternative R-2 consists of decontamination of radiologically-impacted buildings and dismantlement if necessary. Buildings, trenches resulting from sewer and storm line removal, and remediated storm drain and sanitary sewer piping and associated soils would be surveyed to meet the remediation goals. The Building 205 shaft below 10 feet would not be surveyed or released due to the building's deteriorated condition, health and safety hazards, and other uncertainties. Institutional controls would be assigned to the Building 205 shaft below 10 feet and associated piping.
- Alternative R-3: Survey, Decontamination, Disposal, Release, Close In-Place, and Institutional Controls: Buildings, trenches resulting from sewer and storm line removal, and remediated storm drain and sanitary sewer piping and associated soils would be radiologically surveyed, decontaminated, or dismantled and disposed of as necessary to meet the remediation goals. This alternative assumes that the Building 205 shaft below 10 feet will not be released. It will be closed in-place with backfilled stone and a concrete cap, and institutional controls will be assigned.

Each remedial alternative developed in the Revised Feasibility Study Report for Parcel C (SulTech, 2007) and this Addendum was evaluated in comparison to the two threshold and five balancing National Oil and Hazardous Substances Pollution Contingency Plan evaluation criteria. Comparison to the two modifying criteria of regulatory and community acceptance will be included in the final Revised Feasibility Study Report for Parcel C report, this addendum, and future proposed plans after comments are received. Further discussion of these criteria is not included in this report. A comparative analysis was then conducted to evaluate the relative performance of the five soil, four groundwater, and three radiologically-impacted site remedial alternatives developed for Parcel C.

An overall rating was assigned to each alternative. Each of Alternatives S-2 through S-5 meets the threshold criteria. Alternative S-5 is rated excellent overall for the two threshold and five balancing National Oil and Hazardous Substances Pollution Contingency Plan evaluation criteria. Alternative S-5 is the most effective, with both excavation and covers, and no additional cost (\$zero million) associated with the radiological support required. Alternative S-3, rated good, is more effective than Alternative S-2 because contaminants are removed and no additional cost (\$zero million) is required. Alternative S-4, rated very good, is not more effective than Alternatives S-3 or S-5 and is similar in cost (\$zero million) to Alternative S-2. Alternative S-2, rated good, is easiest to implement and costs (\$zero million). Alternative S-1 is rated not acceptable.

Alternatives GW-3A and GW-3B, which only sample and analyze for radioactive material, are rated very good. Alternative GW-3A has an additional cost of \$2.28 million and Alternative GW-3B has an additional cost of \$2.34 million for radiological monitoring. Alternative GW-2, rated good, is easy to implement at an additional cost of \$1.2 million. Alternative GW-1 is rated as not acceptable.

Alternative R-3, rated very good, has the highest overall rating and cost of \$29.7 million. Alternative R-2 is rated as next highest with the next highest cost of \$29.0 million and Alternative R-1 is rated not acceptable.

Figure ES-1 summarizes the results of this evaluation.

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## ABBREVIATIONS AND ACRONYMS

§	section
AEC	Atomic Energy Commission
ALARA	as low as reasonably achievable
ARAR	applicable or relevant and appropriate requirement
ARIC	area requiring institutional control
BRAC PMO	Base Realignment and Closure Program Management Office West
CCR	California Code of Regulations
CDPH	California Department of Public Health
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
cm <sup>2</sup>	square centimeter
CMI	Parcel C Maritime/Industrial
<sup>60</sup> Co	cobalt-60
COS	Parcel C Open Space
<sup>137</sup> Cs	cesium-137
DoD	Department of Defense
DON	Department of Navy
dpm	disintegration per minute
DTSC	Department of Toxic Substances Control
ELCR	excess lifetime carcinogenic risk
EPA	U.S. Environmental Protection Agency
FFA	Federal Facility Agreement
FS	Feasibility Study
FSS	Final Status Survey
GRA	general response action
HPS	Hunters Point Shipyard
hr	hour
HRA	Historical Radiological Assessment
IC	institutional control
<sup>40</sup> K	potassium-40
LLRW	low-level radioactive waste

## ABBREVIATIONS AND ACRONYMS

(Continued)

MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MCL	maximum contaminant level
mrem/y	millirem per year
msl	mean sea level
NAVFAC SW	Naval Facilities Engineering Command, Southwest
NAVSEA	Naval Sea Systems Command
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NRC	Nuclear Regulatory Commission
NRDL	Naval Radiological Defense Laboratory
O&M	operation and maintenance
pCi/g	picocurie(s) per gram
<sup>239</sup> Pu	plutonium-239
<sup>226</sup> Ra	radium-226
RADLAB	Radiation Laboratory
RAO	Remedial Action Objective
RASO	Radiological Affairs Support Office
RESRAD	Residual Radioactivity (Model)
RESRAD-BUILD	Residual Radioactivity-Building (Model)
RG	Remediation Goal
ROC	radionuclide of concern
ROD	Record of Decision
RSS	Radiological Safety Section
SFRA	San Francisco Redevelopment Agency
<sup>90</sup> Sr	strontium-90
<sup>232</sup> Th	thorium-232
VOC	volatile organic compound

## 1.0 INTRODUCTION

The Department of the Navy (DON) has prepared this Radiological Addendum to the Revised Feasibility Study Report for Parcel C (Addendum) under Remedial Action Contract (RAC) N62473-06-D-2201, Contract Task Order (CTO) No. 0006 to address potential radioactive contamination in buildings, former building sites, soil, groundwater, and storm water and sanitary sewer systems situated within Parcel C at Hunters Point Shipyard (HPS), San Francisco, California. The DON is represented by the Base Realignment and Closure Program Management Office West (BRAC PMO), Naval Facilities Engineering Command, Southwest (NAVFAC SW), and the Navy's Radiological Affairs Support Office (RASO). This Addendum supplements the Revised Feasibility Study (FS) Report for Parcel C (SulTech, 2007) prepared under RAC No. N62473-06-D-2201, CTO 0003, which addresses chemical contamination, but not the radiological hazards associated with Parcel C. This Addendum concentrates specifically on Parcel C and, with the exception of any HPS background information that is needed for clarity, does not repeat the historical or background documentation provided in the Revised FS Report (SulTech, 2007). This Addendum complies with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

HPS has been divided into six parcels: B, C, D, E, E-2, and F. The former Parcel A has been transferred to the San Francisco Redevelopment Agency. Parcel C has experienced several boundary changes over the years. Installation Restoration (IR) Sites 06 and 25 were transferred from Parcel B to Parcel C in 2002 and a portion of Parcel A was transferred to Parcel C in 2004. This Addendum addresses the area within the Parcel C boundary as redefined in March 2004.

Parcel C is at the feasibility study (FS) stage in the CERCLA remedial process. Draft and Draft Final FS Reports were developed in 1997 and 1998 for Parcel C. Following the Draft Final FS Report, the Navy and the regulatory agencies conducted a risk management review that refined the areas for the proposed response action. The Navy then conducted an interim removal action at Parcel C and a groundwater data gaps investigation. The Revised FS Report for Parcel C (SulTech, 2007) updated the 1998 report and included additional information from remedial activities performed in the interim. This Addendum addresses potential radiological hazards associated with Parcel C,

### 1.1 PURPOSE

This Addendum provides decision-makers and stakeholders with the information necessary to select final remedies for groundwater, buildings and associated structures, and storm water and sanitary sewer system components that are radiologically-impacted. Alternatives are presented for those Parcel C sites affected by the radionuclides of concern (ROCs) identified in the

Historical Radiological Assessment (HRA) (Naval Sea Systems Command [NAVSEA], 2004). The overall objective of this document is provide information to support a future Proposed Plan that would align the final radiological remedy for Parcel C with its planned reuse.

The designation “radiologically-impacted” means that a site (buildings and associated structures, groundwater, and storm water and sanitary sewer components) has the potential for radioactive contamination based on available historical information or is known to be contaminated with radioactive material based on survey results. For the purposes of this document, radiologically-impacted sites will be referred to as “impacted”. An assessment of these impacted Parcel C sites is documented in the HRA (NAVSEA, 2004).

The following guidelines were used for preparation of this Addendum:

- *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA*; Interim Final – U.S. Environmental Protection Agency (EPA) Guidance (EPA 540-G-89-004) (EPA, 1988).
- *Technology Screening Guide for Radioactively Contaminated Sites* – EPA Guidance (EPA 402-R-96-017) (EPA, 1996).
- The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (Title 40 of the Code of Federal Regulations [CFR], Section 300.430 [40 CFR 300]).
- *Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination*, Attachment A, USEPA, OSWER Directive 9200.4-18 (EPA, 1997).

The radiological cleanup alternatives (surveys and remediation) proposed in this document will be performed and coordinated in conjunction with the chemical CERCLA remediation alternatives proposed in the Revised FS Report for Parcel C. This Addendum: 1) helps ensure that worker, public, and environmental exposure to radioactivity is as low as reasonably achievable (ALARA), and 2) evaluates the combined chemical and radiological risk. The Addendum to the Revised FS Report evaluates remedial alternatives to address the impacted sites identified in the HRA (NAVSEA, 2004). The buildings and structures that were designated as impacted include Building 203, Building 205 and its discharge tunnel, Buildings 211, 213, 224, 241, 253, 271, and 272 as well as the Parcel C storm water and sanitary sewer systems.

This Addendum includes the following components:

- Development of a Conceptual Site Model for radiological contamination, including a risk evaluation.
- Identification of the radionuclides of concern (ROCs) and development of the Remedial Action Objectives (RAOs).
- Identification of potential applicable or relevant and appropriate requirements (ARARs) for radionuclides.

- Evaluation of additional costs for soil and groundwater alternatives to include radionuclides.
- Development and identification of remedial alternatives for relevant media for radioactive contamination.
- Evaluation of the remedial alternatives.

A Proposed Plan will be prepared in the future that will align the final radiological remedy for Parcel C with its planned reuse. Both the radiological and chemical contaminants will be addressed in the Proposed Plan.

## 1.2 ORGANIZATION OF ADDENDUM

This Addendum has been organized into the following sections:

- **Section 1.0: Introduction** – This section describes the purpose of this addendum, guidance documents used in its preparation, and organization of the report.
- **Section 2.0: Parcel C Site History and Characterization** – This section presents the site history focusing on the use of radioactive material, potential sources and mechanisms for release of the ROCs, environmental media impacted, fate and transport of the radionuclides in the environment, potential receptors, and exposure pathways.
- **Section 3.0: Risk Evaluation Summary and Remediation Goals** – This section summarizes radiological risk to human health based on the conditions in impacted structures, storm water and sanitary sewer systems, the planned future land and building use, and remediation (cleanup) goals for the ROCs (NAVSEA, 2004).
- **Section 4.0: Remedial Action Objectives, General Response Actions, and Process Options** – This section discusses remedial action objectives (RAOs), including identification of ARARs, and identification and screening of potential general response actions (GRAs) to satisfy the RAOs.
- **Section 5.0: Development and Description of Remedial Alternatives** – This section includes a detailed description of the remedial alternatives based on the process options selected in Section 4.0 to satisfy the RAOs. Process options recommended for consideration are assembled, singularly or in combination, to create remedial alternatives.
- **Section 6.0: Detailed Analysis of Remedial Alternatives** – This section presents a detailed evaluation of alternatives with respect to the evaluation criteria specified in the NCP (40 CFR, § 300.430[e][9][iii]) to address statutory requirements and preferences of the CERCLA.
- **Section 7.0: References** – This section includes references used to prepare this document. Tables and figures are included following the text. Supporting data, calculations, and evaluations for this Addendum are presented in the following appendices:

- **Appendix A: Parcel C Risk Screening Analysis** presents detailed analyses and discussion of the risks associated with Parcel C residual radioactivity.
- **Appendix B: Remedial Action Alternative Cost Summary Sheets** presents detailed costs and associated assumptions for each alternative.
- **Appendix C: Applicable or Relevant and Appropriate Requirements (ARARs)** identifies and evaluates the applicability of potential federal and State of California ARARs to the alternatives.
- **Appendix D: Response to Comments for the Draft Final Radiological Addendum to the Revised Feasibility Study Report for Parcel C** presents regulatory agency comments and responses.

## 2.0 PARCEL C SITE HISTORY AND CHARACTERIZATION

This section summarizes the site history as it applies to the use of radioactive materials, potential sources of radiological contamination, nature of release, environmental media impacted, fate and transport of ROCs potentially present at Parcel C, potential receptors, and exposure pathways.

### 2.1 BACKGROUND

HPS is a former DON shipyard situated on an irregular promontory extending into San Francisco Bay in the extreme southeast quadrant of the City and County of San Francisco, California (Figure 2-1). A summary of the history of HPS, physical descriptions of the site, and discussions of hydrogeology and geology are included in the Revised FS for Parcel C (SulTech, 2007).

Figure 2-2 shows the division of HPS into six parcels and outlines Parcel C, the focus of this Addendum. Figure 2-3 shows the proposed reuses and the impacted buildings in Parcel C. Figure 2-4 shows the impacted Parcel C storm water and sanitary sewer lines.

#### 2.1.1 HPS and Parcel C Radiological History

Parcel C is located in the northeast-central quadrant of HPS (Figure 2-2). It includes 79 acres of shoreline and lowlands and is described in detail in the Revised FS for Parcel C (SulTech, 2007). Following the acquisition of HPS by the Navy in 1939, operation at HPS involved the use of radioactive materials in buildings throughout the site, including Parcel C. Radiological operations in Parcel C included burning of contaminated fuel from three OPERATION CROSSROADS ships in the Power House (Building 203), pumping potentially contaminated water from Drydock 2, contractor low-level radioactive waste (LLRW) storage, the Naval Radiological Defense Laboratory (NRDL) Health Physics counting room, storage of samples from atomic weapons testing, use of firebrick containing naturally radioactive materials, radiography source operations, potential radium paint use, and the maintenance and storage of radioluminescent devices. According to San Francisco's Redevelopment Plan (San Francisco Redevelopment Agency, 1997), once transferred, Parcel C will be subdivided into blocks and zoned for educational, cultural, mixed use, research and development, industrial, maritime-industrial, and open spaces. The city's proposed reuse areas for Parcel C are shown in Figure 2-3.

Immediately after the end of World War II and prior to the beginning of atomic weapons testing at sea, the DON used the berthing facilities at HPS for anchorage of reserve fleet ships returning from the Pacific. In 1946, berths and drydocks were used for the decontamination of radiologically-contaminated target and support ships returning from the OPERATION CROSSROADS atomic tests conducted at Bikini Atoll in the Marshall Islands. The Navy also experimented with chemical and physical ship decontamination techniques to evaluate their

effectiveness. HPS also used these facilities for the decontamination of other ships that participated in subsequent atomic weapons tests (NAVSEA, 2004).

The Chief of Naval Operations (CNO) recognized the need to study the effects of atomic weapons and ordered as the formation of the Radiological Safety Section (RSS) at HPS in 1946. The RSS became known as the Radiation Laboratory (RADLAB) and on April 21, 1948, the RADLAB became the Naval Radiological Defense Laboratory (NRDL) (NAVSEA, 2004). The NRDL conducted extensive radiological operations at HPS in support of its mission until it was disestablished in 1969. In addition to its naval mission, these operations included managing the receipt and packaging of radioactive waste for deep sea disposal. These wastes were generated at HPS and at other sites around the Bay area.

Historical radiological operations at HPS included the following (NAVSEA, 2004):

- Repair, use, and disposal of radioluminescent commodity items (dials, gauges, and deck markers).
- Use of radioactive sources for gamma radiography for non-destructive testing metal and weld integrity.
- Use of radioactive sources for calibration laboratory operations to ensure radiation survey instrument accuracy.
- Decontamination of and research on ships contaminated during atomic weapons testing.
- Use of various radionuclides for research by the NRDL and its predecessors.
- Receipt and packaging of radioactive waste for deep sea disposal.

The impacted Parcel C areas, including buildings (203, 205 and its discharge channel, 211, 214, 224, 241, 253, 271, and 272) and storm water and sanitary sewer systems, are described with a synopsis of their use in Table 2-1 (NAVSEA, 2004).

### **2.1.2 Historical Radiological Assessments and Results**

Throughout its history, HPS has been assessed for residual contamination from its radiological operations. Assessments were performed by the DON, DON contractors, and federal, state, and local regulatory agencies. These investigations and surveys undertaken at the HPS site include (NAVSEA, 2004):

- 1946 through 1948 Radiation Safety Section (RSS), RADLAB and NRDL decontaminated and surveyed OPERATION CROSSROADS ships and HPS berths and drydocks. There are no surveys for Parcel C sites reported for this period.
- 1955 NRDL surveys to decommission NRDL buildings at HPS. There are no surveys for Parcel C sites reported.

- 1969 NRDL survey for disestablishment of NRDL. There are no surveys for Parcel C sites reported.
- 1969 to 1970 Atomic Energy Commission (AEC) survey to verify the NRDL survey results and to release buildings for reuse. There are no surveys for Parcel C sites reported for this period.
- 1974 HPS survey for base closure. The one-page documentation for this survey, which included Parcel C buildings 214 and 253 does not describe survey or decontamination procedures. The survey for Building 214 included only Room 150 (the NRDL counting room) and the Building 253 survey included only the building's sixth floor. The buildings were released for unrestricted use based on the survey results (NAVSEA, 2004).
- September 1978 RASO survey of former NRDL buildings. There are no surveys for Parcel C buildings or areas reported.
- 1979 RASO resurvey of Buildings 364, 815, and 816. There are no surveys for Parcel C sites reported.
- 1986 U.S. Environmental Protection Agency (EPA) harbor survey at Naval Nuclear Propulsion Program request. There are no surveys for Parcel C sites reported.
- 1988 to 1989 Harding Lawson Associates site reconnaissance. There are no surveys for Parcel C sites reported.
- 1991 to 2001 surveys conducted for the Remedial Investigation program in four phases: Phases I through IV, including the following interim investigations (NAVSEA, 2004).
  - Phase I did not include any survey activities associated with impacted sites in Parcel C.
  - Phase II did not include any survey activities associated with impacted sites in Parcel C.
  - Phase II to Phase III interim study did not include any survey activities associated with impacted sites in Parcel C.
  - Phase III did not include any survey activities associated with impacted sites in Parcel C.
  - Phase IV radiological investigation did not include any survey activities associated with impacted sites in Parcel C.
  - Phase IV to Phase V interim investigations did not include any activities associated with impacted sites in Parcel C.
  - Phase V, beginning in January 2002, scoping and characterization surveys were performed, which included the following activities associated with impacted sites in Parcel C.
    - Building 211: a small area of  $^{232}\text{Th}$  contamination was found on the concrete floor. Remediation of the area of  $^{232}\text{Th}$  contamination and a Final Status Survey (FSS) are recommended.

- Building 214: surveys of the building were completed. Review and approval of the FSS report is pending.
- Building 224: a survey was completed.  $^{137}\text{Cs}$  levels in one cell slightly exceeded release criteria. Sampling apparently removed the contamination. Review and approval of the FSS report is pending.
- Building 241: a survey was completed. Firebrick and potassium nitrate were removed and sent off site for disposal. Review and approval of the FSS report is pending.
- Building 253: the building was surveyed and extensive low-level  $^{137}\text{Cs}$  and  $^{226}\text{Ra}$  contamination was found inside and outside the building and in ventilation ducts. Contamination found on the roof was remediated. Completing the Characterization Survey, remediation of known areas of contamination and an FSS are recommended. A follow-up building characterization survey was performed in 2004.
- Building 271: low-level  $^{226}\text{Ra}$  contamination was found and remediated. The resultant waste was disposed of off site and a resurvey was completed. Review and approval of the FSS report is pending.
- Building 272: a survey was completed. Review and approval of the FSS report is pending.

Table 2-2 identifies each historical radiological study, survey, or report associated with HPS and Parcel C.

## 2.2 NATURE AND MECHANISM OF RELEASE

The radionuclides listed in Table 2-3 are the ROCs identified for Parcel C (NAVSEA, 2004). The potential sources of contamination were RSS, RADLAB and NRDL activities, the handling and refurbishment of radioluminescent devices, radioactive waste accumulation and storage prior to disposal, and decontamination of ships returned from atomic bomb tests. In addition, contaminants from radioactive sources used to perform non-destructive analyses (radiography) are potentially present.

Radioluminescent devices and paint, which typically contained  $^{226}\text{Ra}$ , were used on ships to improve the visibility of dials and gauges in low light conditions and as deck markers. Devices, dials, and gauges were collected from DON ships, stored, and consolidated prior to disposal. Contaminated equipment and materials were removed from atomic weapons target vessels. These items were stored in buildings at HPS, including Building 253. NRDL collected fallout samples from nuclear weapons tests. These samples were stored at various locations at HPS, including Building 224 in Parcel C. In addition to Buildings 224 and 253, the historic record indicates that Buildings 211 and 271 are Parcel C locations where radioactive materials, including radiography sources, were stored (NAVSEA, 2004).

Following the July 1946 OPERATION CROSSROADS atomic weapons tests, contaminated ships were returned to HPS. Three of the vessels contained enough residual fuel oil that the DON opted to burn the oil in the power plants at HPS. The fuel was contaminated with fission products and  $^{239}\text{Pu}$  from the weapons detonations. The contaminated fuel oil was burned in both shore power/steam plants: Building 203 in Parcel C, and Building 521 in Parcel E (NAVSEA 2004).

### **2.3 EXTENT OF RADIOLOGICAL CONTAMINATION**

Historically, radiological surveys have been performed on the grounds, buildings, and other sites at HPS to assess the extent of contamination and the radionuclides present. The HPS Final HRA (NAVSEA, 2004) lists impacted structures and areas. Table 2-4 of this addendum summarizes the Parcel C impacted sites and the radionuclides potentially present at each one.

### **2.4 RADIONUCLIDE FATE AND TRANSPORT**

Radioactive material consists of radionuclides that are unstable and undergo spontaneous transformations by releasing energy until a stable state is reached. This transformation process is known as radioactive decay and is usually accompanied by the emission of charged particles (i.e., alpha and beta particles) or photons of energy including x- or gamma rays. Alpha particles can travel only short distances and cannot penetrate human skin. Beta particles are generally absorbed in the skin and do not pass through the body. Gamma or x-rays can penetrate the human body. Table 2-3 lists the ROCs, their half-lives, and major radiations emitted when the isotopes decay (NAVSEA, 2004). The radionuclides potentially present in Parcel C were either residue from decontamination of ships or workers or residual contamination as a result of NRDL experiments or tests and shipyard operations, including the burning of contaminated fuel oil.

Each potential ROC is transported differently through the environment. Typically, cobalt is not transported well (i.e., concentrated) by plants and animals, while strontium and radium show a moderate to high degree of food chain transport. Cesium tends to have a higher degree of food chain transportability than radium and strontium. Plutonium forms insoluble oxides in the environment that are not readily transported in the food chain (Kathren, 1984).

The overall mobility of the ROCs and the impact mobility has on the conceptual site model does not affect the estimated risk associated with the ROCs because the pathways influenced by the difference in mobility (e.g., plant ingestion, meat and milk ingestion) are not complete and, therefore are not included in the estimated risk.

### **3.0 RISK EVALUATION SUMMARY AND REMEDIATION GOALS**

This section summarizes the potential human health risks from exposure to radionuclides at Parcel C and presents remediation goals for the identified ROCs. Human health risks were evaluated for exposure to the Parcel C storm water and sanitary sewer system and impacted buildings. Exposure to groundwater was not evaluated because there is no available radiological data associated with Parcel C. The chemical characterization of soil and groundwater at Parcel C is presented in the Revised FS for Parcel C (SulTech, 2007).

#### **3.1 EXPOSURE SCENARIOS**

The 1997 redevelopment plan identifies planned reuses for the entire Parcel C area. Table 3-1 shows the radiologically-impacted areas of Parcel C, the planned reuse of those areas, and the associated exposure scenario.

The exposure scenario establishes the receptor parameters used in modeling for risk and personnel dose. The potential receptors considered for evaluation were selected to be consistent with the human health risk assessment provided in the Revised FS Report for Parcel C (SulTech, 2007) and are as follows:

- Resident (adult and child)
- Industrial worker (adult)
- Recreational user (adult and child)
- Construction worker (adult)

Historical Parcel C activities may have introduced radioactive contaminants to land areas and buildings. Contaminated media in the form of discrete radioactive sources as well as distributed contamination from leaks or spills of radioactive material are potentially present with Parcel C; however, there are no known impacted soil areas. Impacted land areas are limited to the Parcel C storm water and sanitary sewer system. Because these areas are limited in size and are not appropriate for inclusion in reuse scenarios because they represent such a small area they have been included with the impacted buildings. To provide information on potential risks for all potential reuses, a bounding resident scenario was modeled for both the Parcel C storm water and sanitary sewer systems and the impacted buildings.

#### **3.2 EXPOSURE PATHWAYS**

As discussed in the human health risk assessment in the Revised FS Report for Parcel C (SulTech, 2007), a complete exposure pathway consists of four elements:

- A source and mechanism of contaminant release.

- A retention or transport medium (or media in cases involving transfer of chemicals).
- A point of potential human contact with the contaminated medium (referred to as the exposure point).
- An exposure route (such as ingestion) at the contact point.

When any of these elements are missing (except in a case where the source itself is the point of exposure) the exposure pathway is considered incomplete. These elements are further explained in the Appendix A, Conceptual Site Model, Figure A.3-1. For example, if receptor contact with the source or transport medium does not occur, then the exposure pathway is incomplete and is not quantitatively evaluated for risk. Similarly, if human contact with an exposure medium is not possible, the exposure pathway is considered incomplete and is not evaluated.

For potentially contaminated structure surfaces, the exposure pathways are external radiation from contaminated surfaces and inhalation of re-suspended contaminated dust.

### **3.3 REMEDIATION GOALS**

Remediation goals (RGs) are selected to achieve the RAOs. Table 3-2 identifies the RG for each ROC. The soil RGs were derived from the EPA preliminary remediation goals based on an increased lifetime cancer risk range of  $10^{-6}$  to  $10^{-4}$  for future use scenarios except for  $^{226}\text{Ra}$ , which is based on an agreement with EPA (DON, 2006). The RGs for building and equipment surfaces were based on Atomic Energy Commission (AEC) Regulatory Guide 1.86 to meet the 25 millirem per year (mrem/y) dose limits of the NRC. The water RGs were derived from *Radionuclides Notice of Data Availability Technical Document*, (EPA, 2000) by comparing the limits from two criteria and using the most conservative limit.

#### **3.3.1 Radiological Constituents of Potential Concern**

The ROCs  $^{137}\text{Cs}$ ,  $^{60}\text{Co}$ ,  $^{232}\text{Th}$ ,  $^{239}\text{Pu}$ ,  $^{226}\text{Ra}$ , and  $^{90}\text{Sr}$  have been associated with Parcel C radiologically-impacted buildings, and  $^{226}\text{Ra}$ ,  $^{137}\text{Cs}$ , and  $^{90}\text{Sr}$  have been associated with the storm water and sanitary sewer system (NAVSEA, 2004). Specific isotopic information for these ROCs is shown in Table 2-2.

#### **3.3.2 Media of Concern**

The media of concern for Parcel C include the remaining impacted structures (buildings 203, 205 and its discharge channel, 211, 214, 224, 241, 253, 271, and 272), and the remediated storm water and sanitary sewer system.

### **3.4 RISK EVALUATION BY REDEVELOPMENT BLOCK**

The following sections summarize which impacted sites are in each redevelopment block and which computer program was used to assess the risk. Figure 2-3 shows the redevelopment

blocks, structures, and planned reuses. The potentially radiologically-impacted sites in Parcel C will be identified by redevelopment block as described in the following sections of this FS Addendum. Impacted storm water and sanitary sewers are present throughout Parcel C and will not be individually listed as belonging to a particular development block.

#### **3.4.1 Redevelopment Block 10**

Redevelopment Block 10 is just southwest from Block 11 and includes no radiologically-impacted buildings. Redevelopment Block 10 is identified for mixed use, and since it has no radiologically-impacted sites, it was not evaluated.

#### **3.4.2 Redevelopment Block 11**

Redevelopment Block 11, located in the northwest corner of Parcel C, includes no radiologically-impacted buildings. Redevelopment Block 11 is identified for mixed use, and since it has no impacted sites, it was not evaluated.

#### **3.4.3 Redevelopment Block 13**

Redevelopment Block 13 is south of Block 11 and southeast of Block 10 and includes no radiologically-impacted buildings. Redevelopment Block 13 is identified for mixed use, and since it has no radiologically-impacted sites, it was not evaluated.

#### **3.4.4 Redevelopment Block COS-1**

Redevelopment Block Parcel C Open Space (COS)-1 in the north-central portion of Parcel C includes no radiologically-impacted sites. Redevelopment Block COS-1 is identified for open space, and since it has no radiologically-impacted sites, it was not evaluated.

#### **3.4.5 Redevelopment Block 18**

Redevelopment Block 18 in the west-central Parcel C includes impacted Building 241 where a forge shop used firebrick containing naturally occurring radioactive material ( $^{232}\text{Th}$ ) and potassium nitrate ( $^{40}\text{K}$ ). Redevelopment Block 18 is identified for research and development reuse. The risk and dose were calculated using a Residual Radioactivity-Building (Model) (RESRAD-BUILD) residential exposure scenario.

#### **3.4.6 Redevelopment Block 20A**

Redevelopment Block 20A in west-central Parcel C does not include any impacted buildings. Redevelopment Block 20A is identified for research and development use, and since it has no radiologically-impacted sites, it was not evaluated.

### **3.4.7 Redevelopment Block 20B**

Redevelopment Block 20B in central Parcel C includes impacted Building 214. Activities inside Building 214 included NRDL Health Physics sample counting in Room 105. The ROCs for Building 214 are  $^{90}\text{Sr}$ ,  $^{137}\text{Cs}$ ,  $^{226}\text{Ra}$ , and  $^{239}\text{Pu}$  (NAVSEA, 2004). Redevelopment Block 20B is identified for educational/cultural use and was evaluated using a RESRAD-BUILD residential exposure scenario.

### **3.4.8 Redevelopment Block 22**

Redevelopment Block 22 in east-central Parcel C includes Building 205 and its discharge channel. Pumping Drydock 2 water that was potentially contaminated during ship decontamination resulted in the impacted classification for Building 205. ROCs for Building 205 included  $^{90}\text{Sr}$ ,  $^{137}\text{Cs}$ ,  $^{226}\text{Ra}$ , and  $^{239}\text{Pu}$  (NAVSEA, 2004). Redevelopment Block 22 is identified for educational/cultural use and was evaluated using a RESRAD-BUILD residential exposure scenario.

### **3.4.9 Redevelopment Block COS-2**

Redevelopment Block COS-2 in east-central Parcel C does not include any radiologically-impacted buildings. Redevelopment Block COS-2 is identified for open space use, and since it has no impacted sites, it was not evaluated.

### **3.4.10 Redevelopment Block 23**

Redevelopment Block 23 in southwestern Parcel C includes impacted Building 203, a power/steam plant, where contaminated fuel oil was burned in 1947. ROCs for Building 203 are  $^{90}\text{Sr}$ ,  $^{137}\text{Cs}$ ,  $^{226}\text{Ra}$ , and  $^{239}\text{Pu}$  (NAVSEA, 2004). Redevelopment Block 23 is identified for research and development use. Building 203 was evaluated using a RESRAD-BUILD residential exposure scenario.

### **3.4.11 Redevelopment Block 24**

Redevelopment Block 24 in south-central Parcel C includes impacted Buildings 271 and Building 272. Building 271 contained a paint shop annex where radium dial painting may have occurred. The ROC for Building 271 is  $^{226}\text{Ra}$  (NAVSEA, 2004). Building 272 included a machine shop where radiography sources possibly were used and/or stored. ROCs for Building 272 are  $^{60}\text{Co}$ ,  $^{137}\text{Cs}$ , and  $^{239}\text{Pu}$  (NAVSEA, 2004). Redevelopment Block 24 is identified for research and development use. Buildings 271 and 272 were evaluated using a RESRAD-BUILD residential exposure scenario.

### **3.4.12 Redevelopment Block 25**

Redevelopment Block 25 in east-central Parcel C includes impacted Buildings 211 (partial), 224, and 253. Building 211 included storage of low-level radioactive waste (LLRW) by a contractor.

ROCs for Building 211 are  $^{137}\text{Cs}$ ,  $^{226}\text{Ra}$ , and  $^{232}\text{Th}$  (NAVSEA, 2004). Building 224 served as a storage building for OPERATIONS CROSSROADS and GREENHOUSE fallout samples. ROCs for Building 224 are  $^{90}\text{Sr}$ ,  $^{137}\text{Cs}$ , and  $^{226}\text{Ra}$  (NAVSEA, 2004). Building 253 served as a radiography and instrument calibration shop, hosted storage of equipment from OPERATION CROSSROADS ships, and was a probable location for radium painting in the gauge shop. ROCs for Building 253 are  $^{90}\text{Sr}$ ,  $^{137}\text{Cs}$ ,  $^{226}\text{Ra}$ ,  $^{232}\text{Th}$ , and  $^{239}\text{Pu}$  (NAVSEA, 2004). Redevelopment Block 25 is identified for educational/cultural use. Buildings 211, 224, and 253 were evaluated using a RESRAD-BUILD residential exposure scenario.

### **3.4.13 Redevelopment Block COS-3**

Redevelopment Block COS-3 in eastern Parcel C includes a portion of Building 211. Building 211 included contractor LLRW storage. ROCs for Building 211 are  $^{137}\text{Cs}$ ,  $^{226}\text{Ra}$ , and  $^{232}\text{Th}$  (NAVSEA, 2004). Redevelopment Block COS-3 is identified for open space use. Building 211 was evaluated using a RESRAD-BUILD residential exposure scenario.

### **3.4.14 Redevelopment Block 26**

Redevelopment Block 26 in south-central Parcel C does not include any impacted buildings. Redevelopment Block 26 is identified for mixed use, and since it has no impacted sites, it was not evaluated.

### **3.4.15 Redevelopment Block CMI-1**

Redevelopment Block Parcel C Maritime/Industrial (CMI)-1 in southern Parcel C does not include any impacted buildings. Redevelopment Block CMI-1 is identified for maritime/industrial use, and since it has no impacted sites, it was not evaluated.

## **3.5 ANALYSIS OF RADIOLOGICAL DOSE AND RISK**

As described above, each impacted building was modeled using RESRAD-BUILD while the storm water and sanitary sewer system was modeled using RESRAD. Appendix A discusses the input parameters and modeling results for the radiological dose and risk for each impacted building and the sewer systems. The results were compared against the increased lifetime cancer risk range of  $10^{-6}$  to  $10^{-4}$  and the 25 mrem/yr dose to an individual limit. U.S. EPA does not believe this NRC regulation is protective of human health and the environment, and the HPS cleanup goals are more protective. This regulation is an ARAR only for radiologically-impacted sites that are undergoing TCRA and any additional remedial action required for those sites. It is not an ARAR for radiologically-impacted sites, buildings, or structures that will be transferred with engineering and institutional controls for radiological contaminants.

Lifetime cancer risk is a measurement of absolute risk and refers to the actual numeric chance or probability of developing cancer during a specified time period, in this case the lifespan of an

average individual. A lifetime cancer risk of  $10^{-6}$  implies that the probability of developing cancer is increased by one in 1,000,000. Likewise, a lifetime cancer risk of  $10^{-4}$  implies that the probability of developing cancer is increased by one in 10,000. Tables 3-3 and 3-4 summarize the modeling results. As shown in these tables, the modeled increased lifetime cancer risk is within the  $10^{-6}$  to  $10^{-4}$  risk range. The modeled dose values are all below 25 mrem/yr except for the modeled dose associated with Building 211, Building 241, and Building 253, which have modeled doses above 25 mrem/yr. The majority of the dose in these three buildings is due to the presence of  $^{232}\text{Th}$ . The actual residual  $^{232}\text{Th}$  in these three buildings after remediation will be less than the RGs and the associated dose will be less than 25 mrem/yr.

The modeling effort reported in Appendix A is based on the RGs. Currently, there is very little data available to accurately and appropriately assess current risk at each radiologically impacted site. A combination of scoping, remedial action, and final status surveys, based on MARSSIM methodology, will be conducted at each radiologically impacted building or site, as appropriate. This approach allows the results of field investigations to define and refine the direction of field work, guide cleanup decisions, and establish the basis for modeling risk after the results of final status surveys are known.

The modeling was performed with conservative input parameters to ensure that uncertainties would be minimized, and a separate set of models and results for uncertainty analysis would not be needed. Uncertainty analysis for the various modeling input parameters, as well as various assumptions required for the modeling, are discussed in Appendix A.

### **3.6 COMBINED CHEMICAL AND RADIOLOGICAL RISK**

Estimates of the lifetime risk of cancer to exposed individuals resulting from radiological and chemical risk assessments may be summed to determine the overall potential human health hazard associated with a site (Chapter 10, *Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual*, EPA/540/1-89/002, December, 1989).

To combine the chemical and radiological risks, the same approach used in the Revised FS Report for Parcel C (SulTech, 2007) to calculate chemical risk must be taken, namely, calculating total risk from ROCs including background and calculating incremental risk from the ROCs present at levels that do not include background. Of the ROCs for Parcel C, only  $^{226}\text{Ra}$  and  $^{232}\text{Th}$  are naturally occurring.  $^{137}\text{Cs}$  and  $^{90}\text{Sr}$  may be present in trace quantities because of fallout resulting from nuclear weapons testing. For purposes of radiological modeling, the background concentrations for the ROCs other than  $^{226}\text{Ra}$  are assumed to be essentially zero (i.e., zero picocuries per gram [pCi/g]). The  $^{226}\text{Ra}$  background concentration is assumed to be the measured background level of 0.485 pCi/g based on the background reference areas used to support the Parcel B storm water and sanitary sewer removal actions. This value has been rounded to 0.5 pCi/g for modeling purposes.

To estimate the total risk from impacted buildings and the storm water and sanitary sewer system, the background surface contamination for the ROCs is assumed to be zero disintegration per minute (dpm)/100 square centimeters (cm<sup>2</sup>) (0 dpm/100 cm<sup>2</sup>). This is a reasonable assumption since none of the ROCs are found in building materials except for <sup>226</sup>Ra, which can be found in building material made of earthen materials (i.e., cement, ceramic tiles). However, to simplify the modeling effort, the background concentration of <sup>226</sup>Ra in building materials also is assumed to be zero.

The combined total risk and incremental risk (chemical and radiological) were derived by reviewing the Revised FS Report for Parcel C (SulTech, 2007) and locating grid points in close proximity to each impacted building. The combined total radiological and chemical risk is shown on Table 3-5. The combined incremental risk (a combination of radiological and chemical incremental risks) is shown on Table 3-6. As shown in tables 3-5 and 3-6, the combined increased lifetime cancer risk is within the 10<sup>-6</sup> to 10<sup>-4</sup> risk range.

## **4.0 REMEDIAL ACTION OBJECTIVES, APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS, GENERAL RESPONSE ACTIONS, AND PROCESS OPTIONS**

This section identifies and screens potentially applicable alternatives for removing, stabilizing, containing, or reducing risk and exposure from the ROCs associated with the structures (buildings 203, 205 and its discharge channel, 211, 214, 224, 241, 253, 271, and 272) and storm water and sanitary sewer systems within Parcel C. The identification and screening of alternatives included:

- Development of RAOs for structures, and storm water and sanitary sewer systems for the ROCs identified in Section 3.3.1 above.
- Development of GRAs (e.g., containment and excavation) that may be taken to satisfy the RAOs.
- Delineation of target remediation sites to which GRAs might be applied.
- Identification and evaluation of technologies applicable to each GRA on the basis of their effectiveness to achieve the RAOs, technical and administrative implementability, and cost.

### **4.1 REMEDIAL ACTION OBJECTIVES**

RAOs are medium-specific goals for protecting human health and the environment. Each RAO should specify 1) the ROC, 2) the exposure route and receptors, and 3) an acceptable contaminant concentration or range of concentrations for each medium of concern (such as structures). RAOs include both an exposure pathway and a contaminant concentration in a given medium because protectiveness may be achieved in two ways: limiting or eliminating the exposure pathway, or reducing contaminant concentrations.

Typically, separate RAOs are developed for human health receptors and for ecological receptors. No ecological RAOs were developed because the majority of the Parcel C land area (greater than 90 percent) is paved, which precludes the presence of viable habitat (SulTech, 2007).

The RAOs for radiologically-impacted sites are as follows:

- Prevent ingestion, dermal contact, or inhalation of ROCs in concentrations that significantly exceed background concentrations.
- Assure that the total effective dose from radiologically-impacted sites to any member of the public does not exceed 25 mrem/y.
- Ensure that the increased lifetime cancer risk does not exceed the risk range of  $10^{-6}$  to  $10^{-4}$  for future use scenarios.

The NCP provides a range of cancer risks from  $10^{-6}$  to  $10^{-4}$  for the DON as lead agency along with its regulatory partners to use when making decisions on remedies for contaminated sites. Cancer risks less than  $10^{-6}$  (one in a million) are not considered to warrant a cleanup response. Cancer risks greater than  $10^{-4}$  (one in a ten thousand) excess cancer risk warrant action to reduce exposure. NCP §300.430(e)(2)(A) provides factors that must be considered when making decisions regarding RAOs and remedial alternatives in the context of the NCP Risk Management Range as follows:

- Preliminary remediation goals for carcinogens are set at a  $10^{-6}$  excess cancer risk as a point of departure, but may be revised to a different risk level within the acceptable risk range based on the consideration of appropriate factors including but not limited to exposure factors, uncertainty, and technical limitations (NCP preamble at 55 Fed. Reg. 8717, March 8, 1990).

There is a high level of confidence that the cancer risks are representative of the site conditions and the decisions at the  $10^{-4}$  risk level may be acceptable.

## **4.2 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS**

Section 121(d)(1) of CERCLA require that remedial actions attain (or the decision document must justify the waiver of) any ARAR that includes environmental regulations, standards, or criteria promulgated under federal or more stringent state laws. An ARAR may be either applicable or relevant and appropriate, but not both.

Applicable requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that specifically address the situation at a CERCLA site. The requirement is applicable if the jurisdictional prerequisites of the standard show a direct correspondence when objectively compared to the conditions at the site. An applicable federal requirement is an ARAR. An applicable state requirement is an ARAR only if it is more stringent than federal ARARs.

If the requirement is not legally applicable, then the requirement is evaluated to determine whether it is relevant and appropriate. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that, while not applicable, address problems or situations similar to the circumstances of the proposed response action and are well suited to the conditions of the site. A requirement must be determined to be both relevant and appropriate to be considered an ARAR.

Section 121(e) of CERCLA exempts any response action conducted entirely on site from having to obtain a federal, state, or local permit when the action is carried out in compliance with Section 121. In addition, on-site actions need only comply with the substantive requirements of ARARs, and not with the corresponding administrative procedures, such as administrative

reviews and record-keeping requirements. Off-site actions must comply with all legally applicable requirements, both substantive and administrative.

The identification of ARARs is based on site-specific factors, including potential remedial actions, chemicals and compounds found at the site, physical characteristics of the site, and the location of the site. ARARs are usually divided into three categories: chemical-specific, location-specific, and action-specific.

As the lead federal agency, the DON has primary responsibility for identification of potential ARARs for HPS Parcel C. The final identification of ARARs will be in a final Record of Decision (ROD). EPA guidance recommends that the lead federal agency consult with the state when identifying potential state ARARs for remedial actions (EPA, 1988). In October 2003, the DON requested that the state identify potential ARARs. On December 24, 2003, Department of Toxic Substances Control (DTSC) responded and identified potential state ARARs. This response also included potential state ARARs identified by the Department of Fish and Game and the California Department of Public Health (CDPH). The Water Board also submitted a response that identified potential state ARARs for remediation of soil and groundwater. To qualify as a state ARAR under CERCLA and the NCP, a state requirement must be 1) a standard, requirement, criterion, or limitation under a state environmental or facility siting law; 2) promulgated (of general applicability and legally enforceable); 3) substantive (not procedural or administrative); 4) more stringent than the federal requirement; 5) identified by the state in a timely manner; and 6) consistently applied. Requirements identified by these state agencies that the DON identified as potential ARARs are presented in Appendix C.

The sections below summarize the potential federal and State of California radiological ARARs. The non-radiological ARARs are discussed in Section 4.2 of the Revised FS Report for Parcel C (SulTech, 2007).

#### **4.2.1 Potential Chemical-specific ARARs**

Chemical-specific ARARs are health- or risk-based numerical values or methodologies that, when applied to site-specific conditions, result in the establishment of numerical cleanup values. Chemical-specific ARARs for soil and structures are described in Table 4-1 and summarized below.

##### **4.2.1.1 Soil**

Section 4.2.1.1 of the Revised FS Report for Parcel C discusses potential chemical-specific ARARs for soil. Parcel C does not contain radiologically-impacted soil except possibly in the vicinity of the remediated storm water and sanitary sewer lines. Because the land areas associated with the remediated sewer systems is very small, they have been included with the impacted buildings for the purposes of this study. No federal requirements for radioactive material are potentially applicable. However, the substantive provisions of the following

potential radiation-specific requirements were identified as potentially relevant and appropriate for the remediation of soil and solid waste containing radioactive material at the site:

- Standards for Protection Against Radiation (10 CFR § 20.1402).
- Standards for Cleaning of Land and Building Contaminated with Residual Radioactive Materials from Inactive Uranium Processing Site (40 CFR 192.12[a]).

U.S. EPA does not believe 10 CFR § 20.1402 is protective of human health and the environment, and the HPS cleanup goals are more protective. This regulation is an ARAR only for radiologically-impacted sites that are undergoing TCRAs and any additional remedial action required for those sites. It is not an ARAR for radiologically-impacted sites, buildings, or structures that will be transferred with engineering and institutional controls for radiological contaminants.

California state requirements (California Code of Regulations [Cal.Code Regs.] title 17, § 30253) are not more stringent than federal ARARs in 10 CFR 20. Therefore, the state requirements are not potential ARARs.

#### **4.2.1.2 Groundwater**

Section 4.2.1.2 of the Revised FS Report for Parcel C (SulTech, 2007) discusses potential federal and state chemical-specific ARARs for groundwater. The discussion includes the federal maximum contaminant levels (MCLs) promulgated by EPA under the Safe Drinking Water Act. This addendum specifically includes the 40 CFR 141.66 MCLs for radionuclides.

#### **4.2.1.3 Surface Water**

Section 4.2.1.3 of the Revised FS Report for Parcel C discusses potential ARARs associated with surface waters. No additional ARARs for surface waters are included in this addendum.

#### **4.2.1.4 Structures**

Parcel C has structures (i.e., buildings) that are radiologically-impacted; therefore ARARs are included for radiologically-impacted structures. No federal requirements for radioactive material are potentially applicable. However, the substantive provisions of the following potential radiation-specific requirements were identified as potentially relevant and appropriate for the remediation of radiologically-impacted structures:

- Standards for Protection Against Radiation (10 CFR 20.1402).
- Standards for Cleanup of Land and Buildings Contaminated with Residual Radioactive Materials from Inactive Uranium Processing Sites 40 CFR 192.12(a).

U.S. EPA does not believe 10 CFR § 20.1402 is protective of human health and the environment, and the HPS cleanup goals are more protective. This regulation is an ARAR only for radiologically-impacted sites that are undergoing TCRA and any additional remedial action required for those sites. It is not an ARAR for radiologically-impacted sites, buildings, or structures that will be transferred with engineering and institutional controls for radiological contaminants.

#### **4.2.2 Potential Location-specific ARARs**

Section 4.2.2 of the Revised FS Report for Parcel C discusses potential federal location-specific ARARs. No additional location-specific ARARs are included in this addendum.

#### **4.2.3 Potential Action-specific ARARs**

Action-specific ARARs are technology- or activity-based requirements or limitations for remedial activities. These requirements are triggered by the specific remedial actions conducted at the site and indicate how a selected remedial alternative should be achieved. The DON has identified potential action-specific ARARs for the alternatives evaluated in this addendum. These action-specific ARARs supplement the action-specific ARARs discussed in Section 4.2.3 of the Revised FS Report for Parcel C.

##### **4.2.3.1 Soil Alternatives**

Remedial alternatives evaluated for Parcel C soil include the following types of actions for radioactive material remediation, as discussed in more detail in Section 5.0: 1) no action; 2) institutional controls (ICs) and maintained landscaping; 3) excavation (removal of the chemicals of concern), disposal, ICs, and maintained landscaping; 4) covering and ICs; and 5) excavation, disposal, covers, soil vapor extraction, and ICs. As there are no known impacted land areas in Parcel C (with the possible exception of residual radiation associated with the remediated storm water and sanitary sewer system that has been included with the impacted buildings), there are no potential action-specific radiological ARARs for soil.

#### **Maintained Landscaping**

The DON has not identified any federal ARARs for maintained landscaping. The DON has identified as a potential state ARAR Maintained Landscaping in Section 4.2.3.1 of the Revised FS Report for Parcel C (SulTech, 2007).

#### **Excavation**

The DON has identified that the substantive provisions of the federal and state requirements as potential ARARs for excavated soil and other wastes generated during implementation of the alternatives as the same for chemicals and radionuclides described in Section 4.2.3.1 of the Revised FS Report for Parcel C (SulTech, 2007).

## **Covers for the Soil**

The DON has identified that the substantive provisions of the federal and state requirements as potential ARARs for constructing the redevelopment block covers during implementation of the alternatives as the same for chemical and radionuclides. The ARARs are found in Section 4.2.3.1 of the Revised FS Report for Parcel C (SulTech, 2007).

### **4.2.3.2 Structures**

Remedial alternatives evaluated for Parcel C radiologically-impacted structures (buildings and the storm water and sanitary sewer system) include the following: 1) no action; 2) survey, decontamination, disposal, and release following the remediation goals in Table 3-2; 3) containment; and, 4) ICs. The substantive provisions of the following potential radiation-specific requirements were identified as potentially relevant and appropriate for radiologically-impacted structures:

- Radiation Dose Limits for Individual Members of the Public (10 CFR 20.1301).
- Standards for Protection Against Radiation (10 CFR 20.1402).

U.S. EPA does not believe 10 CFR § 20.1402 is protective of human health and the environment, and the HPS cleanup goals are more protective. This regulation is an ARAR only for radiologically-impacted sites that are undergoing TCRA and any additional remedial action required for those sites. It is not an ARAR for radiologically-impacted sites, buildings, or structures that will be transferred with engineering and institutional controls for radiological contaminants.

## **4.3 GENERAL RESPONSE ACTIONS AND PROCESS OPTIONS ANALYSES**

GRAs describe those actions that will satisfy RAOs for both groundwater and structures. Unlike non-radioactive hazardous substances, which have the ability to be altered by physical, chemical, or biological processes that can reduce or destroy the hazard itself, radioactive substances generally cannot be similarly altered or destroyed. Since destruction of radioactivity is not an option, response actions at radioactively contaminated sites use the concepts of “Time, Distance, and Shielding”. Time allows the natural decay of the radionuclide to take place, resulting in reduction in risk to human health and the environment. Distance and shielding from the radioactive material rapidly reduce the risk from radiation by reduction of the intensity of the imparted energy (EPA, 1996). A process option is defined as a specific technology used to carry out a general response action. The following GRAs have been identified for Parcel C:

**Soil** (Note that soil areas are not considered radiologically-impacted within Parcel C. There is a possibility that some impacted soil associated with the removal of the storm water and sanitary sewer system may remain. However, this soil will be considered part of the debris to be removed with the storm water and sanitary sewer and is not included in this evaluation).

### **Groundwater**

- *No Action:* Under this GRA, no further response action will be conducted.
- *Institutional Controls:* ICs include non-engineered methods such as administrative and/or legal controls that minimize the potential for human exposure to contaminated material by limiting land or resource use and that protect the integrity of remedial action.
- *Long-term Monitoring:* This GRA includes groundwater monitoring for ROCs to confirm site conditions and ensure that, over time, the potential exposure pathway remains incomplete. This long term monitoring augments the groundwater monitoring discussed in Part 4.3.2.2 of the Revised FS Report for Parcel C associated with chemical contaminants of concern.
- *VOC Treatment with reduced monitoring:* This GRA includes treatment for volatile organic compounds (VOCs) and metals with reduced monitoring as described in Part 4.3.2.2 of the Revised FS Report for Parcel C associated with chemical contaminants of concern. The radiological status of the Parcel C groundwater is unknown.

**Structures** (including buildings and the remediated storm water and sanitary sewer system).

- *No Action:* Under this GRA, no further response action will be conducted.
- *Survey of Impacted Sites:* A radiological survey of all impacted sites and structures will be performed according to the guidance provided in the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) (NUREG-1575; Department of Defense [DOD] et al., 2000) to determine actual site conditions and provide information to guide decontamination and disposal.
- *Scabbling and Demolition:* This includes removal of thin layers of contaminated building material to remove the surface contamination, sinks, floor drains and associated piping, and/or complete demolition and removal of contaminated structures. All removal actions will be guided by radiological survey data, and followed up with additional progress of work surveys to ensure removal of the ROCs.
- *Institutional Controls:* These include non-engineered methods such as administrative and/or legal controls that minimize the potential for human exposure to contaminated material by limiting land or resource use and that protect the integrity of remedial action.

## **4.4 ANALYSIS OF GENERAL RESPONSE ACTIONS AND PROCESS OPTIONS**

General response actions selected for this Addendum underwent initial screening and analysis. During the initial screening, the range of technology types and process options were evaluated in

terms of technical implementation, site conditions, waste characteristics, contaminant properties, and the ability to meet NCP requirements and RAOs. The results of the initial screening are summarized in Table 4-2. The GRAs and process options carried forward from the initial screening were then analyzed in terms of effectiveness, implementability, and cost. The summary of this screening and analysis of GRAs and process options for soil, groundwater, and structures is presented in Table 4-3.

The implementability evaluation focused on technical, as well as institutional aspects of implementability, such as the ability to obtain necessary permits and approvals, availability of equipment and skilled workers, extensiveness of knowledge required to implement the process option, and the need for treatment or disposal of process waste.

The cost evaluation included semi-quantitative analysis based on engineering judgment and the unit costs given in the Revised FS Report for Parcel C (SulTech, 2007).

#### **4.4.1 Evaluation of Applicable Soil Process Options**

Potentially applicable GRAs identified for soil at Parcel C consist of 1) no action, 2) ICs, 3) removal, and 4) containment. The initial screening of process options for the remedial technology types for these GRAs is shown in Table 4-2. This table presents the various technology types, process options, and results of the screening analysis for each GRA for soil and structures.

Those process options retained during the initial screening were evaluated for effectiveness, implementability, and cost, and are discussed in this section. Table 4-3 summarizes the results for this evaluation.

##### **4.4.1.1 No Action**

The NCP requires that the no-action alternative be carried through the detailed analysis of alternatives. Under the no-action response, no remedial action is taken. Soil would be left as is without implementing any ICs, containment, removal, treatment, or other mitigating actions. Because soil at Parcel C is not known to contain any ROCs and poses no known radiological risk to human health and the environment under the anticipated future land-use scenario, the no-action response could be considered an acceptable alternative that meets the requirements of CERCLA. No cost is associated with this option because no action is taken. The no-action option will be retained for further evaluation as a remedial alternative for comparison purposes, as required under the NCP.

#### **4.4.1.2 Institutional Controls**

There are no land use restriction requirements or ICs associated with Parcel C soil, as it is already considered radiologically non-impacted. Those generally applicable land-use restrictions and ICs specified in Part 4.3.2.1 of the Revised FS Report for Parcel C associated with chemical contaminants of concern will be applicable.

#### **4.4.1.3 Removal**

As part of a separate approach, the DON is remediating radiologically-impacted storm water and sanitary sewer systems at HPS. Excavation and removal of soil from Parcel C other than that found to be above the RGs during the Parcel C storm water and sanitary sewer line removal action is not considered a radiological alternative because there are no known ROCs associated with the Parcel C soil areas. Those applicable excavation and removal processes specified in Part 4.3.2.1 of the Revised FS Report for Parcel C associated with chemical contaminants of concern will be applicable.

#### **4.4.1.4 Containment**

Containment or covering of soil is not considered a radiological alternative because Parcel C soil is not radiologically-impacted. Those applicable containment and soil covers specified in Part 4.3.2.1 of the Revised FS Report for Parcel C associated with chemical contaminants of concern will be applicable.

### **4.4.2 Evaluation of Applicable Groundwater Process Options**

Potentially applicable GRAs identified for groundwater at Parcel C consist of 1) no action, 2) ICs, 3) long-term monitoring and 4) treatment for volatile organic compounds (VOCs) and metals with reduced monitoring. The initial screening of process options for the remedial technology types for these groundwater GRAs is shown in Table 4-2. This table presents the various technology types, process options, and results of the screening analysis for each groundwater process option. Treatment, removal, and containment of groundwater were not retained after the initial screening based on difficulty of implementation and poor effectiveness. A summary of the selected GRAs is shown in Table 4-3.

#### **4.4.2.1 No Action**

The NCP requires that the no-action alternative be carried through the detailed analysis of alternatives. Under the no-action response, no remedial action is taken. The no-action response would not be an effective alternative that meets the requirements of CERCLA. No cost is associated with this option because no action is taken. The no-action option will be retained for further evaluation as a remedial alternative for comparison only, as required under the NCP.

#### **4.4.2.2 Institutional Controls**

As previously discussed in Section 4.4.1.2, ICs will be used to implement land use and access restrictions to limit the exposure of future landowner(s) and/or user(s) of the property to hazardous substances and to maintain the integrity of the remedial action until remediation is complete and remediation goals have been achieved. Section 4.3.2.2 of the Revised FS Report for Parcel C provides a discussion of ICs and land use restrictions relative to groundwater.

#### **4.4.2.3 Groundwater Monitoring**

Groundwater monitoring for the ROCs will be used to confirm site conditions and ensure that, over time, the potential exposure pathway remains incomplete.

#### **4.4.2.4 VOC Treatment with Reduced Monitoring**

This GRA includes treatment for volatile organic compounds (VOCs) and metals with reduced monitoring as described in Part 4.3.2.2 of the Revised FS Report for Parcel C associated with chemical contaminants of concern. The radiological status of the Parcel C groundwater is unknown. This alternative is not applicable to the radiological condition of the Parcel C groundwater, but instead applies to the chemical condition.

### **4.4.3 Evaluation of Applicable Structure Process Options**

Potentially applicable GRAs identified for impacted structures at Parcel C consist of 1) no action; 2) survey, decontamination, and release to meet the remediation goals listed in Table 3-2, and 3) scabbling and ICs. The initial screening of process options for the remedial technology types for these GRAs is shown in Table 4-2. A summary of the selected GRAs is shown in Table 4-3.

#### **4.4.3.1 No Action**

The NCP requires that the no-action alternative be carried through the detailed analysis of alternatives. Under the no-action response, no remedial action is taken. Impacted structures would be left as is without implementing any survey or decontamination. Because impacted structures at Parcel C may pose a risk to human health and the environment under the anticipated future land-use scenario, the no-action response would not be an effective alternative that meets the requirements of CERCLA. No cost is associated with this option because no action is taken. The no-action option will be retained for further evaluation as a remedial alternative for comparison only, as required under the NCP.

#### **4.4.3.2 Survey of Impacted Sites**

A Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) (NUREG-1575; Department of Defense [DOD] et al., 2000) radiological survey would be performed on all impacted sites. The impacted sites would be divided into survey units and any ROCs at or above Table 3-2 remediation goals would be remediated.

#### **4.4.3.3 Scabbling and Demolition**

This could include decontamination or removal of building material to remove the surface contamination and/or demolition of impacted sinks, floor drains and piping or other media within the structures, removal of ventilation components, and/or complete demolition and removal of contaminated structures. Limited storm drain and sanitary sewer piping and system components may be left in place permanently or be addressed through task-specific work plans. Piping under the footprint of radiologically-impacted buildings and outdoor areas will be evaluated as part of the characterization of each building/area. Piping laterals originating at non-radiologically impacted buildings initially will only be removed within the first 10 feet of their union with a main trunk line. If no radiological contamination is present in this segment of the line, then the exposed ends of the lateral will be capped or plugged and the remaining portions left in place. If evidence of radiological contamination is encountered, the remaining lateral will be removed in 10-foot sections until the line has been determined to be free of radioactive contamination or to the face of an existing build, whichever comes first. All removal actions will be guided by radiological survey data and followed up with additional progress of work surveys to ensure any ROCs at or above Table 3-2 remediation goals would be remediated.

#### **4.4.3.4 Institutional Controls**

The following land use restriction requirements shall apply in the Area Requiring Institutional Controls (ARIC) for potential radionuclides located in the deep pump shaft under Building 205 (see Figure 2-3) in addition to those generally applicable land use restrictions specified in Section 4.4.1.2 previously discussed. At the time of transfer, the areas that require this restriction will be surveyed to define the legal metes and bounds for inclusion in the property transfer documents.

The Parcel C Risk Management Plan (RMP) shall address any necessary additional soil and radiological management issues within the ARIC for potential radionuclides designated in Figure 2-3 and defined in the property transfer documents. For activities disturbed the deep pump shaft under Building 205, the proposed activity will be required to be described in a work plan that will include but not be limited to a radiological work plan, sampling and analysis requirements, and a plan for off-site disposal of any removed radionuclides by the transferee in accordance with federal and state law. This work plan must be submitted to and approved by one or more Federal Facility Agreement (FFA) Signatories in accordance with procedures (including dispute resolution procedures) and timeframes that will be set forth in the RMP. The integrity of the

cover/cap must be restored upon completion of excavation as provided in the Parcel C RMP and approved by the FFA Signatories. A completion report describing the details of the implementation of the work plan, the sampling and analysis, the off-site disposal and the restoration of the cover/cap must be submitted to and approved by one or more Federal Facility Agreement (FFA) Signatories in accordance with procedures (including dispute resolution procedures) and timeframes that will be set forth in the RMP.

## **5.0 DEVELOPMENT AND DESCRIPTION OF REMEDIAL ALTERNATIVES**

The remedial action alternatives for ROCs at Parcel C were developed by combining different technologies and process options corresponding to different GRAs. The target remediation areas were also considered while developing the alternatives. This process ensured the development of a range of alternatives from those involving removal of radiologically contaminated soil, groundwater, or structures posing unacceptable risk to human health to those involving little or no treatment but providing protection to human health by minimizing exposure to the remaining ROCs of Parcel C.

### **5.1 DEVELOPMENT OF REMEDIAL ALTERNATIVES**

Process options were developed and screened as described in Section 4.0. The retained process options were combined into remedial alternatives to meet RAOs and to satisfy ARARs. The remedial alternatives were derived using experience and engineering judgment to formulate process options into the most plausible site-specific remedial actions.

The DON's strategy for groundwater remedial alternatives is to eliminate complete exposure pathways to the potential receptors and to monitor the known affected areas while the aquifer recovers. Various ICs are included in the remedial alternatives for groundwater to assure that the RAOs and ARARs are satisfied.

The DON's strategy for remedial alternatives for radiologically-impacted buildings is to eliminate complete exposure pathways to the potential receptors to assure that the RAOs and ARARs are satisfied. In certain chemically-driven remedial alternatives, soil covers will eliminate exposure to potential unacceptable risk. Covers will use existing materials (rehabilitated as necessary) and newly installed materials to eliminate exposure. Various ICs are also integrated with each alternative to assure that the RAOs and ARARs are satisfied.

Groundwater remedial alternatives include five-year reviews of ICs to confirm that the remedies are continuing to protect human health and the environment. Costs for five-year reviews, as well as other long-term activities, are included in the cost estimates for all alternatives.

The alternatives developed for further analysis for soil, groundwater, and buildings are presented in the following sections.

#### **5.1.1 Alternatives Developed for Soil**

Section 5.2 of the Revised FS Report for Parcel C (SulTech, 2007) discusses the alternatives developed for soils summarized below.

### **Alternative S-1: No Action**

For this alternative, no remedial action would be taken. Soil would be left in place without implementing any response actions. The no-action response is retained throughout the evaluation process as required by the NCP to provide a baseline for comparison with other alternatives.

### **Alternative S-2: Institutional Controls and Maintained Landscaping**

Alternative S-2 consists of ICs and maintained landscaping that, together, will meet all ARARs and RAOs. The ICs include access restrictions and covenants to restrict use of property that will be implemented parcel-wide for all of the redevelopment blocks. The maintained landscaping would prevent potential exposure to asbestos that may be present in surface soil and transported by wind erosion that would not be addressed by ICs alone (SulTech, 2007).

### **Alternative S-3: Excavation, Disposal, Institutional Controls, and Maintained Landscaping**

Alternative S-3 consists of limited soil excavation of chemicals of concern, off-site disposal of chemicals of concern, ICs, and maintained landscaping as described in the Revised FS Report for Parcel C (SulTech, 2007).

### **Alternative S-4: Covers and Institutional Controls**

Alternative S-4 consists of covers to ensure that the exposure pathway to soil contaminants is blocked and ICs similar to Alternatives S-2 and S-3.

### **Alternative S-5: Excavation, Disposal, Covers, Soil Vapor Extraction, and Institutional Controls**

Alternative S-5 consists of a combination of soil excavation (S-3), disposal (S-3), covers (S-4), soil vapor extraction, and ICs (S-2 and S-3) to ensure that the exposure pathways to soil contamination are blocked. In addition, extraction of VOCs will provide further remediation.

## **5.1.2 Alternatives Developed for Groundwater**

Section 5.3 of the Revised FS Report for Parcel C discusses the alternatives developed for groundwater summarized below (SulTech, 2007).

A Parcel C ROC groundwater monitoring program currently does not exist nor has the groundwater been completely characterized. The following groundwater alternatives include ROC sampling and analysis whenever a sample is collected for chemicals of concern in remedial units (RU)-C1, RU-C2, RU-C4, and non-plume areas. Appropriate alternatives will be evaluated upon review of groundwater data.

### **Alternative GW-1: No Action**

For this alternative, no remedial action will be taken for groundwater. Groundwater conditions will be left as is, without implementing any response actions. The no-action response is retained throughout the evaluation process as required by the NCP to provide a baseline for comparison with other alternatives.

### **Alternative GW-2: Institutional Controls and Long-Term Groundwater Monitoring**

Alternative GW-2 consists of groundwater monitoring and ICs. This alternative was developed as a method for monitoring contaminants present at low concentrations in groundwater.

Additionally, groundwater monitoring would be used to confirm site conditions and ensure that, over time, the potential exposure pathways remain incomplete. ICs are also included in this alternative to effectively manage risk by preventing exposure and use of the groundwater.

Groundwater monitoring in the wells identified in the Revised FS Report for Parcel C (SulTech, 2007) for the ROCs would be used to confirm site conditions and ensure that, over time, the potential exposure pathway remains incomplete. Monitoring would occur in the 132 wells in and proposed for RU-C1, RU-C2, RU-C4, and non-plume areas. These wells are in or near radiologically-impacted buildings.

### **Alternative GW-3A: In-Situ Bioremediation, Long-Term Groundwater Monitoring and Institutional Controls**

Alternative GW-3A consists of in-situ treatment of the contaminant plumes in addition to groundwater monitoring and ICs, similar to Alternative GW-2. Groundwater monitoring for the ROCs will be used to confirm site conditions and ensure that, over time, the potential exposure pathway remains incomplete. Monitoring would occur in the 132 wells in and proposed for RU-C1, RU-C2, RU-C4, and non-plume areas.

### **Alternative GW-3B: In-Situ Zero-Valent Iron Reduction, Bioremediation, Long-Term Groundwater Monitoring, and Institutional Controls**

Alternative GW-3B consists of a zero valent iron slurry as an additive to create a chemically reducing environment in the aquifer that mineralizes chlorinated chemicals similar to the bioremediation reaction and followed by anaerobic and aerobic bioremediation. This alternative would reduce the required time to meet the groundwater remedial action objectives, and as a result, the length of groundwater monitoring and possibly the time required for ICs.

Groundwater monitoring for the ROCs would be used to confirm site conditions and ensure that, over time, the potential exposure pathway remains incomplete. Monitoring would occur in the 132 wells in and proposed for RU-C1, RU-C2, RU-C4, and non-plume areas.

### **5.1.3 Alternatives Developed For Radiologically Impacted Sites**

The following alternatives were developed for radiologically-impacted buildings and the storm water and sanitary sewer system in Parcel C.

#### **Alternative R-1: No Action**

No remedial action will be taken for this alternative. Parcel C building and site conditions will be left as is, without implementing any response actions. The no-action response is retained through the evaluation process as required by the NCP to provide a baseline for comparison with other alternatives.

#### **Alternative R-2: Survey, Decontamination, Disposal, Release, and Institutional Controls**

Alternative R-2 consists of decontamination of radiologically-impacted buildings and dismantlement if necessary except for Building 205. Institutional controls only will apply to Building 205. The radiological wastes would be packaged and sent off-site to a licensed disposal facility. The effort includes survey and decontamination of buildings, trenches resulting from sewer and storm sewer removal, and storm water and sanitary sewer piping and associated soils to meet the remediation goals.

#### **Alternative R-3: Survey, Decontamination, Disposal, Release, Close In-Place, and Institutional Controls**

Alternative R-3 consists of decontamination of impacted buildings, dismantlement if necessary; survey of buildings, trenches resulting from sewer and storm line removal, and storm drain and sanitary sewer piping to meet the RAOs; and use of ICs. Under this alternative the above-grade portions of Building 205, the discharge channel, and first 10 feet of the Building 205 Shaft would be surveyed to verify that no residual radioactivity is present above the RGs. The shaft in Building 205 below 10 feet would not be remediated. The shaft below 10 feet and connecting piping would be closed in-place with backfilled stone and a concrete cap. ICs would be utilized to prevent exposure to potentially unacceptable risk by the ROCs left in place.

## 6.0 DETAILED ANALYSIS OF ALTERNATIVES

This section provides a detailed analysis of each remedial alternative developed in Section 5.0. This information will be used to help select a final remedy for Parcel C. The alternatives are evaluated using criteria based on the statutory requirements of CERCLA as amended by the Superfund Amendments and Reauthorization Act, Section 121; the NCP; and *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (EPA, 1988).

The NCP specifies nine criteria to be used in the comparative analysis. The first two are threshold criteria that must be satisfied for a remedy to be eligible for selection; the next five are balancing criteria used to evaluate the comparative advantages and disadvantages of the remedies; and the final two are modifying criteria generally taken into account after agency and public comments are received on the proposed plan. The nine criteria include:

**Overall protection of human health and the environment:** This criterion describes how each alternative, as a whole, protects human health and the environment and indicates how each hazardous substance source is to be eliminated, reduced, or controlled.

**Compliance with ARARs:** This criterion evaluates each alternative's compliance with ARARs, or, if an ARAR waiver is required, how the waiver is justified. ARARs consider location-specific, chemical-specific, and cleanup action-specific concerns.

**Long-term effectiveness and permanence:** This criterion evaluates the effectiveness of each alternative in protecting human health and the environment after the remedial action is complete. Factors considered include magnitude of residual risks and adequacy and reliability of release controls.

**Reduction of toxicity, mobility, or volume through treatment:** This criterion evaluates the anticipated capability of each alternative's specific treatment technology to reduce the toxicity, mobility, or volume of hazardous substances.

**Short-term effectiveness:** This criterion addresses the effectiveness of each alternative in protecting human health and the environment during the construction and implementation phase. Factors considered include:

- Exposure of the community during implementation.
- Exposure of the workers during construction.
- Environmental impacts.
- Time required to complete the remedial action and achieve RAOs.

**Implementability:** This criterion addresses the technical and administrative feasibility of implementing an alternative and the availability of the required services and materials during its implementation. Factors considered include:

- Ability to construct the technology.
- Reliability of the technology.
- Monitoring considerations.
- Availability of equipment and specialists.

**Cost:** This criterion evaluates the capital and operation and maintenance (O&M) costs for each alternative. Capital and O&M cost estimates are order-of-magnitude level estimates and have an expected accuracy of minus 30 to plus 50 percent (EPA, 2000).

**Community Acceptance:** This criterion evaluates issues and concerns the public may have about each alternative. This criterion will be assessed after community comments have been received on the Revised FS Report for Parcel C, this addendum, and the proposed plan.

**Regulatory Agency Acceptance:** This criterion evaluates technical and administrative issues and concerns the regulatory agencies may have about each alternative. This criterion will be assessed after agency comments are received on the Revised FS Report for Parcel C, this addendum, and the proposed plan.

In the following sections each remedial alternative is evaluated to the two threshold and five balancing NCP criteria, and subsequently compared with other alternatives to assess the relative performance with respect to these criteria.

## **6.1 INDIVIDUAL ANALYSIS OF SOIL REMEDIAL ALTERNATIVES**

A discussion of individual analyses of each of the soil alternatives with respect to the evaluation criteria is provided in Section 6.1 of the Revised FS Report for Parcel C. This Addendum adds no radiological monitoring of soil removed per the soils (S) alternatives as defined for chemical remediation in the Revised FS Report for Parcel C. Remedial alternatives are discussed in Section 6.5 below.

## **6.2 COMPARISON OF SOIL REMEDIAL ALTERNATIVES**

A discussion comparing the five soil remedial alternatives is provided in Section 6.2 of the Revised FS Report for Parcel C (SulTech, 2007). Comparison of remedial alternatives that address radiologically-impacted sites in Parcel C is discussed in Section 6.6 below.

### **6.3 INDIVIDUAL ANALYSIS OF GROUNDWATER REMEDIAL ALTERNATIVES**

A discussion of individual analyses of groundwater alternatives with respect to the evaluation criteria is provided in Section 6.3 of the Revised FS Report for Parcel C (SulTech, 2007). For this Addendum, Alternatives GW-2, GW-3A, and GW-3B include monitoring for radionuclides because there is no available groundwater data associated with radionuclides for Parcel C. The inclusion of monitoring for radionuclides does not change the conclusions presented in Section 6.3 of the Revised FS Report for Parcel C. Therefore, no additional discussion of the groundwater alternatives is presented in this addendum. The groundwater monitoring will provide data to propose any remedial alternatives that may be necessary pertaining to potential risk from ROCs in the groundwater.

### **6.4 COMPARISON OF GROUNDWATER REMEDIAL ALTERNATIVES**

A discussion comparing the groundwater alternatives is provided in Section 6.4 of the Revised FS Report for Parcel C. Both alternatives include monitoring for radionuclides. The inclusion of monitoring for radionuclides does not change the conclusions presented in Section 6.4 of the Revised FS Report for Parcel C. Therefore, no additional discussion of the groundwater alternatives is presented in this addendum.

### **6.5 INDIVIDUAL ANALYSIS OF RADIOLOGICALLY-IMPACTED SITES REMEDIAL ALTERNATIVES**

A discussion of individual analyses of each of the radiologically-impacted sites' (buildings and the storm water and sanitary sewer system) remedial alternatives with respect to the evaluation criteria described in Section 6.0 is described in the following sections. A summary is presented in Table 6-1.

#### **6.5.1 Individual Analysis of Alternative R-1**

Under Alternative R-1, no remedial action would be taken. Impacted sites would be left as is without implementing any ICs, containment, removal, or other mitigating actions. The no-action response is retained through the evaluation process as required by the NCP to provide a baseline for comparison with other alternatives. As discussed below, the overall rating of Alternative R-1 is not acceptable.

##### **6.5.1.1 Overall Protection of Human Health and the Environment: Alternative R-1**

ROCs at Parcel C pose unacceptable risks to human health under the proposed planned reuse for several redevelopment blocks. Alternative R-1 does not address these risks; therefore, the rating for Alternative R-1 for overall protection of human health and the environment is not protective.

### **6.5.1.2 Compliance with ARARs: Alternative R-1**

There is no need to identify ARARs for the no-action alternative because ARARs apply to “any removal or remedial action conducted entirely on-site” and “no action” is not a removal or remedial action. CERCLA § 121 (42 United States Code § 9621) cleanup standards for selection of a Superfund remedy, including the requirement to meet ARARs, are not triggered by the no-action alternative (EPA, 1988). Therefore, a discussion of compliance with ARARs is not appropriate for this alternative.

### **6.5.1.3 Long-term Effectiveness and Permanence: Alternative R-1**

The factors evaluated under long-term effectiveness and permanence included the magnitude of residual risks and the adequacy and reliability of the controls. Under the no-action alternative, residual contamination above remediation goals have not been addressed. No controls to prevent exposure and no long-term management measures such as ICs are implemented. Based on this evaluation, the overall rating for Alternative R-1 for long-term effectiveness and permanence is not acceptable.

### **6.5.1.4 Reduction of Toxicity, Mobility, or Volume through Treatment: Alternative R-1**

Alternative R-1 does not include treatment that would result in the destruction, transformation, or irreversible reduction in contaminant mobility. Therefore, the overall rating for Alternative R-1 for the reduction of toxicity, mobility, and volume through treatment is poor.

### **6.5.1.5 Short-term Effectiveness: Alternative R-1**

Four factors are considered as part of the short-term effectiveness criteria and are assessed below for Alternative R-1.

No remedial actions would occur therefore the on-site community would not be exposed to additional risks. The off-site community would be protected, as radiologically-impacted sites that present unacceptable risk would not be disturbed.

No workers would be exposed to health risks during implementation of Alternative R-1 because no remedial action will be taken.

No adverse environmental impacts would result from construction and implementation of Alternative R-1 because no remedial action will be taken.

Because no remedial action will be taken, no time would be required to complete Alternative R-1. However, time is an inappropriate measure because no action is taken.

The overall rating for Alternative R-1 for short-term effectiveness is very good based on no additional risks or exposure as compared with current conditions.

### **6.5.1.6 Implementability: Alternative R-1**

Implementability includes technical and administrative feasibility and the availability of required resources. No action, including implementing ICs or constructing and operating a remedial system, would be required to implement this alternative; therefore, Alternative R-1 would be very easily implemented, and the overall rating for Alternative R-1 for implementability is very good.

### **6.5.1.7 Cost: Alternative R-1**

There are no costs associated with this alternative since no remedial activities would be performed. Therefore, the overall rating for Alternative R-1 for costs is excellent.

### **6.5.1.8 Overall Rating: Alternative R-1**

Alternative R-1 is not acceptable because it fails to meet the threshold criteria and is not acceptable in terms of long-term effectiveness.

## **6.5.2 Individual Analysis of Alternative R-2**

Alternative R-2 consists of decontamination of radiologically-impacted buildings and dismantlement if necessary. Surveys would be performed on buildings except Building 205, trenches resulting from sanitary sewer and storm line removal, and remediated storm water and sanitary sewer system components and associated soils to meet the remedial action objectives.

The above-grade portions of Building 205, the discharge tunnel, and the first 10 feet of the Building 205 shaft would be surveyed to verify that no residual radioactivity is present above the RAOs. The Building 205 shaft below 10 feet would be abandoned as is, due to the unsound condition of the building, health and safety hazards associated with field conditions, as well as many other unknowns. ICs would be implemented to minimize inadvertent contact with radiologically-impacted media.

### **6.5.2.1 Overall Protection of Human Health and the Environment: Alternative R-2**

Alternative R-2 provides protection to human health and the environment because radiologically-impacted buildings (to include the above-grade portions of Building 205, the discharge tunnel, and the shaft to 10 feet below ground), storm drains, and sanitary sewers would be remediated. Unacceptable risks based on planned reuse associated with radiologically-impacted portions of the Building 205 shaft below 10 feet would be mitigated by implementing ICs. Therefore, the overall rating for Alternative R-2 for protection of human health and the environment is protective but limited based on available information.

### **6.5.2.2 Compliance with ARARs: Alternative R-2**

Alternative R-2 includes both ICs and remedial actions. Both action- and chemical-specific ARARs associated with this alternative would be met. As a result, Alternative R-2 would meet ARARs.

### **6.5.2.3 Long-term Effectiveness and Permanence: Alternative R-2**

The factors evaluated under long-term effectiveness and permanence included the magnitude of residual risks and the adequacy and reliability of implemented controls. Abandonment of the Building 205 shaft below 10 feet as is, due to the unsound condition of the building as well as many other hazards, results in long-term effectiveness and permanence that is not protective. The long-term effectiveness and permanence of the existing Building 205 condition and shaft below 10 feet is unacceptable.

Under Alternative R-2, radiologically-impacted buildings, trenches resulting from sewer and storm line removal, and excavated storm drain and sanitary sewer piping will be remediated and surveyed to verify that the RAOs are met. The overall rating for Alternative R-2 for long-term effectiveness and permanence is good.

### **6.5.2.4 Reduction of Toxicity, Mobility, or Volume through Treatment: Alternative R-2**

Alternative R-2 includes remediation of radiologically-impacted building materials. The remedial activities do not include treatment that would result in the destruction, transformation, or irreversible reduction in contamination mobility. Therefore, Alternative R-2 rating for reduction of toxicity, mobility, or volume is poor.

### **6.5.2.5 Short-term Effectiveness: Alternative R-2**

Four factors are considered as part of the short-term effectiveness criteria and are assessed below for Alternative R-2.

The on-site and off-site community would be protected by containment controls such as dust suppression during scabbling, demolition, and removal of ROCs.

Workers would be protected during ROC remediation from Parcel C radiologically-impacted sites by implementing containment controls such as dust suppression and following health and safety protocols, including personal protective equipment and decontamination procedures.

The estimated time required to implement Alternative R-2 is less than 1 year, and the effects of implementing this alternative would be nearly immediate.

The overall rating for alternative R-2 for short-term effectiveness is very good.

### **6.5.2.6 Implementability: Alternative R-2**

Implementability includes technical and administrative feasibility and the availability of required resources. The alternative is technically feasible and easily implemented since the action can be readily implemented using widely available commercial services, materials, and equipment. The overall rating for implementability is very good.

### **6.5.2.7 Cost: Alternative R-2**

The cost estimate for Alternative R-2 was generated based on data collected from site information, dated drawings, and engineering estimates. The estimated cost for Alternative R-2 is rated as good.

Appendix B of this addendum provides a detailed description of the Alternative R-2 cost estimate and associated assumptions and limitations.

### **6.5.2.8 Overall Rating: Alternative R-2**

Alternative R-2 is protective of human health and the environment, meets ARARs, is effective in the short and long term, and is easily implemented, but is costly. The overall rating for this alternative is good.

## **6.5.3 Individual Analysis of Alternative R-3**

Alternative R-3 consists of decontamination of impacted buildings, except for Building 205, dismantlement if necessary, and surveys. In addition surveys and remediation of storm water and sanitary sewers as in R-2 are included to ensure the remedial action objectives are met. This alternative assumes that the Building 205 shaft below 10 feet would be closed in-place with backfilled stone and a concrete cap and ICs will be assigned.

### **6.5.3.1 Overall Protection of Human Health and the Environment: Alternative R-3**

Alternative R-3 provides protection to human health and the environment because it would remediate impacted buildings and the storm water and sanitary sewer system. The Building 205 shaft below 10 feet and associated piping would be closed in-place with backfilled stone, covered with a concrete cap, and ICs implemented. The backfilled stone and concrete cap would provide a barrier to eliminate risk associated with potentially encountering ROCs. Therefore, the overall rating for Alternative R-3 for protection of human health and the environment is protective.

### **6.5.3.2 Compliance with ARARs: Alternative R-3**

Alternative R-3 includes both ICs and remedial actions. Both action- and chemical-specific ARARs associated with this alternative would be met. As a result, Alternative R-3 would meet ARARs.

### **6.5.3.3 Long-term Effectiveness and Permanence: Alternative R-3**

The long-term effectiveness and permanence of the existing Building 205 condition and shaft below 10 feet is unacceptable. Thus, closure in-place of the Building 205 shaft below 10 feet with backfilled stone and a concrete provides long-term effectiveness and permanence.

Under Alternative R-3, impacted buildings, trenches resulting from sewer and storm line removal, and excavated storm water and sanitary sewer piping will be remediated and surveyed to verify that the RAOs are met. The long-term effectiveness and permanence are rated excellent. The overall rating for Alternative R-3 for long-term effectiveness and permanence is very good.

### **6.5.3.4 Reduction of Toxicity, Mobility, or Volume through Treatment: Alternative R-3**

Alternative R-3 includes remediation of impacted building materials. The remedial activities do not include treatment that would result in the destruction, transformation, or irreversible reduction in contamination mobility. Therefore, Alternative R-3 rating for reduction of toxicity, mobility, or volume is poor.

### **6.5.3.5 Short-term Effectiveness: Alternative R-3**

Four factors are considered as part of the short-term effectiveness criteria and are assessed below for Alternative R-3.

The on-site and off-site community would be protected by containment controls such as dust suppression during scabbling, demolition, and removal of ROCs.

Workers would be protected during ROC remediation from Parcel C impacted structures by implementing containment controls such as dust suppression and following health and safety protocols, including personal protective equipment and decontamination procedures.

The estimated time required to implement Alternative R-3 is less than 1 year, and the effects of implementing this alternative would be nearly immediate.

The overall rating for alternative R-3 for short-term effectiveness is very good.

### **6.5.3.6 Implementability: Alternative R-3**

Implementability includes technical and administrative feasibility and the availability of required resources. The alternative is technically feasible and easily implemented since the action can be readily implemented using widely available commercial services, materials, and equipment. The overall rating for implementability is very good.

### **6.5.3.7 Cost: Alternative R-3**

The cost estimate for Alternative R-3 was generated based on data collected from site information, dated drawings, and engineering estimates. The estimated cost for Alternative R-3 is rated as good.

Appendix B of this addendum provides a detailed description of the Alternative R-3 cost estimate and associated assumptions and limitations.

### **6.5.3.8 Overall Rating: Alternative R-3**

Alternative R-3 is protective of human health and the environment, meets ARARs, is effective in the short and long term, is easily implemented, but is costly. The overall rating for this alternative is very good.

## **6.6 COMPARISON OF RADIOLOGICALLY-IMPACTED SITE REMEDIAL ALTERNATIVES**

This section compares the radiological remedial alternatives. The discussion of each evaluation criterion generally proceeds from the alternative that best satisfies the criterion to the one that least satisfies the criterion. Table 6-1 summarizes the ratings for each alternative and shows a comparison of the ratings for each alternative for the two threshold and five balancing NCP evaluation criteria.

### **6.6.1 Overall Protection of Human Health and the Environment**

Overall protection of human health and the environment is a threshold criterion. Protection is not measured by degree; rather, each alternative is considered as either protective or not protective. Alternative R-3 is protective because it includes remediation that reduces exposure to ROCs. Alternative R-2 is protective except for the Building 205 shaft below 10 feet and associated piping. Alternative R-1 does not address any risk at the site and hence does not provide any protection to human health and the environment.

## **6.6.2 Compliance with Applicable or Relevant and Appropriate Requirements**

Compliance with ARARs is a threshold evaluation criterion. An alternative must either comply with ARARs or justification must be provided for a waiver. Alternatives R-2 and R-3 fulfill all the pertinent ARARs. Alternative R-1 does not meet the ARARs.

## **6.6.3 Long-term Effectiveness and Performance**

Alternative R-3 provides very good long-term effectiveness and performance. Alternative R-2 provides long-term effectiveness and performance for impacted sites except for the Building 205 shaft below 10 feet and associated piping. Alternative R-1 will have very little long-term effectiveness and performance because it includes no action.

## **6.6.4 Reduction of Toxicity, Mobility, or Volume through Treatment**

Alternatives R-1, R-2, and R-3 rate equally poorly because they do not include treatment that would result in the destruction, transformation, or irreversible reduction in ROC mobility.

## **6.6.5 Short-term Effectiveness**

Alternative R-1 has the least effect on the community, remedial workers, or the environment because it includes no actions and therefore would not disturb the ROCs. Alternatives R-2 and R-3 include removing and hauling contaminated soil. This would pose potential risk to the community, remedial workers, or the environment, although this risk is considered low and mitigation measures would be implemented.

## **6.6.6 Implementability**

Distinction among the alternatives for implementability is minimal. Alternatives R-2 and R-3 require implementation of ICs and utilize standard technologies that are easy to implement. Alternative R-1 does not involve remedial technologies or ICs and requires no implementation.

## **6.6.7 Cost**

Alternative R-1 requires no action; therefore, no costs are associated with this alternative. Alternative R-2 is the least costly because it does not address the Building 205 shaft below 10 feet and associated piping. Alternative R-3 is the most costly but does address all impacted sites within Parcel C.

## **6.6.8 Overall Rating of Impacted Site Alternatives**

An overall rating was assigned to each alternative. Alternative R-3 is rated very good overall for the two threshold and five balancing NCP evaluation criteria. Alternative R-2 is rated good for the two threshold and five balancing NCP evaluation criteria. Alternative R-1 is rated as not acceptable.

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## **TABLES**

**TABLE 2-1****PARCEL C IMPACTED AREAS, RADIONUCLIDES OF CONCERN,  
HISTORICAL USES, AND PLANNED REUSE**

<b>Building Number or Area Title</b>	<b>Radionuclides of Concern</b>	<b>Building or Area Use</b>	<b>Planned Reuse</b>
203	Strontium-90 Cesium-137 Radium-226 Plutonium-239	Power plant facility where contaminated fuel oil was potentially burned	Research and Development
205 and Discharge Channel	Strontium-90 Cesium-137 Radium-226 Plutonium-239	Pump house for Drydock 2	Educational/Cultural
211	Cesium-137 Radium-226 Thorium-232	Machinery and electrical test/repair facility and contractor LLRW storage	Educational/Cultural and Open Space
214	Strontium-90 Cesium-137 Radium-226 Plutonium-239	Combat Weapons System office, administrative offices, and NRDL Health Physics counting room	Educational/Cultural
224	Strontium-90 Cesium-137 Plutonium-239	Air raid shelter and OPERATION CROSSROADS and GREENHOUSE fallout sample storage	Educational/Cultural
241	Thorium-232	Forge shop with use of natural thorium fire brick and potassium nitrate	Research and Development
253	Strontium-90 Cesium-137 Radium-226 Plutonium-239 Thorium-232	Radiography and instrument calibration, storage of equipment from OPERATION CROSSROADS ships, and probable location of radium paint activities	Educational/Cultural
271	Radium-226	Spray painting, paint shop annex, equipment storage/barge service office	Research and Development
272	Cobalt-60 Cesium-137 Radium-226	Machine shop and possible radiography	Research and Development

**TABLE 2-1****PARCEL C IMPACTED AREAS, RADIONUCLIDES OF CONCERN,  
HISTORICAL USES, AND PLANNED REUSE**

<b>Building Number or Area Title</b>	<b>Radionuclides of Concern</b>	<b>Building or Area Use</b>	<b>Planned Reuse</b>
Sanitary Sewer System	Strontium-90 Cesium-137 Radium-226	Radiological liquid wastes from ship decontaminations and buildings	Educational/Cultural, Research and Development, Mixed Use, and Open Space
Storm Water Sewer System	Strontium-90 Cesium-137 Radium-226	Radiological liquid wastes from ship decontaminations and buildings	Educational/Cultural, Research and Development, Mixed Use, and Open Space

***Abbreviations and Acronyms:***

LLRW – low level radioactive waste  
NRDL – Naval Radiological Defense Laboratory

TABLE 2-2

## Historical Radiological Studies, Surveys, or Reports Associated with Parcel C Radiologically-Impacted Sites

Report Date	Building Site	Duration Dates	Investigation Report Title	Company	Parcel C or Facility-Wide	Objective	Activity	Conclusions
9 July 2003	211	January 2002 through July 2003	Survey Plan and Survey Results Building 211 Characterization	New World Technology (NWT)	Facility-Wide	Conduct scoping and characterization surveys, soil and other media sampling and Final Status Surveys meeting MARSSIM guidelines	Class 1 and 2 surveys completed	Elevated levels found in areas not used for (current) LLRW storage: summary of actions completed submitted to RASO. Remediation and Final Status Survey (FSS) remain to be done
6 December 1974	214	Unknown	Radioactive Survey; results of	Hunters Point Shipyard (HPS) Internal Survey	Partial Facility-Wide	Radiation/contamination surveys of selected buildings at disestablishment of shipyard	Address concerns about prior use of radioactive materials at HPS by NRDL and determine if sites meet free-release criteria	No detectable activity found by either swipe or instrument survey. Class 1 survey needed.
15 October 1996	214	1996-1997	Phase III Radiation Investigation	PRC Environmental Management, Inc.	Facility-Wide	Address concerns about prior use of radioactive materials at HPS by NRDL and determine if sites meet free-release criteria	Reviewed previous documented surveys to determine if further activity was required	The survey performed by HPS in 1974 was adequate: no further surveys recommended or performed
7 January 2003	214	January 2002 through January 2003	Survey Plan and Survey Results	New World Technology (NWT)	Facility-Wide	Conduct scoping and characterization surveys, soil and other media sampling and Final Status Surveys meeting MARSSIM guidelines	Class 3 surveys completed	No elevated levels found: Final Status Survey results submitted to RASO
18 March 2003	224	January 2002 through March 2003	Survey Plan and Survey Results Building 224 Characterization	New World Technology (NWT)	Facility-Wide	Conduct scoping and characterization surveys, soil and other media sampling and Final Status Surveys meeting MARSSIM guidelines	Class 3 surveys completed	No elevated levels found: Final Status Survey results submitted to RASO
13 June 2003	241	January 2002 through March 2003	Survey Plan and Survey Results Building 241 Characterization	New World Technology (NWT)	Facility-Wide	Conduct scoping and characterization surveys, soil and other media sampling and Final Status Surveys meeting MARSSIM guidelines	Class 3 surveys completed: elevated levels found. Removed firebrick and potassium nitrate. Class 1 and 2 surveys completed	No elevated levels found after Class 1 and 2 surveys: Final Status Survey submitted to RASO

TABLE 2-2

## Historical Radiological Studies, Surveys, or Reports Associated with Parcel C Radiologically-Impacted Sites

Report Date	Building Site	Duration Dates	Investigation Report Title	Company	Parcel C or Facility-Wide	Objective	Activity	Conclusions
6 December 1974	253	1974: exact dates unknown	Radioactive Survey; results of	Hunters Point Shipyard (HPS) Internal Survey	Partial Facility-Wide	Radiation/contamination surveys of selected buildings at disestablishment of shipyard	Swipe and instrument surveys of sixth floor	No detectable activity found by either swipe or instrument survey
15 October 1996	253	1996	Phase III Radiation Investigation	PRC Environmental Management, Inc.	Facility-Wide	Address concerns about prior use of radioactive materials at HPS by NRDL and determine if sites meet free-release criteria	Reviewed previous documented surveys to determine if further activity was required	The survey performed by HPS in 1974 was adequate: no further surveys recommended or performed
20 October 2003	253	January 2002 through October 2003	Survey Plan and Survey Results Building 253 Characterization	New World Technology (NWT)	Facility-Wide	Conduct scoping and characterization surveys, soil and other media sampling and Final Status Surveys meeting MARSSIM guidelines	Class 3 surveys completed on floors 1-6. Contamination found and remediated on fifth and sixth floors. Class 1 surveys conducted on fifth and sixth floors and roof and additional surveys throughout building. Contamination found throughout building, ventilation shafts, piping, manholes, and on ledge outside building. Roof and parts of ventilation system remediated.	Summary of activities completed submitted to RASO: remediation and Final Status Survey recommended
23 November 2005	253	August 2004 through November 2004	Internal Draft Characterization Survey and Results	New World Technology (NWT)	Parcel C (Building 253 only)	Complete the characterization survey and collect data to assess the nature and extent of radioactive contamination in Building 253	Survey equipment, materials, drainage systems, and floor surfaces by direct measurement and swipes to determine extent of contamination	Contamination remains in the building and additional remediation is needed
28 March 2003	271	January 2002 through March 2003	Survey Plan and Survey Results Building 271 Characterization	New World Technology (NWT)	Facility-Wide	Conduct scoping and characterization surveys, soil and other media sampling and Final Status Surveys meeting MARSSIM guidelines	Class 3 survey completed. Characterization, remediation and Class 1 survey completed.	Radium contamination found. Final Status Survey results submitted to RASO. Class 1 survey needed.

**TABLE 2-2**

**Historical Radiological Studies, Surveys, or Reports Associated with Parcel C Radiologically-Impacted Sites**

<b>Report Date</b>	<b>Building Site</b>	<b>Duration Dates</b>	<b>Investigation Report Title</b>	<b>Company</b>	<b>Parcel C or Facility-Wide</b>	<b>Objective</b>	<b>Activity</b>	<b>Conclusions</b>
28 March 2003	272	January 2002 through March 2003	Survey Plan and Survey Results Building 272 Characterization	New World Technology (NWT)	Facility-Wide	Conduct scoping and characterization surveys, soil and other media sampling and Final Status Surveys meeting MARSSIM guidelines	Class 3 survey completed: no contamination found	Final Status Survey results submitted to RASO. Class 1 survey needed.

**TABLE 2-3****LIST OF RADIONUCLIDES, HALF-LIVES, AND RADIATIONS EMITTED**

<b>Radionuclides of Concern</b>	<b>Half-life</b>	<b>Radiations Released When Decayed</b>
Cesium-137	30 years	Beta particles, gamma rays
Cobalt-60	5.3 years	Beta particles, gamma rays
Plutonium-239	24,100 years	Alpha particles, x-rays
Radium-226	1,600 years	Alpha and beta particles, and gamma rays
Strontium-90	29.1 years	Beta particles
Thorium-232	14,100,000,000 years	Alpha particles, gamma rays

TABLE 2-4

## PARCEL C BUILDING/AREA ASSESSMENT AND CLASSIFICATION

Building No. or Area	Contamination Potential					Contaminated Media							Potential Migration Pathways						
	Known-restricted Access	Known-continued Access	Likely	Unlikely	Unknown	Surface Soil	Subsurface Soils	Surface Water	Groundwater	Air	Structures	Drainage System	Surface Soil	Subsurface Soil	Surface Water	Groundwater	Air	Structures	Drainage System
203				✓		L	N	N	N	N	L	N	L	N	N	N	N	L	N
205 and Discharge Channel				✓		N	N	N	N	N	L	L	N	N	N	N	N	L	L
211		✓				N	N	N	N	N	M	L	N	N	N	N	N	L	L
214				✓		N	N	N	N	N	L	N	N	N	N	N	N	L	N
224			✓			N	N	N	N	N	L	N	N	N	N	N	N	L	N
241				✓		N	N	N	N	N	L	N	N	N	N	N	N	L	N
253		✓				N	N	N	N	N	H	H	N	N	N	N	N	M	M
271				✓		N	N	N	N	N	L	N	N	N	N	N	N	L	N
272				✓		N	N	N	N	N	L	N	N	N	N	N	N	L	N
Storm Water Sewer System		✓				N	L	N	N	N	L	H	N	L	N	N	N	L	M
Sanitary Sewer System		✓				N	L	N	N	N	L	H	N	L	N	N	N	L	M

**Abbreviations and Acronyms:**

- H High – Evidence of contamination in the media or migration pathway has been identified.  
M Moderate – The potential for contamination in the media or migration pathway exists, although the extent has not been fully assessed.  
L Low – The potential for contamination in the type of media or migration pathway is remote.  
N None – Evidence of contamination in the specific media or migration pathway has not been found, or known contamination has been removed, and surveys indicate that the media or migration pathway meets today's release criteria.

**TABLE 3-1**  
**PARCEL C BUILDINGS**  
**ALONG WITH THEIR IMPACTED REDEVELOPMENT BLOCKS,**  
**PLANNED REUSE, AND REUSE SCENARIOS**

<b>Building/ Site Number</b>	<b>Impacted Redevelopment Block<sup>a</sup></b>	<b>Planned Reuse</b>	<b>Reuse Scenario</b>
203	23	Research and Development	Industrial
205 and discharge channel	22	Educational/Cultural	Industrial
211	25 and COS-3	Educational/Cultural and Open Space	Industrial
214	20B	Educational/Cultural	Industrial
224	25	Educational/Cultural	Industrial
241	18	Research and Development	Residential
253	25	Educational/Cultural	Industrial
271	24	Research and Development	Residential
272	24	Research and Development	Residential
Storm Water Sewer System	All Blocks	Educational/Cultural, Mixed Use, Research and Development, Open Space	Residential
Sanitary Sewer System	All Blocks	Educational/Cultural, Mixed Use, Research and Development, Open Space	Residential

**Notes:**

COS Parcel C Open Space

<sup>a</sup> There are seven redevelopment blocks in this table but there are a total of 15 Parcel C redevelopment blocks as shown in Figure 2-3.

TABLE 3-2

**HUNTERS POINT SHIPYARD RESIDUAL  
RADIOACTIVITY REMEDIATION GOALS<sup>f</sup>**

Radionuclides of Concern	Surfaces (dpm/100 cm <sup>2</sup> )		Soil <sup>e f</sup> (pCi/g)		Water <sup>f</sup> (pCi/L)
	Equipment, Waste <sup>a</sup> (dpm/100 cm <sup>2</sup> )	Structures <sup>b</sup> (dpm/100 cm <sup>2</sup> )	Construction Worker	Residential	
Cesium-137	5,000	5,000	0.113	0.113	119
Cobalt-60	5,000	5,000	0.0602	0.0361	100
Plutonium-239	100	100	14.0	2.59	15
Radium-226	100	100	1.0d	1.0d	5.0e
Strontium-90	1,000	1,000	10.8	0.331	8
Thorium-232	1,000	36.5	19.0	1.69	15

**Notes:**

- <sup>a</sup> These limits are based on AEC *Regulatory Guide 1.86* (1974). Limits for removable surface activity are 20 percent of these values.
- <sup>b</sup> These limits are based on 25 mrem/y, using D&D Version 2 or *Regulatory Guide 1.86*, whichever is lower.
- <sup>c</sup> EPA PRGs for two future-use scenarios.
- <sup>d</sup> Limit is 1 pCi/g above background; not to exceed 2 pCi/g total, per agreement with EPA.
- <sup>e</sup> Limit is for total radium concentration.
- <sup>f</sup> Taken from *Revised Final Basewide Radiological Removal Action, Action Memorandum*. 2006. Hunters Point Shipyard, San Francisco, California. February 14.

**Abbreviations and Acronyms:**

- AEC – Atomic Energy Commission  
 cm<sup>2</sup> – square centimeter  
 dpm – disintegration per minute  
 EPA – U.S. Environmental Protection Agency  
 MDA – minimum detectable activity  
 mrem/y – millirem per year  
 pCi/g – picocurie per gram  
 PRG – Preliminary Remediation Goal

**TABLE 3-3**  
**RESRAD-BUILD RESULTS<sup>a</sup>**

Parcel C Impacted Sites	Radiological Risk <sup>b</sup>	Dose <sup>cd</sup>
Building 203	1.44 x 10 <sup>-6</sup>	5.43
Building 205 and Discharge Channel	1.44 x 10 <sup>-6</sup>	5.43
Building 211	1.30 x 10 <sup>-6</sup>	9.29
Building 214	1.44 x 10 <sup>-6</sup>	5.43
Building 224	1.48 x 10 <sup>-6</sup>	7.02
Building 241	8.70 x 10 <sup>-7</sup>	12.8
Building 253	1.29 x 10 <sup>-6</sup>	9.32
Building 271	1.34 x 10 <sup>-6</sup>	0.64
Building 272	3.09 x 10 <sup>-6</sup>	3.66

**Notes:**

- a Total risk and dose is equivalent to incremental risk and dose  
b Total excess lifetime carcinogen risk  
c millirems per year  
d Dose is calculated using DCGLs. Actual dose will be determined after remediation.

**TABLE 3-4**  
**RESRAD RESULTS**

<b>Total Dose and Risk</b>		
<b>Impacted Areas</b>	<b>Radiological Risk<sup>a</sup></b>	<b>Dose<sup>bc</sup></b>
Storm Water Sewer System	$6.75 \times 10^{-5}$	3.09
Sanitary Sewer System	$6.75 \times 10^{-5}$	3.09
<b>Incremental Dose and Risk</b>		
<b>Impacted Areas</b>	<b>Radiological Risk<sup>a</sup></b>	<b>Dose<sup>bc</sup></b>
Storm Water Sewer System	$4.54 \times 10^{-5}$	2.08
Sanitary Sewer System	$4.54 \times 10^{-5}$	2.08

**Notes:**

- <sup>a</sup> Total excess lifetime carcinogen risk.  
<sup>b</sup> millirems per year.  
<sup>c</sup> Dose is calculated using DCGLs. Actual dose will be determined after remediation.

**TABLE 3-5**  
**COMBINED TOTAL RISK FROM**  
**CHEMICAL AND RADIOLOGICAL RISKS**

<b>Parcel C Impacted Sites</b>	<b>Radiological Risk<sup>b</sup></b>	<b>Chemical Risk<sup>a,b,c</sup></b>	<b>Redevelopment Block</b>	<b>Parcel C Grid(s)</b>	<b>Risk Combination Results</b>
Building 203	$1.44 \times 10^{-6}$	$5.00 \times 10^{-4}$	23	089040	$5.01 \times 10^{-4}$
Building 205 and Discharge Channel	$1.44 \times 10^{-6}$	$4.00 \times 10^{-6}$	22	BB03	$5.40 \times 10^{-6}$
Building 211	$1.30 \times 10^{-6}$	$5.00 \times 10^{-5}$	25 and COS-3	BE06	$5.13 \times 10^{-5}$
Building 214	$1.44 \times 10^{-6}$	$5.00 \times 10^{-5}$	20B	BA09	$5.14 \times 10^{-5}$
Building 224	$1.48 \times 10^{-6}$	$4.00 \times 10^{-5}$	25	BD08	$4.14 \times 10^{-5}$
Building 241	$8.70 \times 10^{-7}$	$4.00 \times 10^{-4}$	18	079041	$4.08 \times 10^{-4}$
Building 253	$1.29 \times 10^{-6}$	$4.00 \times 10^{-4}$	25	BD08	$4.01 \times 10^{-4}$
Building 271	$1.34 \times 10^{-6}$	$4.00 \times 10^{-4}$	24	093035, 094035	$4.01 \times 10^{-4}$
Building 272	$3.09 \times 10^{-6}$	$2.00 \times 10^{-3}$	24	088036	$2.00 \times 10^{-3}$
Sanitary Sewer System	$6.75 \times 10^{-5}$	$2.00 \times 10^{-3}$	All Blocks	088036	$2.72 \times 10^{-3}$
Storm Water Sewer System	$6.75 \times 10^{-5}$	$2.00 \times 10^{-3}$	All Blocks	088036	$2.72 \times 10^{-3}$

**Notes:**

- <sup>a</sup> Chemical risk was taken from Revised Feasibility Study Report for Parcel C, Tables 3-2 and 3-3.
- <sup>b</sup> Excess lifetime carcinogenic risk.
- <sup>c</sup> The worst case chemical risk was chosen from the grids that the radiologically-impacted buildings or sites overlay.

**TABLE 3-6**  
**COMBINED INCREMENTAL RISK**  
**FROM CHEMICAL AND RADIOLOGICAL RISKS**

<b>Parcel C Impacted Sites</b>	<b>Radiological Risk<sup>b</sup></b>	<b>Chemical Risk<sup>a,b,c</sup></b>	<b>Redevelopment Block</b>	<b>Parcel C Grid(s)</b>	<b>Risk Combination Results</b>
Building 203	$1.44 \times 10^{-6}$	$5.00 \times 10^{-4}$	23	089040	$5.01 \times 10^{-4}$
Building 205 and Discharge Channel	$1.44 \times 10^{-6}$	$6.00 \times 10^{-7}$	22	BA03, BB03	$2.00 \times 10^{-6}$
Building 211	$1.30 \times 10^{-6}$	$5.00 \times 10^{-5}$	25 and COS-3	BE06	$5.13 \times 10^{-5}$
Building 214	$1.44 \times 10^{-6}$	$5.00 \times 10^{-5}$	20B	BA09	$5.14 \times 10^{-5}$
Building 224	$1.48 \times 10^{-6}$	$3.00 \times 10^{-5}$	25	BD08	$3.14 \times 10^{-5}$
Building 241	$8.70 \times 10^{-7}$	$4.00 \times 10^{-4}$	18	079041	$4.00 \times 10^{-4}$
Building 253	$1.29 \times 10^{-6}$	$4.00 \times 10^{-5}$	25	BD08	$4.12 \times 10^{-5}$
Building 271	$1.34 \times 10^{-6}$	$4.00 \times 10^{-4}$	24	093035, 094035	$4.01 \times 10^{-4}$
Building 272	$3.09 \times 10^{-6}$	$2.00 \times 10^{-3}$	24	088036	$2.00 \times 10^{-3}$
Sanitary Sewer System	$4.54 \times 10^{-5}$	$2.00 \times 10^{-3}$	All Blocks	088036	$2.04 \times 10^{-3}$
Storm Water Sewer System	$4.54 \times 10^{-5}$	$2.00 \times 10^{-3}$	All Blocks	088036	$2.04 \times 10^{-3}$

**Notes:**

- <sup>a</sup> Chemical risk was taken from Revised Feasibility Study Report for Parcel C, Tables 3-8 and 3-9.
- <sup>b</sup> Excess lifetime carcinogenic risk.
- <sup>c</sup> The worst case chemical risk was chosen from the grids that the radiologically-impacted buildings overlay.

**TABLE 4-1**  
**POTENTIAL FEDERAL AND STATE ARARs TO BE CONSIDERED CRITERIA**  
**FOR POTENTIALLY CONTAMINATED SITES AT HPS**

Regulation	Requirement	Citation <sup>b</sup>	ARAR Determination	Comments
<b>Chemical-Specific<sup>a</sup> ARAR</b>				
Resource Conservation and Recovery Act	Defines RCRA hazardous waste. A solid waste is characterized as toxic, based on the TCLP, if the waste exceeds the TCLP maximum concentrations.	22 CFR 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100	Applicable	Applicable for determining whether waste is hazardous and already identified in the Revised FS for Parcel C.
Cal/EPA Department of Toxic Substances Control	Definitions of designated waste, nonhazardous waste, and inert waste.	CCR tit. 27 §§ 20210, 20220, and 20230	Applicable	Potential ARARs for classifying waste and determining ARAR status of other requirements. These requirements are already identified in the Revised FS Report for Parcel C (SulTech, 2007).
Uranium Mill Tailings Radiation Control Act	Standards for cleanup of land and buildings contaminated with <sup>226</sup> Ra, <sup>228</sup> Ra, and thorium from inactive uranium processing sites.  As a result of residual radioactive materials from any designated processing site:  (a) The concentration of <sup>226</sup> Ra in land averaged over any area of 100 square meters shall not exceed the background level by more than:  (1) 5 pCi/g, averaged over the first 15 cm of soil below the surface, and  (2) 15 pCi/g, averaged over 15-cm-thick layers of soil more than 15 cm below the surface.	40 CFR 192.12(a), 192.32(b)(2) and 192.41	Relevant and Appropriate	Not applicable because Parcel C is not an UMTRCA site and is not potentially relevant and appropriate for sites with soil contaminated with radioactive waste.  The surface and subsurface concentration of 5pCi/g is potentially relevant and appropriate only for an unrestricted land-use scenario.
Uranium Mill Tailings Radiation	In any occupied or habitable building, the objective of remedial action shall be, and reasonable effort shall be made to achieve, an	40 CFR 192.12(b)(1) 192.41(b)	Relevant and Appropriate	Not applicable because Parcel C is not an

**TABLE 4-1**  
**POTENTIAL FEDERAL AND STATE ARARs TO BE CONSIDERED CRITERIA**  
**FOR POTENTIALLY CONTAMINATED SITES AT HPS**

Regulation	Requirement	Citation <sup>b</sup>	ARAR Determination	Comments
Control Act	annual average (or equivalent) radon decay product concentration (including background) not to exceed 0.02 WL. In any case, the radon decay product concentration (including background) shall not exceed 0.03 WL. Provisions applicable to <sup>222</sup> Rn shall also apply to <sup>220</sup> Rn.			UMTRCA site. Relevant and appropriate since the alternatives will result in radioactive material with radioactive contamination that may produce this level of dose.
Uranium Mill Tailings Radiation Control Act	Concentration limits for cleanup of gamma radiation in buildings at inactive uranium processing sites designated for remedial action.  In any occupied or habitable building, the level of gamma radiation shall not exceed the background level by more than 20 microroentgens per hour.	40 CFR 192.12(b)(2)	Relevant and Appropriate	Not applicable because Parcel C is not an UMTRCA site. A potential ARAR since the alternatives will leave a building with radioactive contamination at the remedial action objective level.
Radiological Criteria for Unrestricted Use at Closing NRC Licensed Facilities	A site will be considered acceptable for unrestricted use if the residual radioactivity that is distinguishable from background radiation results in a TEDE to an average member of the critical group that does not exceed 25 mrem/y, including that from groundwater sources of drinking water, and that the residual radioactivity has been reduced to ALARA.	10 CFR 20.1402	Relevant and Appropriate	This ARAR is not applicable because Parcel C is not an NRC-licensed radiologically contaminated site. This ARAR is potentially relevant and appropriate for an unrestricted land-use scenario <sup>c</sup> .
NESHAPs under CAA that Apply to Radionuclides	Emissions of radionuclides into the ambient air from Department of Energy facilities shall not exceed those amounts that would cause any member of the public to receive in any year an effective dose equivalent of 10 mrem/y.	40 CFR 61 Subpart H, 61.92	Relevant and Appropriate	Not applicable because Parcel C is not a Department of Energy site  Potentially relevant and appropriate because

**TABLE 4-1**  
**POTENTIAL FEDERAL AND STATE ARARs TO BE CONSIDERED CRITERIA**  
**FOR POTENTIALLY CONTAMINATED SITES AT HPS**

Regulation	Requirement	Citation <sup>b</sup>	ARAR Determination	Comments
				potential radioactive material remains after cleanup under restricted conditions.
<b>Location-specific ARAR</b>				
National Historic Preservation Act of 1966	Action to preserve historic properties; planning of action to minimize harm to properties listed on or eligible for listing on the national Register of Historic Places.	16 U.S.C., Sections 470-470x-6, 36 CFR 800, and 40 CFR 6.301(b)	Applicable	The DON has determined that Buildings 205 and 253 may be eligible for inclusion on the National Register of Historic Places. The DON is in compliance with this ARAR because none of the remedial alternatives evaluated in this Revised Feasibility Study Addendum include activities that will have a significant impact on the building structure.
McAteer-Petris Act	Reduce fill and disposal of dredged material in San Francisco Bay, maintain marshes and mudflats to the fullest extent possible to conserve wildlife, abate pollution, and protect the beneficial uses of the Bay.	San Francisco Bay Plan at CCR title 14 §§ 10110 through 11990	Relevant and Appropriate	The San Francisco Bay Plan is an approved state coastal zone management program, and the DON will continue to conduct its response actions in accordance with the goals of the San Francisco Bay Plan.
McAteer-Petris Act	Reduce fill and disposal of dredged material in San Francisco Bay.	California Government Code §§	Relevant and Appropriate	The San Francisco Bay Plan is an approved state

**TABLE 4-1**  
**POTENTIAL FEDERAL AND STATE ARARs TO BE CONSIDERED CRITERIA**  
**FOR POTENTIALLY CONTAMINATED SITES AT HPS**

Regulation	Requirement	Citation <sup>b</sup>	ARAR Determination	Comments
		66600 – 66661.		coastal zone management program, and the DON will continue to conduct its response actions in accordance with the goals of the San Francisco Bay Plan.
Federal Coastal Zone Management Act	This act specifies that federal actions that affect the coastal zone must be consistent with the policies of the San Francisco Bay Conservation and Development Commission's federally approved coastal management program.	16 U.S.C. 1456(c)(1)(A)	Relevant and Appropriate	The San Francisco Bay Plan is an approved state coastal zone management program, and the DON will continue to conduct its response actions in accordance with the goals of the San Francisco Bay Plan.

**Notes:**

- <sup>a</sup> Many potential action-specific ARARs contain chemical-specific limitations and are addressed in the action-specific ARAR tables.
- <sup>b</sup> Only the substantive provisions of the requirements cited in this table are potential ARARs.
- <sup>c</sup> U.S. EPA does not believe this NRC regulation is protective of human health and the environment, and the HPS cleanup goals are more protective. This regulation is an ARAR only for radiologically-impacted sites that are undergoing TCRA and any additional remedial action required for those sites. It is not an ARAR for radiologically-impacted sites, buildings, or structures that will be transferred with engineering and institutional controls for radiological contaminants.

**Abbreviations and Acronyms:**

µg/L – microgram per liter  
ALARA – as low as reasonable achievable  
ARAR – applicable or relevant and appropriate requirement  
<sup>14</sup>C – carbon-14

CFR – Code of Federal Regulations  
Ci – curie  
DON – Department of the Navy  
<sup>3</sup>H – hydrogen-3  
HPS – Hunters Point Shipyard

TABLE 4-1

**POTENTIAL FEDERAL AND STATE ARARs TO BE CONSIDERED CRITERIA  
FOR POTENTIALLY CONTAMINATED SITES AT HPS**

LLRW – low-level radioactive waste  
MCL – maximum contaminant level  
mrem/y – millirem per year  
NRC – Nuclear Regulatory Commission  
pCi/L – picocurie per liter

<sup>226</sup>Ra – radium-226  
<sup>228</sup>Ra – radium-228  
<sup>90</sup>Sr – strontium-90  
TEDE – total effective dose equivalent  
U.S.C. – United States Code

**TABLE 4-2  
IDENTIFICATION AND SCREENING OF TECHNOLOGY TYPES  
AND PROCESS OPTIONS FOR SOIL, GROUNDWATER, AND STRUCTURES**

General Response Action	Remedial Technology Type	Process Option	Description	Effectiveness	Implementability	Cost	Screening Comments
<b>SOIL</b>							
No Action	Not Applicable	Not Applicable	No Action	Does not achieve RAOs.	Not acceptable to local government or public.	None	<b>Retained</b> – required by NCP.
Institutional Controls	Institutional Controls	Institutional Controls	Fencing, barriers, and posting signs to restrict land use where there is exposure to potentially contaminated soil.  Prohibits activities not specified for the designated land use; prohibits growing produce in native soil.  Restricts the use of the parcel to those re-uses that are identified at the time the ROD amendment is signed; includes criteria during and after future development to assure that mitigated exposure conditions are maintained such as covers, barriers, or other engineering controls.	Effective at preventing exposure of receptors to contamination, especially when used in combination with other options; does not reduce volume or toxicity of contamination.	Requires legal documents and authority to enforce restrictions, Easily implemented.	Low Cost	<b>Eliminated</b> – No fill areas hence soils will be released.
Removal	Excavation	Conventional excavation	Excavation of contaminants, soil and materials with the ROC concentration above RAOs.	Effective at removing contamination and preventing long-term exposure to contamination; may expose workers and environment to contaminants during implementation; uses conventional construction methods; proven technology.	Easily implemented for defined areas of contamination; easily implemented for ROCs; may need to excavate to 10 feet bgs.	Moderate cost (based on previous excavations)	<b>Retained</b> – effective for ROCs and quickly implemented; moderate cost.

**TABLE 4-2**  
**IDENTIFICATION AND SCREENING OF TECHNOLOGY TYPES**  
**AND PROCESS OPTIONS FOR SOIL, GROUNDWATER, AND STRUCTURES**

General Response Action	Remedial Technology Type	Process Option	Description	Effectiveness	Implementability	Cost	Screening Comments
	Off-site Disposal	Disposal of excavated radioactively contaminated soil and material into a facility licensed to receive low-level radioactive waste.	Transport and dispose of soils at a permitted treatment and disposal facility.	Effective at preventing exposure of receptors to contamination; does not reduce total amount of contamination; may expose workers and environment to contaminants during implementation; conventional method.	Requires appropriate transportation permits and waste characterization. Easily implemented.	High cost	<b>Retained</b> – effective; easily and quickly implemented; permanent remedy; high cost.
Containment	Covers	Soil, Asphalt, or Concrete Cover	Placement of a soil, asphalt, or concrete cover over contaminated soil, prevents contact with contamination.	Effective at preventing exposure of receptors to contamination, must be used with land-use controls to maintain protectiveness, susceptible to weathering and cracking.	Paved areas can be easily maintained using conventional methods; soil or asphalt cover could be used in areas currently unpaved. Easily implemented.	Moderate cost	<b>Retained</b> – for areas that are paved or require paving to achieve planned land uses; can be used with a soil cover.

**TABLE 4-2**  
**IDENTIFICATION AND SCREENING OF TECHNOLOGY TYPES**  
**AND PROCESS OPTIONS FOR SOIL, GROUNDWATER, AND STRUCTURES**

General Response Action	Remedial Technology Type	Process Option	Description	Effectiveness	Implementability	Cost	Screening Comments
		Manual screening	Manual screening of excavated soil and material to separate the soil and material exceeding the cleanup standard from the soil below the cleanup standard. This may be accomplished by soil sampling and analyses in the field.	Effective at preventing exposure of receptors to contamination; reduces the total amount of contamination; may expose workers and environment to contaminants during implementation; conventional method.	Requires appropriate equipment, instrumentation, and trained personnel.	High cost	<b>Retained</b> – for fill areas that need to be excavated.
<b>GROUNDWATER</b>							
No action	Not Applicable	Not Applicable	No Action	Not effective	Easy to implement	Not Applicable	<b>Retained</b> – required by NCP.
Institutional Controls	Institutional Controls	Institutional Controls	Prohibits activities that could spread groundwater contamination by requiring locked well caps and secured utility access covers and requiring identifying and securing any additional conduit where potential receptors could be exposed to the groundwater; requires posted signs and locked doors to prohibit occupancy of existing buildings or other enclosures where there is unacceptable risk from the vapor intrusion pathway; requires vapor barriers for new construction in areas of unacceptable risk.  Prohibits extraction and use of groundwater at the site, except actions performed in accordance with site health and safety requirements; allows only designated land use	Effective as long as ICs are in effect	Easy to implement	Low cost	<b>Retained</b> – easily implemented and effective; prevents exposure to ROCs.

**TABLE 4-2**  
**IDENTIFICATION AND SCREENING OF TECHNOLOGY TYPES**  
**AND PROCESS OPTIONS FOR SOIL, GROUNDWATER, AND STRUCTURES**

General Response Action	Remedial Technology Type	Process Option	Description	Effectiveness	Implementability	Cost	Screening Comments
			in accordance with the proposed redevelopment plan. Prohibits certain type of construction and development based on designated land use, and must be in accordance with the land use restrictions; includes criteria during and after development to assure that mitigated exposure conditions to groundwater and to VOCs from the vapor intrusion pathway are maintained or modified for continued protection for the receptors.				
Treatment	Passive	Monitoring	Groundwater is sampled and analyzed for ROCs; results are evaluated and reported to assess if ROCs are in aquifer and migration of the contaminants to potential exposure points.	Effective for all ROCs at low concentrations	Easily implemented	Low cost	<b>Retained</b> – easily implemented; effective for all ROCs at low concentrations; low cost; slow results.
		Natural recovery	ROCs are allowed to naturally attenuate via decay, dispersion, dilution, or adsorption; requires monitoring to assess recovery rates and success.	Effective for all ROCs at low concentrations	Easily implemented	Low cost	<b>Retained</b> – but slow results.

**TABLE 4-2**  
**IDENTIFICATION AND SCREENING OF TECHNOLOGY TYPES**  
**AND PROCESS OPTIONS FOR SOIL, GROUNDWATER, AND STRUCTURES**

General Response Action	Remedial Technology Type	Process Option	Description	Effectiveness	Implementability	Cost	Screening Comments
	Ex-Situ Pump and Treat	Chemical, physical, or biological treatment	Vertical or horizontal wells are pumped to extract contaminated groundwater from the saturated zone; extracted groundwater is treated through chemical, physical, or biological processes; treated water is released to the surface, to surface water, or to a wastewater treatment plant or is re-injected	Not effective for all chemicals and not effective for ROCs	Not effective for ROCs	High O & M cost	<b>Eliminated</b> - not effective for ROCs.
		Dual Phase Extraction	Vertical wells are pumped to extract contaminated groundwater, and are under negative pressure to extract volatile contaminants for the water surface, capillary fringe, and the vadose zone soils; extracted groundwater and vapors are treated through chemical, physical, or biological processes.	Effective for VOCs and not ROCs	Requires high level of effort to implement	High O&M cost	<b>Eliminated</b> – mostly effective for VOC chemicals not ROCs.
	In-Situ Physical/Chemical Treatment	Chemical Oxidation	Chemicals such as hydrogen peroxide, potassium permanganate, or Fenton's reagent are injected into the contaminated groundwater to enhance the oxidation state of the aquifer, chemically altering dissolved contaminants to less toxic compounds or precipitants.	Effective for chemicals and not ROCs	Not easily implemented	High cost	<b>Eliminated</b> – not retained; alternative retained in SulTech, 2007.
		Chemical Reduction	Chemicals such as zero-valent iron, are injected into the contaminated groundwater to enhance the reduction state of the aquifer, chemically altering dissolved contaminants to less toxic compounds or precipitants.	Not effective for ROCs	Not easily implemented	High cost	<b>Eliminated</b> – not retained; alternative retained in SulTech, 2007.
		Electrokinetic Separation	Induced electronic current creates an acid front (low pH) at the anode and a base front (high pH) at the cathode; acidic conditions mobilize metal contaminants for transport and collection at the cathode.	Not effective for ROCs	Not easily implemented	High cost	<b>Eliminated</b> – not retained; alternative eliminated in SulTech, 2007.
		Air Sparging with	Air is injected into the aquifer to mobilize	Not effective for ROCs	Not easily	High cost	<b>Eliminated</b> – not

**TABLE 4-2**  
**IDENTIFICATION AND SCREENING OF TECHNOLOGY TYPES**  
**AND PROCESS OPTIONS FOR SOIL, GROUNDWATER, AND STRUCTURES**

General Response Action	Remedial Technology Type	Process Option	Description	Effectiveness	Implementability	Cost	Screening Comments
		SVE	volatile organic chemicals into the unsaturated vadose zone soil; volatile organic chemicals are extracted from the soils with SVE system.		implemented		retained; alternative eliminated in SulTech, 2007.
		Ozone Sparging with SVE	Ozone is injected into the aquifer to mobilize volatile chemicals into the unsaturated vadose zone soil and create a highly oxygenized environment; mobilized chemicals are extracted from the soils with SVE system.				<b>Eliminated</b> – not retained; alternative eliminated in SulTech, 2007.
		Permeable Reactive Barriers	Passive reactive treatment walls are installed across the flow path of a contaminant plume, allowing the water portion of the plume to passively move through the wall; these walls allow the water to pass while prohibiting movement of contaminants by employing agents.				<b>Eliminated</b> – not retained; alternative eliminated in SulTech, 2007.
	In-Situ Biological Treatment	Aerobic and Anaerobic Bioremediation	Electron donors, electron acceptors, nutrients, and possibly microorganisms are injected into the contaminated groundwater to create or enhance aqueous biological activity that degrades the contaminants to less toxic or mineralized compounds requires monitoring.	Not effective for ROCs	Not easily implemented	High O&M cost	<b>Retained</b> – Not effective for ROCs and retained by SulTech, 2007.
		Phytoremediation	Uses plant uptake to remove, transfer, stabilize, and destroy organic/inorganic chemicals in groundwater; requires monitoring to assess remedial progress.				<b>Eliminated</b> – not retained; alternative eliminated in SulTech, 2007.
Removal	Pump and Dispose of Groundwater Contaminants	Pumping	Large volumes of groundwater are pumped from the aquifer to capture the contaminated plume; extracted groundwater is either released to a wastewater disposal facility or is				<b>Eliminated</b> – not retained; alternative eliminated in

**TABLE 4-2**  
**IDENTIFICATION AND SCREENING OF TECHNOLOGY TYPES**  
**AND PROCESS OPTIONS FOR SOIL, GROUNDWATER, AND STRUCTURES**

General Response Action	Remedial Technology Type	Process Option	Description	Effectiveness	Implementability	Cost	Screening Comments
			hauled off site for disposal.				SulTech, 2007.
Containment	Vapor Barriers	Epoxy Coating	The floor of the building is sealed with an epoxy-based sealant, providing a physical barrier to vapor migration into buildings.				<b>Eliminated</b> – not retained; alternative eliminated in SulTech, 2007.
		Sub-slab Depressurization	Blowers and vapor collection points are installed below the building to maintain a negative pressure gradient and prevent vapor intrusion.				<b>Eliminated</b> – not retained; alternative eliminated in SulTech, 2007.
		Raised-floor System	A new floor is installed above the building slab foundation and a depressurization system is installed between the floors to maintain a negative pressure gradient and prevent vapor intrusion.				<b>Eliminated</b> – not retained; alternative eliminated in SulTech, 2007.
<b>STRUCTURES</b>							
No Action	Not Applicable	Not Applicable	No Action	Does not achieve remedial action objectives.	Not acceptable to local government or public.	None	<b>Retained</b> – required by NCP.
Treatment	Removal	Scabbling	Scabbling	Removal of contaminated structural materials with the ROC above RAOs.	Easily implemented.	Moderate cost	<b>Retained</b> – removes specific area contamination.
		Demolition	Demolition	Removal of contaminated building materials with the ROC above RAOs.	Easily implemented.	Moderate cost	<b>Retained</b> – removes large area contamination.
			Off-site Disposal	Disposal of excavated radioactively	Easily	High cost	<b>Retained</b> – effective; quickly

**TABLE 4-2**  
**IDENTIFICATION AND SCREENING OF TECHNOLOGY TYPES**  
**AND PROCESS OPTIONS FOR SOIL, GROUNDWATER, AND STRUCTURES**

General Response Action	Remedial Technology Type	Process Option	Description	Effectiveness	Implementability	Cost	Screening Comments
				contaminated soil and material into a facility licensed to receive low-level radioactive waste.	implemented.		implemented; permanent remedy.
Institutional controls	Institutional controls	Institutional controls	Prohibits activities that could spread contamination by requiring locked and secured access covers where potential receptors could be exposed to the ROCs; requires posted signs and locked doors to prohibit occupancy of existing buildings or other enclosures where there is unacceptable risk from the ROCs.	Effective as long as ICs are in effect	Easy to implement	Low cost	<b>Retained</b> – easily implemented and effective; prevents exposure to ROCs.

***Abbreviations and Acronyms:***

bgs – below ground surface  
 IC – institutional control  
 NCP – National Oil and Hazardous Substances Pollution Contingency Plan  
 O&M – operation and maintenance  
 RAO – Remedial Action Objective  
 ROC – radionuclide of concern  
 ROD – Record of Decision  
 SVE – soil vapor extraction  
 VOC – volatile organic compound

TABLE 4-3

**A SUMMARY OF THE SELECTED GENERAL RESPONSE ACTIONS  
AND PROCESS OPTIONS FOR SOIL, GROUNDWATER, AND STRUCTURES**

General Response Action	Remedial Technology Type	Process Option	Description	Effectiveness	Implementability	Cost	Screening Comments
<b>SOIL</b>							
No Action	Not Applicable	Not Applicable	No Action	Does not achieve remedial action objectives.	Not acceptable to local government or public.	None	<b>Retained</b> – required by NCP.
Institutional Controls	Institutional Controls	Institutional Controls	<p>Fencing, barriers, and posting signs to restrict land use where there is exposure to potentially contaminated soil.</p> <p>Prohibits activities not specified for the designated land use; prohibits growing produce in native soil.</p> <p>Restricts the use of the parcel to those re-uses that are identified at the time the ROD amendment is signed; includes criteria during and after future development to assure that mitigated exposure conditions are maintained such as covers, barriers, or other engineering controls.</p>	Effective at preventing exposure of receptors to contamination, especially when used in combination with other options; does not reduce volume or toxicity of contamination.	Requires legal documents and authority to enforce restrictions. Easily implemented.	Low Cost	<b>Retained</b> – easily implemented and effective, usually required to restrict activity based on land use.

**TABLE 4-3**  
**A SUMMARY OF THE SELECTED GENERAL RESPONSE ACTIONS**  
**AND PROCESS OPTIONS FOR SOIL, GROUNDWATER, AND STRUCTURES**

General Response Action	Remedial Technology Type	Process Option	Description	Effectiveness	Implementability	Cost	Screening Comments
Removal	Excavation	Conventional excavation	Excavation of contaminants, soil, and materials with the ROC concentration above RAOs.	Effective at removing contamination and preventing long-term exposure to contamination; may expose workers and the environment to contaminants during implementation; uses conventional construction methods; proven technology.	Easily implemented for defined areas of contamination; easily implemented for ROCs; may need to excavate to 10 feet bgs.	Moderate cost (based on previous excavations)	<b>Retained</b> – effective for ROCs and quickly implemented; moderate cost.
	Off-site Disposal	Disposal of excavated radioactively contaminated soil and material into a facility licensed to receive low-level radioactive waste.	Transport and disposal of soils at a permitted treatment and disposal facility.	Effective at preventing exposure of receptors to contamination; does not reduce total amount of contamination; may expose workers and environment to contaminants during implementation; conventional method.	Requires appropriate transportation permits and waste characterization. Easily implemented.	High cost	<b>Retained</b> – effective; easily and quickly implemented; permanent remedy; high cost.
Containment	Covers	Soil, Asphalt, or Concrete Cover	Placement of a soil, asphalt, or concrete cover over contaminated soil, prevents contact with contamination.	Effective at preventing exposure of receptors to contamination, must be used with land-use controls to maintain protectiveness, susceptible to weathering and cracking.	Paved areas can be easily maintained using conventional methods; soil or asphalt cover could be used in areas currently unpaved. Easily implemented.	Moderate cost	<b>Retained</b> – for areas that are paved or require paving to achieve planned land uses; can be used with a soil cover.

**TABLE 4-3**  
**A SUMMARY OF THE SELECTED GENERAL RESPONSE ACTIONS**  
**AND PROCESS OPTIONS FOR SOIL, GROUNDWATER, AND STRUCTURES**

General Response Action	Remedial Technology Type	Process Option	Description	Effectiveness	Implementability	Cost	Screening Comments
		Manual screening	Manual screening of excavated soil and material to separate the soil and material exceeding the cleanup standard from the soil below the cleanup standard. This may be accomplished by soil sampling and analyses in the field.	Effective at preventing exposure of receptors to contamination; reduces the total amount of contamination; may expose workers and environment to contaminants during implementation; conventional method.	Requires appropriate equipment, instrumentation, and trained personnel.	High cost	<b>Retained</b> – for fill areas that need to be excavated.
<b>GROUNDWATER</b>							
No Action	Not Applicable	Not Applicable	No Action	Does not achieve RAOs	Not acceptable to local government or public	None	<b>Retained</b> – required by NCP.
Institutional Controls	Not Applicable	Not Applicable	Breaks the exposure pathway if controls are maintained.	Effective as long as institutional controls are maintained.	Easy to implement	Low Cost	<b>Retained</b> -
Treatment	Passive	Monitoring	Groundwater is sampled and analyzed for ROCs; results are evaluated and reported to assess if ROCs are in aquifer and migration of the contaminants to potential exposure points.	Effective for identifying if radionuclides are of concern.	Easy to implement	Moderate Cost	<b>Retained</b> – Identifies if radionuclides are of concern.
<b>STRUCTURES</b>							
No Action	Not Applicable	Not Applicable	No Action	Does not achieve RAOs.	Not acceptable to local government or public	None	<b>Retained</b> – required by NCP.
Treatment	Removal	Scabbling	Scabbling	Removal of contaminated structural materials with the ROC above RAOs.	Easily implemented	Moderate cost	<b>Retained</b> – removes specific area contamination.

**TABLE 4-3**  
**A SUMMARY OF THE SELECTED GENERAL RESPONSE ACTIONS**  
**AND PROCESS OPTIONS FOR SOIL, GROUNDWATER, AND STRUCTURES**

General Response Action	Remedial Technology Type	Process Option	Description	Effectiveness	Implementability	Cost	Screening Comments
		Demolition	Demolition	Removal of contaminated building materials with the ROC above RAOs.	Easily implemented	Moderate cost	<b>Retained</b> – removes large area contamination.
			Off-site Disposal	Disposal of excavated radioactively contaminated soil and material into a facility licensed to receive low-level radioactive waste.	Easily implemented	High cost	<b>Retained</b> – effective; quickly implemented; permanent remedy.

**Abbreviations and Acronyms:**

bgs – below ground surface  
NCP – National Oil and Hazardous Substances Pollution Contingency Plan  
RAO – Remedial Action Objective  
ROC – radionuclide of concern  
ROD – Record of Decision

**TABLE 6-1  
COMPARATIVE ANALYSIS OF ALTERNATIVES SUMMARY**

Alternatives	Overall Protection	ARAR Compliance	Long-term Effectiveness	Reduction of Toxicity, Mobility, Volume through Treatment	Short-term Effectiveness	Implementability	Cost in Addition to Revised FS Report for Parcel C	Overall Rank
<b>SOIL ALTERNATIVES</b>								
S-1: No Action	Not protective	Does not meet ARARs	Not Acceptable	Poor	Very Good	Excellent	Very Good \$0	Not Acceptable
S-2: Institutional Controls	Protective	Meets	Good	Poor	Good	Very Good	Very Good \$0 <sup>a</sup>	Good
S-3: Excavation, Disposal, and Institutional Controls	Protective	Meets	Good	Poor	Good	Very Good	Very Good \$0 <sup>a</sup>	Good
S-4: Covers and Institutional Controls	Protective	Meets	Very Good	Poor	Very Good	Very Good	Very Good \$0 <sup>a</sup>	Very Good
S-5: Excavation, Disposal, Covers, Soil Vapor Extraction, and Institutional Controls	Protective	Meets	Excellent	Poor	Very Good	Good	Very Good \$0 <sup>a</sup>	Excellent
<b>GROUNDWATER ALTERNATIVES</b>								
GW-1: No Action	Not protective	Does not meet ARARs	Not Acceptable	Poor	Very Good	Excellent	Excellent \$0	Not Acceptable
GW-2: Long-Term Groundwater Monitoring and Institutional Controls	Protective	Meets	Poor	Poor	Excellent	Excellent	Good \$1,172,000	Good
GW-3A In-Situ Bioremediation, Long-Term Groundwater	Protective	Meets	Excellent	Excellent	Very Good	Very Good	Good	Very Good

**TABLE 6-1  
COMPARATIVE ANALYSIS OF ALTERNATIVES SUMMARY**

<b>Alternatives</b>	<b>Overall Protection</b>	<b>ARAR Compliance</b>	<b>Long-term Effectiveness</b>	<b>Reduction of Toxicity, Mobility, Volume through Treatment</b>	<b>Short-term Effectiveness</b>	<b>Implementability</b>	<b>Cost in Addition to Revised FS Report for Parcel C</b>	<b>Overall Rank</b>
Monitoring, and Institutional Controls							\$2,281,000	
GW-3B: In-Situ Zero-Valent Reduction, Bioremediation, Long-Term Groundwater Monitoring, and Institutional Controls	Protective	Meets	Excellent	Excellent	Excellent	Very Good	Good \$2,344,000	Very Good
<b>IMPACTED STRUCTURES ALTERNATIVES</b>								
R-1: No Action	Not protective	Does not meet ARARs	Not Acceptable	Poor	Very Good	Very Good	Excellent \$0	Not Acceptable
R-2: Surveys, Decontamination, Disposal, Release, and Institutional Controls	Protective	Meets	Good	Poor	Very Good	Very Good	Good \$28,987,000	Good
R-3: Survey, Decontamination, Disposal, Release, Close In-Place, and Institutional Controls	Protective	Meets	Very Good	Poor	Very Good	Very Good	Good \$29,698,000	Very Good

**Abbreviations and Acronyms:**

ARAR – applicable or relevant and appropriate requirement

**Notes:**

<sup>a</sup> Additional costs for radiological services associated with cleanup of chemicals of concern.

## **FIGURES**

FIGURE ES-1

RANKING OF REMEDIAL ALTERNATIVES FOR SOIL, GROUNDWATER, AND RADIOLOGICALLY-IMPACTED SITES

	Overall Protection of Human Health and the Environment	Compliance with ARARs	Long-Term Effectiveness and Permanence	Reduction of Toxicity, Mobility, or Volume through Treatment	Short-Term Effectiveness	Implementability	Cost (\$ Million)	Overall Rank by Alternative
<b>Soil Alternatives</b>								
Alternative S-1: No Action	Not Protective	Not Applicable	○	○	●	●		○
Alternative S-2: Institutional Controls and Maintained Landscaping	Protective	Meets ARARs	●	●	●	●	0.0 <sup>a</sup>	●
Alternative S-3: Excavation, Disposal, Institutional Controls, and Maintained Landscaping	Protective	Meets ARARs	●	●	●	●	0.0 <sup>a</sup>	●
Alternative S-4: Covers and Institutional Controls	Protective	Meets ARARs	●	●	●	●	0.0 <sup>a</sup>	●
Alternative S-5: Excavation, Disposal, Covers, SVE, and Institutional Controls	Protective	Meets ARARs	●	●	●	●	0.0 <sup>a</sup>	●
<b>Groundwater Alternatives</b>								
Alternative GW-1: No Action	Not Protective	Not Applicable	○	○	●	●	0	○
Alternative GW-2: Long-Term Groundwater Monitoring and Institutional Controls	Protective	Meets ARARs	●	○	●	●	1.2 <sup>a</sup>	●
Alternative GW-3A: In Situ Bioremediation, Long-Term Groundwater Monitoring, and Institutional Controls	Protective	Meets ARARs	●	●	●	●	1.0 <sup>a</sup>	●
Alternative GW-3B: In-Situ ZVI Reduction, Bioremediation, Long-Term Groundwater Monitoring, and Institutional Controls	Protective	Meets ARARs	●	●	●	●	1.3 <sup>a</sup>	●
<b>Remedial Alternatives</b>								
Alternative R-1: No Action	Not Protective	Not Applicable	○	○	●	●	0	○
Alternative R-2: Survey, Decontamination, Disposal, Release, and Institutional Controls	Protective	Meets ARARs	●	○	●	●	27.2	●
Alternative R-3: Survey, Decontamination, Disposal, Release, Close In-Place, and Institutional Controls	Protective	Meets ARARs	●	○	●	●	29.7	●

- Legend
- Not acceptable
  - Poor
  - Good
  - Very Good
  - Excellent

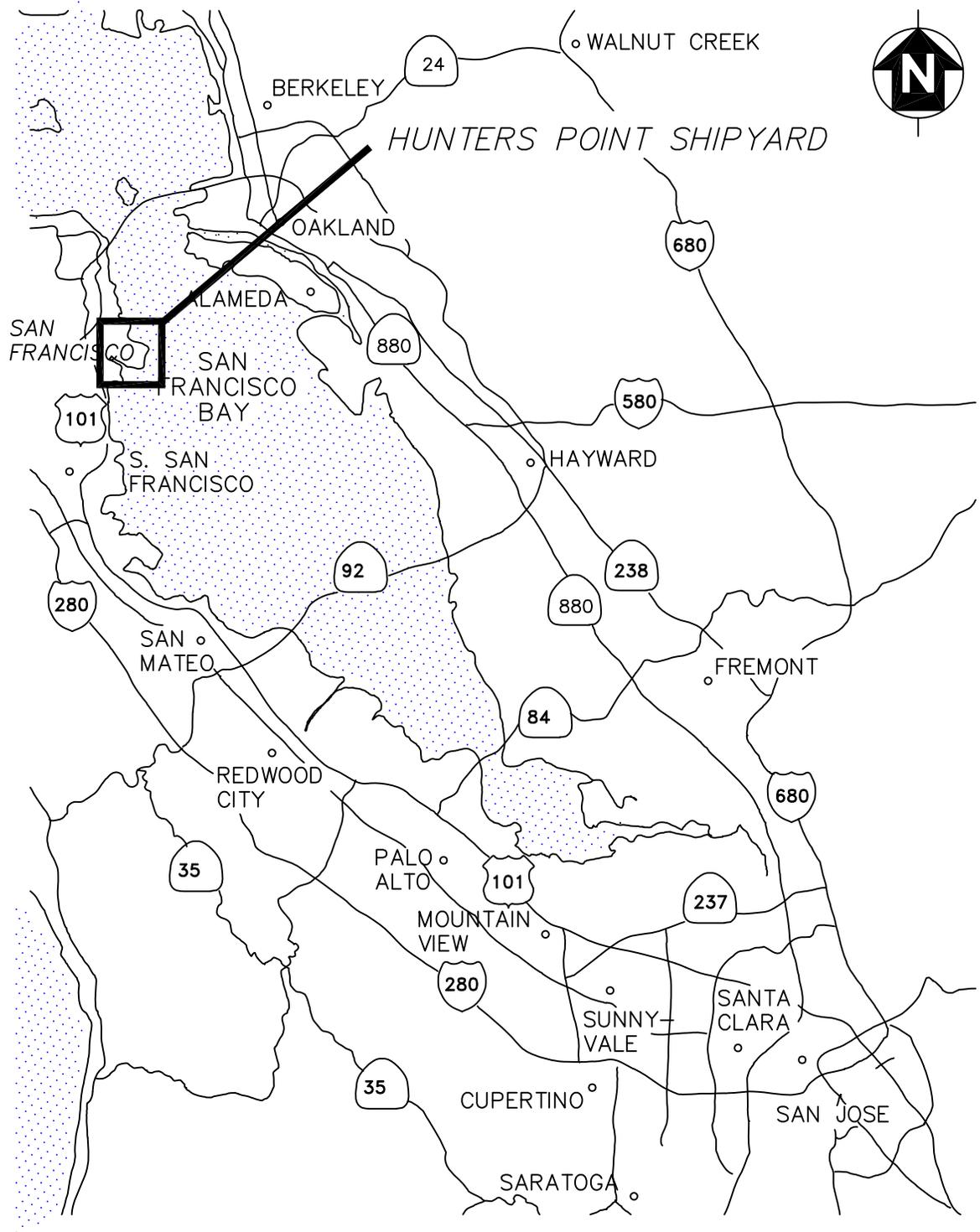
Notes:

<sup>a</sup> Additional cost to the Revised Feasibility Study Report for Parcel C estimated cost for the alternative

Abbreviations and Acronyms:

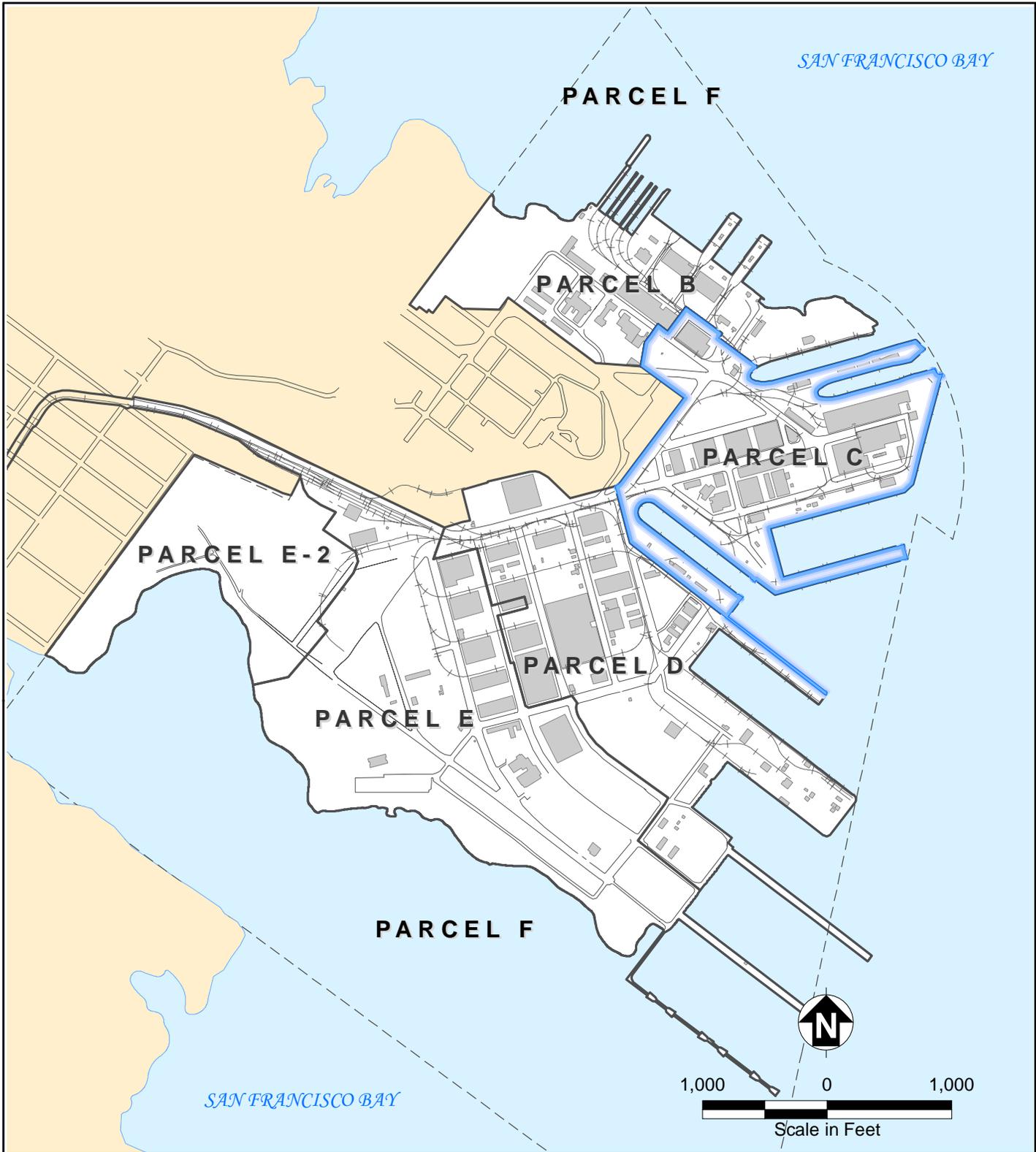
ARAR – applicable or relevant and appropriate requirement  
 SVE – soil vapor extraction  
 ZVI – zero-valent iron

DRAWN BY: RA	CHECKED BY: RA	APPROVED BY: RA	DCN: ECSD.2201.0006.0075	DRAWING NO: Figure 2-1
DATE: 03/11/08	REV:		CTO: 0006	



NOT TO SCALE

**Figure 2-1**  
**HUNTERS POINT LOCATION MAP**  
 DRAFT FINAL RADIOLOGICAL ADDENDUM TO THE  
 REVISED FEASIBILITY STUDY FOR PARCEL C  
 HUNTERS POINT SHIPYARD  
 SAN FRANCISCO, CALIFORNIA  
**TETRA TECH EC**



Location Map

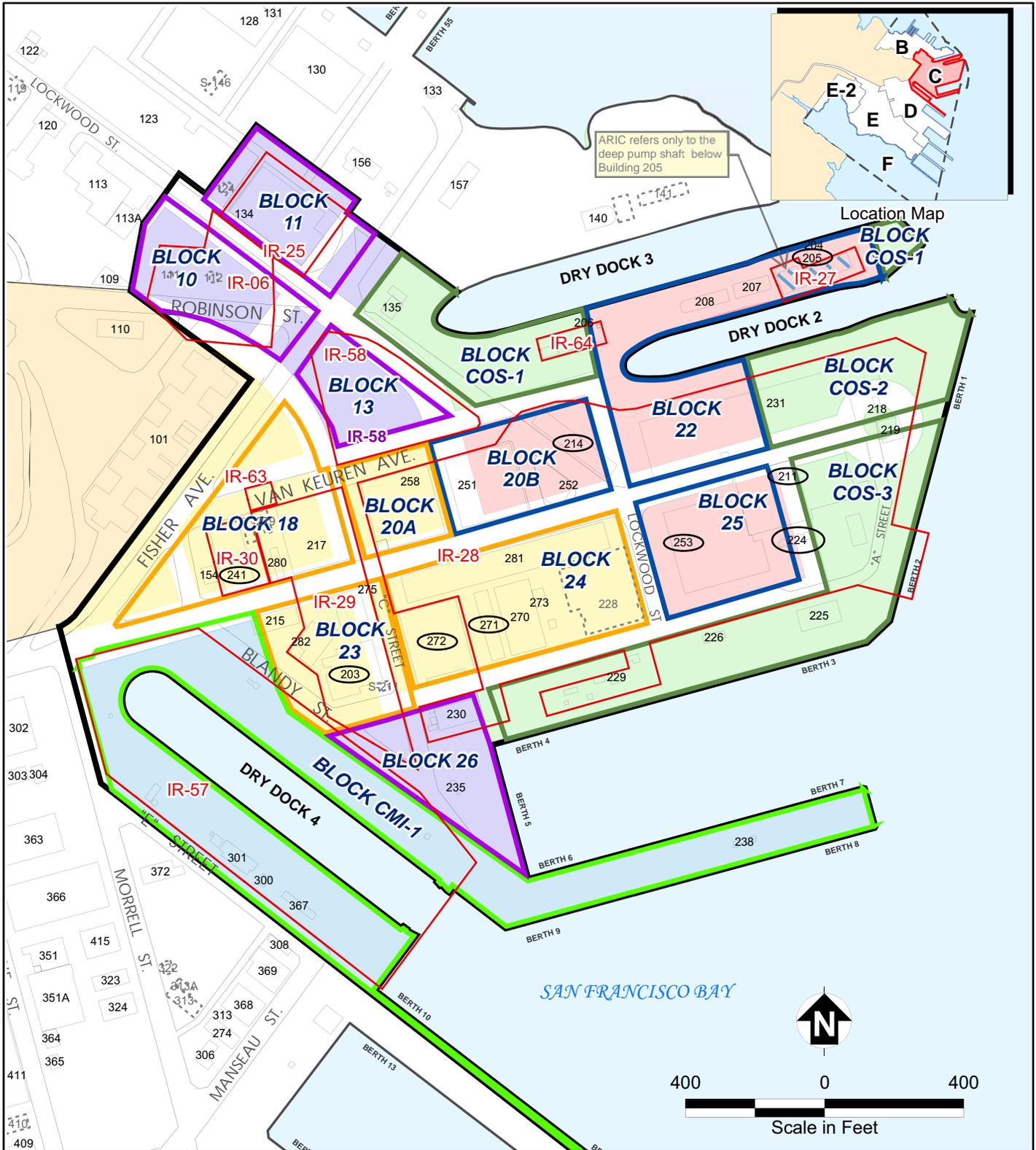
-  Parcel C Boundary
-  Parcel Boundary
-  Parcel F Boundary
-  Non-Navy Property
-  Building
-  Road
-  Rail Line



**Hunters Point Shipyard, San Francisco, California**  
 U.S. Department of the Navy, BRAC PMO West, San Diego, California

**FIGURE 2-2  
 PARCEL C FACILITY  
 LOCATION MAP**

Revised Feasibility Study Report for Parcel C



**Reuse Category**

- Educational/Cultural
- Maritime/Industrial
- Mixed Use
- Open Space
- Research and Development
- Parcel C IR Sites
- Parcel C Boundary
- Non-Navy Property
- Area Likely Requiring ICs

**Redevelopment Block**

- Research and Development
- Mixed Use
- Open Space
- Maritime/Industrial
- Educational/Cultural
- Building
- Demolished Building
- Road
- Radiologically Impacted Buildings

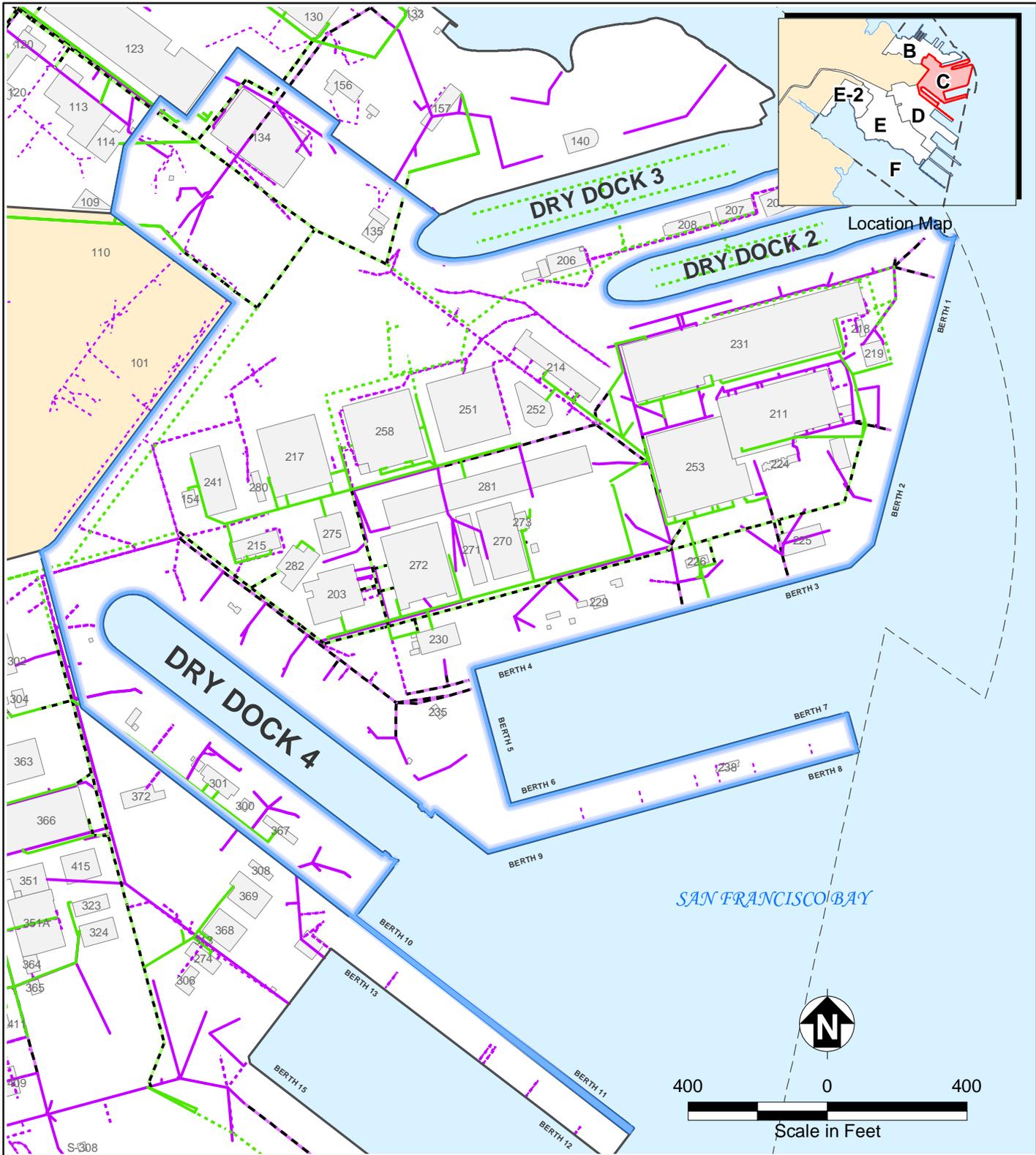
Note: IR - Installation Restoration



Hunters Point Shipyard, San Francisco, California  
 U.S. Department of the Navy, BRAC PMO West, San Diego, California

**FIGURE 2-3  
 Parcel C Impacted Areas,  
 Redevelopment Blocks,  
 and Planned Reuses**

Revised Feasibility Study Report for Parcel C



**Sanitary Sewer Elevation Relative to Groundwater (June 2002)**

- Above Groundwater
- - - Below Groundwater
- · - · - Unknown Elevation

- Parcel C Boundary
- Other Parcel Boundary

**Storm Drain Line Relative to Groundwater (June 2002)**

- Above Groundwater
- - - Below Groundwater
- · - · - Unknown Elevation

- Building
- Parcel F Boundary



Hunters Point Shipyard, San Francisco, California  
 U.S. Department of the Navy, BRAC PMO West, San Diego, California

**FIGURE 2-4  
 PARCEL C STORM DRAIN and  
 SANITARY SEWER LINE MAP**

Revised Feasibility Study Report for Parcel C

**APPENDIX A**

**PARCEL C RADIOLOGICAL  
RISK SCREENING ANALYSIS**

**Base Realignment and Closure  
Program Management Office West  
1455 Frazee Road, Suite 900  
San Diego, California 92108-4310  
CONTRACT NO. N62473-06-D-2201  
CTO No. 0006**

**APPENDIX A  
FINAL  
PARCEL C RADIOLOGICAL  
RISK SCREENING ANALYSIS  
June 20, 2008**

**PARCEL C, HUNTERS POINT SHIPYARD  
SAN FRANCISCO, CALIFORNIA**

**DCN: ECSD-2201-0006-0077**



**TETRA TECH EC, INC.  
1230 Columbia Street, Suite 750  
San Diego, CA 92101-8536**

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## **ATTACHMENTS**

Attachment 1	RESRAD Modeling (available on CD only)
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## ABBREVIATIONS AND ACRONYMS

AEC	Atomic Energy Commission
cm <sup>2</sup>	square centimeter
<sup>60</sup> Co	cobalt-60
<sup>137</sup> Cs	cesium-137
CSM	Conceptual Site Model
DOD	Department of Defense
DON	Department of Navy
DTSC	Department of Toxic Substances Control
dpm	disintegration per minute
EPA	U.S. Environmental Protection Agency
FS	Feasibility Study
HPS	Hunters Point Shipyard
IR	Installation Restoration
NCRP	National Council on Radiation Protection
NRC	Nuclear Regulatory Commission
NUREG	U.S. Nuclear Regulatory Commission Regulation
pCi/g	picocurie per gram
<sup>239</sup> Pu	plutonium-239
<sup>226</sup> Ra	radium-226
RESRAD	Residual Radioactivity (Model)
RESRAD-BUILD	Residual Radioactivity – Building (Model)
ROC	radionuclide of concern
<sup>90</sup> Sr	strontium-90
<sup>232</sup> Th	thorium-232

## 1.0 PURPOSE

The Department of the Navy (DON), U.S. Environmental Protection Agency (EPA), and Department of Toxic Substances Control (DTSC) held a number of focused meetings in 2004 and agreed upon risk assessment methodologies for soil and groundwater that were used for the human-health risk-assessment in the Revised Feasibility Study (FS) Report for Parcel C (SulTech, 2007). These methodologies were applied to the analyses discussed in this appendix.

This appendix presents the methodology and evaluations used to estimate the dose and risk to future Parcel C residents and construction workers. The objectives of this appendix are to:

- Identify the critical exposure pathways and radiological contaminants that pose primary health concerns
- Identify the exposure pathways and radiological contaminants that pose little or no threat to human health
- Estimate the potential dose and risks to human health due to radiological contaminants associated with potential future land-use scenarios.

The remainder of this appendix is organized as follows:

- Section 2.0 presents an overview of the methodology used for the risk analysis.
- Section 3.0 discusses the conceptual site model for Parcel C.
- Section 4.0 identifies the radionuclides of concern (ROC).
- Section 5.0 presents the exposure assessment.
- Section 6.0 presents the uncertainty analysis.
- Section 7.0 presents the references used for this analysis.

Tables, figures, and attachments are presented after Section 7.0.

## 2.0 RADIOLOGICAL RISK ASSESSMENT METHODOLOGY

The computer codes Residual Radioactive (RESRAD) (Department of Defense [DOD], et al., 2000) and RESRAD-BUILD (Nuclear Regulatory Commission [NRC], 2000) were used to perform dose and risk modeling for radiologically-impacted sites at Parcel C. RESRAD-BUILD was used to model the impacted buildings (i.e., 203, 205 and discharge channel, 211, 214, 224, 241, 253, 271, and 272). RESRAD was used to model the risk associated with impacted land areas (e.g., soils of remediated storm water and sanitary sewers). Both RESRAD and RESRAD-BUILD use the isotopes specified as radionuclides of interest and automatically include the long-lived daughter products of these isotopes.

RESRAD and RESRAD-BUILD were used to analyze the exposure scenarios that match planned reuse (San Francisco Redevelopment Agency, 1997). The majority of the input parameters for both RESRAD and RESRAD-BUILD were left as default except where noted. Since the only impacted land areas were the Parcel C storm water and sanitary sewer systems, it is not appropriate to assign a reuse scenario to these areas. Therefore all RESRAD calculations were run using the bounding residential scenario. Similarly by convention, the RESRAD-BUILD results were run with a bounding residential scenario as established by previous Hunters Point Shipyard (HPS) radiological feasibility analyses.

### 2.1 RESRAD

The RESRAD (NRC, 2000) code is used to estimate the potential risk to an individual from exposure to residual radionuclides in soil or soil-like media. It was used to evaluate the risk associated with impacted storm water and sanitary sewer systems in Parcel C.

The goal of the RESRAD risk modeling approach was to be as consistent as possible with assumptions and inputs used in the Revised FS Report for Parcel C (SulTech, 2007) non-radiological human health risk assessment.

### 2.2 RESRAD-BUILD

RESRAD-BUILD (NRC, 2000) is a modeling code used to estimate the potential radiological risk to an individual who works or lives in a building with residual radioactive material. It was used to evaluate the risk associated with occupying Parcel C radiologically-impacted buildings. The focus of this modeling effort was to estimate the increased cancer risk associated with any residual radioactive material left in the buildings after the buildings have been surveyed and released. Residual radioactive material is defined as any radioactive material below the residual cleanup goals. RESRAD-BUILD is similar to RESRAD in that the user can construct the exposure scenario by adjusting the input parameters. Typical building exposure scenarios include long-term occupancy (residential and industrial) and short-term occupancy (recreational and construction). The estimated dose can be the total (individual) dose to a single receptor spending time at various

locations or the total (collective) dose to a workforce decontaminating the building. For purposes of these analyses, RESRAD-BUILD was run in individual dose mode.

RESRAD-BUILD has several input parameters grouped into the categories of building, source, and receptor. Using RESRAD-BUILD, buildings can be modeled as one-, two- or three-room structures. For simplicity of modeling, the impacted buildings in Parcel C were modeled as a single-room structure with a default interior height of 2.5 meters. A room area of 100 square meters (m<sup>2</sup>) was selected to be representative of a typical survey unit size. The source for each building was modeled as an area source that covered the complete floor area of the building, based on the assumption that the residual radioactive material would be uniformly distributed over the floor surface. The source activity was from the ROCs at the remediation goals. Receptor inputs were taken as the default values and the receptor was located in the middle of the building. All other building parameters used the default input values.

## **3.0 CONCEPTUAL SITE MODEL**

This section presents the conceptual site model (CSM) for the Parcel C radiological risk analysis. The CSM provides a summary of the sources of the radionuclide contaminants on site and presents the affected environmental media. Additionally, the potential receptors and pathways through which receptors may receive radiological dose are noted. The CSM for Parcel C is presented in Figure A.3-1. This figure identifies which computer code was used to model the risk to the indicated receptor by the designated pathway. Radiological pathways that are not active for this analysis are excluded from the CSM.

### **3.1 SOURCES OF SITE CONTAMINANTS**

Details on the historical activities at Parcel C contributing to the existing radiological contamination are presented in Section 2.1.2 of the Radiological Addendum to the Revised FS Report for Parcel C.

### **3.2 AFFECTED ENVIRONMENTAL MEDIA**

Historical Parcel C activities may have introduced radioactive contaminants to land areas and buildings. Radiologically impacted land areas are limited to the Parcel C storm water and sanitary sewer systems. Contaminated media in the form of discrete radioactive sources as well as distributed contamination from leaks or spills of radioactive material are potentially present within Parcel C, although there are presently no known radiologically-impacted soil areas. Contamination of building surfaces and existing concrete and asphalt resulting from leaks, spills, and process wastes also is potentially present.

### **3.3 POTENTIALLY EXPOSED RECEPTORS**

The 1997 redevelopment plan identifies planned reuses for the entire Parcel C area. Table A.3-1 shows the radiologically-impacted areas of Parcel C, the planned reuse, and the associated exposure scenario for the planned reuse.

The exposure scenario establishes the receptor parameters to be modeled. The potential receptors considered for evaluation were selected to be consistent with the human health risk assessment provided in the Revised FS Report for Parcel C (SulTech, 2007) and are as follows:

- Resident (adult and child)
- Industrial worker (adult)
- Recreational user (adult and child)
- Construction worker (adult)

Although the chemically contaminated land areas in Parcel C fall into the residential, industrial, and recreational exposure scenarios, radiologically-impacted land areas are limited to the storm water and sanitary sewer systems and associated surrounding soil. Thus only a bounding residential scenario was modeled in RESRAD.

### **3.4 EXPOSURE PATHWAYS**

As discussed in the human health risk assessment in the Revised FS Report for Parcel C (SulTech, 2007), a complete exposure pathway consists of four elements as follows:

- A source and mechanism of release.
- A retention or transport medium (or media in cases involving transfer of radionuclides).
- A point of potential human contact with the contaminated medium (referred to as the exposure point).
- An exposure route (such as ingestion) at the contact point.

The CSM is shown in Figure A.3-1. If any of these elements is missing (except in a case where the source itself is the point of exposure), then the exposure pathway is considered incomplete. For example, if receptor contact with the source or transport medium does not occur, then the exposure pathway is incomplete and is not quantitatively evaluated for risk. Similarly, if human contact with an exposure medium is not possible, the exposure pathway is considered incomplete and is not evaluated.

For the potentially contaminated building surfaces the exposure pathways are external radiation from contaminated surfaces and inhalation of re-suspended contaminated dust.

The exposure pathways for soils at Parcel C (associated with removal of the storm water and sanitary sewer systems) present a more complicated analysis. The complete pathways, based on the four criteria listed above, are external radiation, contaminant ingestion, and contaminant inhalation.

#### **3.4.1 External Radiation Pathway**

The external radiation pathway is identified as potentially complete. Exposure to external radiation is the result of radiation emanating from radionuclides present in any contaminated media.

#### **3.4.2 Contaminant Ingestion Pathway**

The soil ingestion pathway is identified as potentially complete. This pathway corresponds to direct ingestion of radioactive contaminants in a solid medium.

### **3.4.3 Inhalation Pathway**

The inhalation pathway is identified as potentially complete. This pathway corresponds to inhalation of radiologically contaminated particles.

### **3.4.4 Drinking Water Ingestion Pathway**

The drinking water ingestion pathway is not identified as a complete pathway for all receptors. Evaluations of the A-aquifer and the B-aquifer suggest that these aquifers should not be considered a potential source of drinking water. However, the exposure pathway associated with residential use of groundwater in the B-aquifer was included in the Revised FS Report for Parcel C (SulTech, 2007) because of agreements with the Base Closure Team on the human health risk assessment methodology.

## 4.0 RADIONUCLIDES OF CONCERN

Table A.4-1 identifies the ROCs for Parcel C, which includes (cesium-137 [ $^{137}\text{Cs}$ ], cobalt-60 [ $^{60}\text{Co}$ ], plutonium-239 [ $^{239}\text{Pu}$ ], radium-226 [ $^{226}\text{Ra}$ ], strontium-90 [ $^{90}\text{Sr}$ ] and thorium-232 [ $^{232}\text{Th}$ ]). Typically there is no background radioactivity associated with building materials, with the exception of building material made from earthen media (e.g., tiles, concrete, stone, etc.). To simplify the RESRAD-BUILD evaluations being performed, it is assumed that the impacted buildings in Parcel C do not have materials of construction with elevated naturally occurring levels of radioactivity. For simplification in RESRAD, it is assumed that all soil ROCs are present at each site being modeled. While this may add extra ROCs to certain areas, it ensures that the results presented in this analysis conservatively bound the anticipated scenarios.

## 5.0 EXPOSURE ASSESSMENT

The Revised FS Report for Parcel C (SulTech, 2007) provides both total and incremental risk associated with chemical contaminants. To combine the chemical risk and radiological risk, the same approach used in the Revised FS Report for Parcel C to calculate chemical risk was taken, namely, calculating total risk from ROCs inclusive of background and calculating incremental risk from the ROCs present at levels that do not include background. Of the ROCs for Parcel C, only  $^{226}\text{Ra}$  is naturally occurring. Both  $^{137}\text{Cs}$  and  $^{90}\text{Sr}$  may be present in trace quantities because of fallout resulting from atmospheric nuclear weapons testing and radiological accidents, such as Chernobyl. For the purposes of the radiological modeling effort, the background concentration for the ROCs other than  $^{226}\text{Ra}$  are assumed to be essentially zero (i.e., zero picocurie per gram [pCi/g]). The  $^{226}\text{Ra}$  background concentration is assumed to be the measured background level of 0.485 pCi/g based on the background reference areas used to support the Parcel B storm water and sanitary sewer system removal action. This value has been rounded to 0.5 pCi/g for modeling purposes.

To estimate the total risk from radiologically-impacted buildings, the background concentration of the ROCs is assumed to be zero (i.e., zero disintegration per minute [dpm]/100 square centimeters [ $\text{cm}^2$ ]). This is a reasonable assumption since none of the ROCs are found in building materials except  $^{226}\text{Ra}$ , which can be found in building materials made of earthen materials (i.e., cement, ceramic tiles). However, as a conservative modeling measure, the background concentration of  $^{226}\text{Ra}$  in building materials is also assumed to be zero.

The risks associated with impacted sites at Parcel C are presented in this section. Summary dose and risk reports for RESRAD and RESRAD-BUILD calculations are provided on CD as Attachment 1 to this appendix.

### 5.1 RESRAD-BUILD

To estimate the total risk from radiologically-impacted buildings the background concentration of the ROCs is assumed to be zero (e.g., zero dpm/100  $\text{cm}^2$ ). This is a reasonable assumption since none of the ROCs are found in building materials except  $^{226}\text{Ra}$ , which can be found in building material made of earthen materials (i.e., cement, ceramic tiles) resulting in a negligible risk associated with radioactive constituents in building materials. Therefore, the total dose and risk are equivalent to the incremental dose and risk. To estimate the incremental dose and risk from radiologically-impacted buildings, the ROCs are assumed to be at the residual cleanup goal surface concentrations listed in Table A.4-1. For each impacted building, a single case was run to estimate the dose and risk. In cases where buildings had identical ROCs as another building a single run was made to cover all buildings with the same list of ROCs. Multiple runs were not necessary to identify the critical exposure scenario (i.e., the scenario that presents the greatest risk) because occupancy time is the primary driver for the calculated risk: as occupancy time

increases, so does the associated risk. Therefore, the resident scenario is the critical scenario providing the greatest risk estimate. The RESRAD-BUILD results are presented in Table A.5-1.

The combined total risk and incremental risk (chemical and radiological) were derived by reviewing the Revised FS Report for Parcel C (SulTech, 2007) and locating grid points in close proximity to the impacted building. The risk for the impacted buildings estimated from RESRAD-BUILD and the Revised FS Report for Parcel C are presented in Table A.5-2.

## 5.2 RESRAD

To estimate the total risk from the impacted Parcel C storm water and sanitary sewer system, the background concentrations of the ROCs other than  $^{226}\text{Ra}$  were assumed to be essentially zero (e.g., zero pCi/g). As explained in NCRP Report 45, naturally radioactive material could be found in man-made building materials (NCRP-45, 1975). The  $^{226}\text{Ra}$  background concentration is assumed to be the measured 0.5 pCi/g background level. Table A.5-3 presents the total dose and risk from the impacted Parcel C storm water and sanitary sewer system estimated using RESRAD.

To estimate the incremental risk from the impacted storm water and sanitary sewer system, the ROCs are assumed to be present at equivalent fractions of the representative remediation goals listed in Table A.4-1 such that the sum of the fractions does not exceed one (i.e., the unity rule). The incremental dose and risk for the storm water and sanitary sewer system estimated from RESRAD are presented in Table A.5-3.

The combined total risk and incremental risk (chemical and radiological) were derived by reviewing the Revised FS Report for Parcel C (SulTech, 2007) and locating grid points in close proximity to the impacted storm water and sanitary sewer system. Chemical and radiological risks were added to yield the combined risk. The risk for the storm water and sanitary sewer system estimated from RESRAD and the Revised FS Report for Parcel C are presented in Table A.5-4.

### 5.2.1 Critical Pathway Evaluation

A formal critical pathway evaluation was not performed because the only impacted land areas are those associated with the Parcel C storm water and sanitary sewer system. These areas will be limited in size and it is thus not appropriate to consider reuse scenarios for such small areas. Based upon previous modeling from prior radiological feasibility study work at HPS, the external radiation pathway has been shown to be the most dominant pathway. While the drinking water pathway is not considered a realistic pathway (due to the unsuitability of the subsurface water at HPS for drinking water use) analyses performed for this appendix have shown that drinking water effects do not contribute significantly to the dose or risk until several hundred years beyond the turnover of the property.

## 6.0 UNCERTAINTY ANALYSIS

Any comprehensive risk analysis must consider the effects of uncertainty on input parameters. This analysis is no different; however, rather than perform explicit uncertainty analyses that would have required countless additional RESRAD runs, an approach was taken that minimized the need for additional modeling computations. U.S. Nuclear Regulatory Commission Regulation NUREG-6697 (NRC, 2000) was used as the basis for the uncertainty analysis.

One of the primary purposes of NUREG-6697 was to study the effect of various parameter distributions on the final results of RESRAD analyses. As part of the NUREG study, multiple RESRAD runs were conducted for selected isotopes while varying a single parameter.

Since the isotopes included in the NUREG-6697 study cover the majority of the ROCs at HPS, it was determined that the conclusions of the NUREG-6697 study could be used as the basis for the uncertainty analysis for the modeling done as part of the Revised FS Report for Parcel C Addendum. The uncertainty considerations for each ROC are discussed separately below.

### Strontium-90

The most critical parameter affecting dose and subsequent risk from  $^{90}\text{Sr}$  used in these analyses is the contaminated zone thickness. No other parameters used in this analysis had the potential to have any substantial impact on the results. As previously mentioned, the contaminated zone was dependent on the particular scenario being modeled. In all cases, however, the thickness was selected to be very conservative, and it is fully expected that the results presented in this analysis bound the actual case. It is therefore concluded that the conservatism built into this analysis eliminates the need to run additional uncertainty cases for  $^{90}\text{Sr}$ .

### Cesium-137

Dose and subsequent risk due to  $^{137}\text{Cs}$  is primarily due to the external radiation pathway. The density and thickness of the cover material are the key parameters used in the RESRAD analysis that affect the risk associated with  $^{137}\text{Cs}$ . Changes to the external gamma shielding factor also can affect the results to a lesser extent.

The RESRAD default cover material density was used for all analyses performed. The default was designed to be representative of the body of soil types. In some cases, an asphalt cover was modeled with the same default soil density. In reality, asphalt would have a greater density than the default soil value. The specific density is dependent upon the asphalt-laying process. By underestimating the density of asphalt, a certain measure of conservatism has been built into the results presented in this document. It is therefore reasonable to assume that any uncertainty associated with the cover material density is minimal and a full uncertainty analysis for a range of cover material densities is not necessary.

The selected cover thicknesses were selected based upon information in the Revised FS Report for Parcel C (SulTech, 2007) and are consistent with average modern practices for site preparation. No additional runs are required to evaluate the uncertainty with this parameter.

The external gamma-shielding factor is a measure of how much shielding is offered by the building structures for a site receptor. This analysis used the RESRAD default value; however, since all receptor time was assumed inside the value selected for the gamma-shielding factor has no bearing on the final results. No explicit uncertainty analysis was performed for this parameter.

### **Radium-226**

<sup>226</sup>Ra is another nuclide with the majority of dose (for this analysis) resulting from the external radiation pathway. <sup>226</sup>Ra has a relatively long half-life of 1,600 years. Due to its longevity, the most important parameters affecting dose from <sup>226</sup>Ra in order from highest to lowest are thickness and density of the contaminated zone.

As noted for <sup>90</sup>Sr, the contaminated zone thickness has conservatism built in and thus does not require further uncertainty analysis. The density of the contaminated zone was modeled as the RESRAD default. All RESRAD default values are selected to provide conservative but reasonable estimates to a wider range of analyses. There is no added benefit to conducting more detailed uncertainty calculations for the <sup>226</sup>Ra dose-based risk with varying contaminated zone densities.

### **Plutonium-239**

<sup>239</sup>Pu with a 24,000-year half-life has the contaminated zone thickness as the most influential parameter for <sup>239</sup>Pu dose in these analyses. The variability in results due to changes in this parameter is far greater than any other parameters. Since the previous discussions have established that the contaminated zone thickness has substantial conservatism included in it, there is no need to perform additional uncertainty calculations.

### **Thorium-232**

Although <sup>232</sup>Th was not directly studied by NUREG/CR-6697, <sup>232</sup>Th was included in the study. For purposes of this analysis it is assumed that <sup>230</sup>Th and <sup>232</sup>Th would behave similarly. Thorium-232 has an extremely long half-life on the order of 14 billion years. Its primary contribution to dose is through the external pathway although the groundwater pathway becomes increasingly more important at longer times. It is unknown if the groundwater pathway surpasses direct exposure at some point since this analysis was only modeled out to 1000 years. Thickness of the contaminated zone is the most sensitive parameter for thorium. As noted above, conservatism has been used in selecting the contaminated zone thickness thus no additional uncertainty studies were necessary for <sup>232</sup>Th. Furthermore the fact that the groundwater on

Parcel C is not considered a viable source of drinking water further limits the impacts of uncertainty in the  $^{232}\text{Th}$  concentration.

## 7.0 REFERENCES

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Department of Defense (DoD), Department of Energy (DOE), Nuclear Regulatory Commission (NRC), and U.S. Environmental Protection Agency (EPA). 2000. *Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)*. NUREG-1575.

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Nuclear Regulatory Commission (NRC). 2000. *Development of Probabilistic RESRAD 6.0 and RESRAD-BUILD 3.0 Computer Codes*. NUREG/CR-6697. Office of Nuclear Regulatory Research Radiation Protection, Environmental Risk and Waste Management Branch.

San Francisco Redevelopment Agency. 1997. *Hunters Point Shipyard Redevelopment Plan*. July 14.

SulTech. 2007. Revised Feasibility Study Report for Parcel C. SulTech: 1230 Columbia Street, Suite 1000, SD, CA. September 17.

## **TABLES**

**TABLE A.3-1**  
**SITES AND SELECTED PARAMETERS FOR REVISED FEASIBILITY STUDY**  
**REPORT FOR PARCEL C RADIOLOGICAL ANALYSIS**

<b>Building/ Site Number</b>	<b>Impacted Redevelopment Block<sup>a</sup></b>	<b>Planned Reuse</b>	<b>Reuse Scenario</b>
203	23	Educational/Cultural	Industrial
205 and discharge channel	22	Educational/Cultural	Industrial
211	25 and COS-3	Educational/Cultural and Open Space	Industrial
214	20B	Educational/Cultural	Industrial
224	25	Educational/Cultural	Industrial
241	18	Research and Development	Residential
253	25	Educational/Cultural	Industrial
271	24	Research and Development	Residential
272	24	Research and Development	Residential
Storm Water Sewer System	All Blocks	Educational/Cultural, Mixed Use, Research and Development, Open Space	Residential
Sanitary Sewer System	All Blocks	Educational/Cultural, Mixed Use, Research and Development, Open Space	Residential

**Notes:**

COS – Parcel C Open Space

<sup>a</sup> Not all redevelopment blocks are listed since there are no radiologically-impacted buildings in some of the Parcel C Redevelopment Blocks.

**TABLE A.4-1**  
**RESIDUAL CLEANUP GOALS**

Radionuclides of Concern	Surfaces (dpm/100 cm <sup>2</sup> )		Soil <sup>c</sup> (pCi/g)	
	Equipment, Waste <sup>a</sup>	Structures <sup>b</sup>	Outdoor Worker <sup>d</sup>	Residential <sup>d</sup>
Cesium-137	5,000	5,000	0.113	0.113
Cobalt-60	5,000	5,000	0.0602	0.0361
Plutonium-239	100	100	14.0	2.59
Radium-226	100	100	1.0 <sup>e</sup>	1.0 <sup>e</sup>
Strontium-90	1,000	1,000	10.8	0.331
Thorium-232	1,000	36.5	2.7	1.69

**Notes:**

- <sup>a</sup> These limits are based on AEC *Regulatory Guide 1.86* (1974). Limits for removable surface activity are 20 percent of these values.
- <sup>b</sup> These limits are based on 25 mrem/y, using Decontamination and Decommissioning Version 2 or *Regulatory Guide 1.86*, whichever is lower.
- <sup>c</sup> EPA PRGs for two future-use scenarios.
- <sup>d</sup> The on-site and off-site laboratory will ensure that the MDA meets the listed release criteria by increasing sample size or counting time as necessary. The MDA is defined as the lowest net response level, in counts, that can be seen with a fixed level of certainty, customarily 95 percent. The MDA is calculated per sample by considering background counts, amount of sample used, and counting time.
- <sup>e</sup> Limit is 1 pCi/g above background; not to exceed 2 pCi/g total, per agreement with EPA.

**Abbreviations and Acronyms:**

AEC	– Atomic Energy Commission
cm <sup>2</sup>	– square centimeter
dpm	– disintegration per minute
EPA	– U.S. Environmental Protection Agency
MDA	– minimum detectable activity
mrem/y	– millirem per year
pCi/g	– picocurie per gram
PRG	– Preliminary Remediation Goal

**TABLE A.5-1**  
**RESRAD-BUILD RESULTS<sup>a</sup>**

<b>Parcel C Impacted Sites</b>	<b>Radiological Risk<sup>b</sup></b>	<b>Dose<sup>c,d</sup></b>
203	1.44 x 10 <sup>-6</sup>	5.43
205 and Discharge Channel	1.44 x 10 <sup>-6</sup>	5.43
211	1.30 x 10 <sup>-6</sup>	9.29
214	1.44 x 10 <sup>-6</sup>	5.43
224	1.48 x 10 <sup>-6</sup>	7.02
241	8.70 x 10 <sup>-7</sup>	12.8
253	1.29 x 10 <sup>-6</sup>	9.32
271	1.34 x 10 <sup>-6</sup>	0.64
272	3.09 x 10 <sup>-6</sup>	3.66

**Notes:**

- <sup>a</sup> Total risk and dose is equivalent to incremental risk and dose  
<sup>b</sup> Total excess lifetime carcinogen risk  
<sup>c</sup> millirem per year  
<sup>d</sup> Dose is calculated using DCGLs. Actual dose will be determined after remediation.

TABLE A.5-2

## COMBINED RISK FOR RADIOLOGICALLY-IMPACTED BUILDINGS

Combined Total Risk			
Parcel C Impacted Sites	Radiological Risk <sup>a</sup>	Chemical Risk <sup>bc</sup>	Combined Risk
203	$1.44 \times 10^{-6}$	$5.00 \times 10^{-4}$	$5.01 \times 10^{-4}$
205 and Discharge Channel	$1.44 \times 10^{-6}$	$4.00 \times 10^{-6}$	$5.40 \times 10^{-6}$
211	$1.30 \times 10^{-6}$	$5.00 \times 10^{-5}$	$5.13 \times 10^{-5}$
214	$1.44 \times 10^{-6}$	$5.00 \times 10^{-5}$	$5.14 \times 10^{-5}$
224	$1.48 \times 10^{-6}$	$4.00 \times 10^{-5}$	$4.14 \times 10^{-5}$
241	$8.70 \times 10^{-7}$	$4.00 \times 10^{-4}$	$4.00 \times 10^{-4}$
253	$1.29 \times 10^{-6}$	$4.00 \times 10^{-4}$	$4.01 \times 10^{-4}$
271	$1.34 \times 10^{-6}$	$4.00 \times 10^{-4}$	$4.01 \times 10^{-4}$
272	$3.09 \times 10^{-6}$	$2.00 \times 10^{-3}$	$2.00 \times 10^{-3}$
Combined Incremental Risk			
Parcel C Impacted Sites	Radiological Risk <sup>a</sup>	Chemical Risk <sup>bc</sup>	Combined Risk
203	$1.44 \times 10^{-6}$	$5.00 \times 10^{-4}$	$5.01 \times 10^{-4}$
205 and Discharge Channel	$1.44 \times 10^{-6}$	$6.00 \times 10^{-7}$	$2.0 \times 10^{-6}$
211	$1.3 \times 10^{-6}$	$5.00 \times 10^{-5}$	$5.13 \times 10^{-5}$
214	$1.44 \times 10^{-6}$	$5.00 \times 10^{-5}$	$5.14 \times 10^{-5}$
224	$1.48 \times 10^{-6}$	$3.00 \times 10^{-5}$	$3.14 \times 10^{-5}$
241	$8.7 \times 10^{-7}$	$4.00 \times 10^{-4}$	$4.00 \times 10^{-4}$
253	$1.29 \times 10^{-6}$	$4.00 \times 10^{-5}$	$4.12 \times 10^{-5}$
271	$1.34 \times 10^{-6}$	$4.00 \times 10^{-4}$	$4.01 \times 10^{-4}$
272	$3.09 \times 10^{-6}$	$2.00 \times 10^{-3}$	$2.00 \times 10^{-3}$

**Notes:**

- <sup>a</sup> Total excess lifetime carcinogen risk
- <sup>b</sup> Chemical risk was taken from Revised Feasibility Study Report for Parcel C Tables 3-2 and 3-3 (SulTech, 2007)
- <sup>c</sup> The worst case chemical risk was chosen from the grids that the radiologically-impacted buildings overlay.

**TABLE A.5-3**  
**RESRAD RESULTS**

<b>Total Dose and Risk</b>		
<b>Impacted Soil Areas</b>	<b>Radiological Risk<sup>a</sup></b>	<b>Dose<sup>b</sup></b>
Storm Water and Sanitary Sewer System	$6.75 \times 10^{-5}$	3.09
<b>Incremental Dose and Risk</b>		
<b>Impacted Soil Areas</b>	<b>Radiological Risk<sup>a</sup></b>	<b>Dose<sup>b</sup></b>
Storm Water and Sanitary Sewer System	$4.54 \times 10^{-5}$	2.08

**Notes:**

- <sup>a</sup> Total excess lifetime carcinogen risk  
<sup>b</sup> millirem per year  
<sup>c</sup> Dose is calculated using DCGLs. Actual dose will be determined after remediation.

**TABLE A.5-4****COMBINED RISK FOR RADIOLOGICALLY-IMPACTED STORM WATER AND  
SANITARY SEWER SYSTEM**

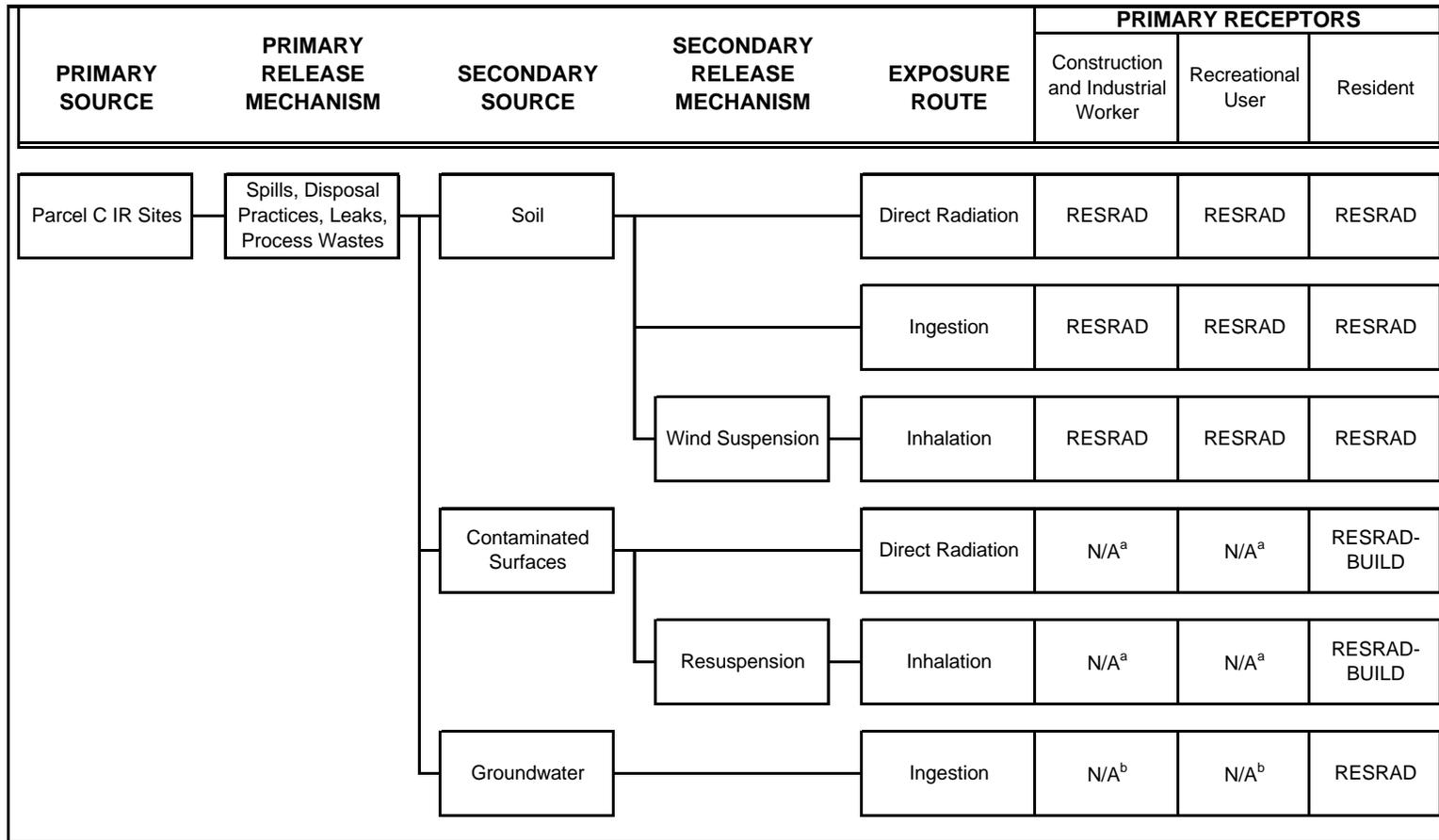
<b>Combined Total Risk</b>			
<b>Parcel C Impacted Sites</b>	<b>Radiological Risk<sup>a</sup></b>	<b>Chemical Risk<sup>bd</sup></b>	<b>Combined Risk</b>
Storm Water and Sanitary Sewer System	$6.75 \times 10^{-5}$	$2.00 \times 10^{-3}$	$2.07 \times 10^{-3}$
<b>Combined Incremental Risk</b>			
<b>Parcel C Impacted Sites</b>	<b>Radiological Risk<sup>a</sup></b>	<b>Chemical Risk<sup>cv</sup></b>	<b>Combined Risk</b>
Storm Water and Sanitary Sewer System	$6.75 \times 10^{-5}$	$2.00 \times 10^{-3}$	$2.07 \times 10^{-3}$

**Notes:**

- a Total excess lifetime carcinogen risk from RESRAD runs (Attachment 1)
- b Chemical total risk was taken from Revised Feasibility Study Report for Parcel C, Tables 3-2 and 3-3
- c Chemical incremental risk was taken from Revised Feasibility Study for Parcel C, Tables 3-8 and 3-9
- d The worst case chemical risk was chosen for the grids that radiologically-impacted buildings were present.

## **FIGURES**

**FIGURE A.3-1  
CONCEPTUAL SITE MODEL**



**Notes:**

- <sup>a</sup> Resident scenario bounds the worker and recreational user scenarios
- <sup>b</sup> Per agreement with Base Closure Team

**Abbreviations and Acronyms:**

- IR – Installation Restoration
- N/A – not applicable
- RESRAD – Residual Radioactivity (Model)

**ATTACHMENT 1**

**RESRAD MODELING**

**(AVAILABLE ON CD ONLY)**

Summary : Parcel C Baseline 1 ft 2032 m2

File : Parcel C Total Baseline 1 ft 2032.rad

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Dose Conversion Factor (and Related) Parameter Summary

File: FGR 13 MORBIDITY

Menu	Parameter	Current Value	Base Case*	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2( 1)
B-1	Pb-210+D	2.320E-02	1.360E-02	DCF2( 2)
B-1	Ra-226+D	8.594E-03	8.580E-03	DCF2( 3)
B-1	Sr-90+D	1.308E-03	1.300E-03	DCF2( 4)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3( 1)
D-1	Pb-210+D	7.276E-03	5.370E-03	DCF3( 2)
D-1	Ra-226+D	1.321E-03	1.320E-03	DCF3( 3)
D-1	Sr-90+D	1.528E-04	1.420E-04	DCF3( 4)
D-34	Food transfer factors:			
D-34	Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF( 1,1)
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF( 1,2)
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF( 1,3)
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF( 2,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF( 2,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF( 2,3)
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF( 3,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF( 3,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF( 3,3)
D-34	Sr-90+D , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF( 4,1)
D-34	Sr-90+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-03	8.000E-03	RTF( 4,2)
D-34	Sr-90+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF( 4,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC( 1,1)
D-5	Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC( 1,2)
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC( 2,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC( 2,2)
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC( 3,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC( 3,2)
D-5	Sr-90+D , fish	6.000E+01	6.000E+01	BIOFAC( 4,1)
D-5	Sr-90+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC( 4,2)

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

Summary : Parcel C Baseline 1 ft 2032 m2  
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Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	2.032E+03	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	2.000E+00	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	not used	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T( 2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T( 3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T( 4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T( 5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T( 6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T( 7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T( 8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T( 9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Cs-137	1.130E-01	0.000E+00	---	SI( 1)
R012	Initial principal radionuclide (pCi/g): Ra-226	1.000E+00	0.000E+00	---	SI( 3)
R012	Initial principal radionuclide (pCi/g): Sr-90	3.310E-01	0.000E+00	---	SI( 4)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	WI( 1)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	WI( 3)
R012	Concentration in groundwater (pCi/L): Sr-90	not used	0.000E+00	---	WI( 4)
R013	Cover depth (m)	3.048E-01	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	1.500E+00	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	0.000E+00	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	2.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.000E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	not used	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	not used	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	not used	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	not used	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	not used	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	not used	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	not used	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	not used	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	not used	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	not used	1.000E+01	---	DWIBWT

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	not used	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	not used	2.500E+02	---	UW
R015	Number of unsaturated zone strata	not used	1	---	NS
R015	Unsat. zone 1, thickness (m)	not used	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	not used	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	not used	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	not used	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	not used	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	not used	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	not used	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	4.600E+03	4.600E+03	---	DCNUCC( 1)
R016	Unsat. zone 1 (cm**3/g)	not used	4.600E+03	---	DCNUCU( 1,1)
R016	Saturated zone (cm**3/g)	not used	4.600E+03	---	DCNUCS( 1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.623E-05	ALEACH( 1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 1)
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC( 3)
R016	Unsat. zone 1 (cm**3/g)	not used	7.000E+01	---	DCNUCU( 3,1)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS( 3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.374E-03	ALEACH( 3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 3)
R016	Distribution coefficients for Sr-90				
R016	Contaminated zone (cm**3/g)	3.000E+01	3.000E+01	---	DCNUCC( 4)
R016	Unsat. zone 1 (cm**3/g)	not used	3.000E+01	---	DCNUCU( 4,1)
R016	Saturated zone (cm**3/g)	not used	3.000E+01	---	DCNUCS( 4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.516E-03	ALEACH( 4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 4)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC( 2)
R016	Unsat. zone 1 (cm**3/g)	not used	1.000E+02	---	DCNUCU( 2,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS( 2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.663E-03	ALEACH( 2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 2)
R017	Inhalation rate (m**3/yr)	7.270E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	2.400E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	9.590E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE( 1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE( 2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE( 3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE( 4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE( 5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE( 6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE( 7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE( 8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE( 9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA( 1)
R017	Ring 2	not used	2.732E-01	---	FRACA( 2)
R017	Ring 3	not used	0.000E+00	---	FRACA( 3)
R017	Ring 4	not used	0.000E+00	---	FRACA( 4)
R017	Ring 5	not used	0.000E+00	---	FRACA( 5)
R017	Ring 6	not used	0.000E+00	---	FRACA( 6)
R017	Ring 7	not used	0.000E+00	---	FRACA( 7)
R017	Ring 8	not used	0.000E+00	---	FRACA( 8)
R017	Ring 9	not used	0.000E+00	---	FRACA( 9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	not used	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	not used	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	not used	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	not used	-1	---	FPLANT
R018	Contamination fraction of meat	not used	-1	---	FMEAT
R018	Contamination fraction of milk	not used	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	not used	5.000E-01	---	LSI

Summary : Parcel C Baseline 1 ft 2032 m2

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## Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R019	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	not used	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	not used	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	not used	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	not used	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	not used	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	not used	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	not used	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	not used	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	not used	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
C14	DCF correction factor for gaseous forms of C14	not used	0.000E+00	---	CO2F
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV

Summary : Parcel C Baseline 1 ft 2032 m2

File : Parcel C Total Baseline 1 ft 2032.rad

## Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	257	---	---	KYMAX

## Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	active
2 -- inhalation (w/o radon)	active
3 -- plant ingestion	suppressed
4 -- meat ingestion	suppressed
5 -- milk ingestion	suppressed
6 -- aquatic foods	suppressed
7 -- drinking water	suppressed
8 -- soil ingestion	active
9 -- radon	suppressed
Find peak pathway doses	suppressed

Summary : Parcel C Baseline 1 ft 2032 m2

File : Parcel C Total Baseline 1 ft 2032.rad

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	2032.00 square meters	Cs-137	1.130E-01
Thickness:	2.00 meters	Ra-226	1.000E+00
Cover Depth:	0.30 meters	Sr-90	3.310E-01

Total Dose TDOSE(t), mrem/yr

Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	2.899E-01	2.890E-01	2.872E-01	2.811E-01	2.646E-01	2.160E-01	1.230E-01	1.724E-02
M(t):	1.160E-02	1.156E-02	1.149E-02	1.124E-02	1.059E-02	8.642E-03	4.920E-03	6.896E-04

Maximum TDOSE(t): 2.899E-01 mrem/yr at t = 0.000E+00 years

Summary : Parcel C Baseline 1 ft 2032 m2

File : Parcel C Total Baseline 1 ft 2032.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	4.405E-03	0.0152	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
Ra-226	2.855E-01	0.9847	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
Sr-90	3.087E-05	0.0001	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
===== Total	2.899E-01	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	4.405E-03	0.0152										
Ra-226	0.000E+00	0.0000	2.855E-01	0.9847										
Sr-90	0.000E+00	0.0000	3.087E-05	0.0001										
===== Total	0.000E+00	0.0000	2.899E-01	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 1 ft 2032 m2

File : Parcel C Total Baseline 1 ft 2032.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	4.304E-03	0.0149	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
Ra-226	2.847E-01	0.9850	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
Sr-90	2.998E-05	0.0001	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
===== Total	2.890E-01	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	4.304E-03	0.0149										
Ra-226	0.000E+00	0.0000	2.847E-01	0.9850										
Sr-90	0.000E+00	0.0000	2.998E-05	0.0001										
===== Total	0.000E+00	0.0000	2.890E-01	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 1 ft 2032 m2

File : Parcel C Total Baseline 1 ft 2032.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	4.110E-03	0.0143	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
Ra-226	2.831E-01	0.9856	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
Sr-90	2.827E-05	0.0001	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
===== Total	2.872E-01	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	4.110E-03	0.0143										
Ra-226	0.000E+00	0.0000	2.831E-01	0.9856										
Sr-90	0.000E+00	0.0000	2.827E-05	0.0001										
===== Total	0.000E+00	0.0000	2.872E-01	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 1 ft 2032 m2

File : Parcel C Total Baseline 1 ft 2032.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	3.495E-03	0.0124	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
Ra-226	2.776E-01	0.9875	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
Sr-90	2.303E-05	0.0001	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
===== Total	2.811E-01	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	3.495E-03	0.0124										
Ra-226	0.000E+00	0.0000	2.776E-01	0.9875										
Sr-90	0.000E+00	0.0000	2.303E-05	0.0001										
===== Total	0.000E+00	0.0000	2.811E-01	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 1 ft 2032 m2

File : Parcel C Total Baseline 1 ft 2032.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	2.200E-03	0.0083	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
Ra-226	2.624E-01	0.9916	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
Sr-90	1.281E-05	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
===== Total	2.646E-01	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	2.200E-03	0.0083										
Ra-226	0.000E+00	0.0000	2.624E-01	0.9916										
Sr-90	0.000E+00	0.0000	1.281E-05	0.0000										
===== Total	0.000E+00	0.0000	2.646E-01	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 1 ft 2032 m2

File : Parcel C Total Baseline 1 ft 2032.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	4.355E-04	0.0020	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
Ra-226	2.156E-01	0.9980	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
Sr-90	1.645E-06	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
===== Total	2.160E-01	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	4.355E-04	0.0020										
Ra-226	0.000E+00	0.0000	2.156E-01	0.9980										
Sr-90	0.000E+00	0.0000	1.645E-06	0.0000										
===== Total	0.000E+00	0.0000	2.160E-01	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 1 ft 2032 m2

File : Parcel C Total Baseline 1 ft 2032.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	4.255E-06	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
Ra-226	1.230E-01	1.0000	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
Sr-90	4.673E-09	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
===== Total	1.230E-01	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	4.255E-06	0.0000										
Ra-226	0.000E+00	0.0000	1.230E-01	1.0000										
Sr-90	0.000E+00	0.0000	4.673E-09	0.0000										
===== Total	0.000E+00	0.0000	1.230E-01	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 1 ft 2032 m2

File : Parcel C Total Baseline 1 ft 2032.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	3.925E-13	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
Ra-226	1.724E-02	1.0000	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
Sr-90	5.706E-18	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
===== Total	1.724E-02	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	3.925E-13	0.0000										
Ra-226	0.000E+00	0.0000	1.724E-02	1.0000										
Sr-90	0.000E+00	0.0000	5.706E-18	0.0000										
===== Total	0.000E+00	0.0000	1.724E-02	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 1 ft 2032 m2

File : Parcel C Total Baseline 1 ft 2032.rad

Dose/Source Ratios Summed Over All Pathways  
 Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137+D	Cs-137+D	1.000E+00	3.898E-02	3.809E-02	3.637E-02	3.093E-02	1.947E-02	3.854E-03	3.766E-05	3.474E-12
Ra-226+D	Ra-226+D	1.000E+00	2.855E-01	2.847E-01	2.831E-01	2.776E-01	2.624E-01	2.156E-01	1.230E-01	1.724E-02
Ra-226+D	Pb-210+D	1.000E+00	1.170E-07	3.457E-07	7.791E-07	2.072E-06	4.348E-06	5.673E-06	3.403E-06	4.772E-07
Ra-226+D	\$DSR(j)		2.855E-01	2.847E-01	2.831E-01	2.776E-01	2.624E-01	2.156E-01	1.230E-01	1.724E-02
Sr-90+D	Sr-90+D	1.000E+00	9.328E-05	9.058E-05	8.542E-05	6.957E-05	3.871E-05	4.971E-06	1.412E-08	1.724E-17

§ is used to indicate summation; the Greek sigma is not included in this font.  
 The DSR includes contributions from associated (half-life <= 180 days) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g  
 Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Nuclide (i)	t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137	6.413E+02	6.563E+02	6.874E+02	8.083E+02	1.284E+03	6.488E+03	6.639E+05	7.197E+12	
Ra-226	8.758E+01	8.782E+01	8.832E+01	9.007E+01	9.527E+01	1.160E+02	2.033E+02	1.450E+03	
Sr-90	2.680E+05	2.760E+05	2.927E+05	3.593E+05	6.459E+05	5.029E+06	1.771E+09	*1.365E+14	

\*At specific activity limit

Summed Dose/Source Ratios DSR(i,t) in (mrem/yr)/(pCi/g)  
 and Single Radionuclide Soil Guidelines G(i,t) in pCi/g  
 at tmin = time of minimum single radionuclide soil guideline  
 and at tmax = time of maximum total dose = 0.000E+00 years

Nuclide (i)	Initial (pCi/g)	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Cs-137	1.130E-01	0.000E+00	3.898E-02	6.413E+02	3.898E-02	6.413E+02
Ra-226	1.000E+00	0.000E+00	2.855E-01	8.758E+01	2.855E-01	8.758E+01
Sr-90	3.310E-01	0.000E+00	9.328E-05	2.680E+05	9.328E-05	2.680E+05

Summary : Parcel C Baseline 1 ft 2032 m2

File : Parcel C Total Baseline 1 ft 2032.rad

Individual Nuclide Dose Summed Over All Pathways  
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	DOSE(j,t), mrem/yr							
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137	Cs-137	1.000E+00	4.405E-03	4.304E-03	4.110E-03	3.495E-03	2.200E-03	4.355E-04	4.255E-06	3.925E-13
Ra-226	Ra-226	1.000E+00	2.855E-01	2.847E-01	2.831E-01	2.776E-01	2.624E-01	2.156E-01	1.230E-01	1.724E-02
Pb-210	Ra-226	1.000E+00	1.170E-07	3.457E-07	7.791E-07	2.072E-06	4.348E-06	5.673E-06	3.403E-06	4.772E-07
Sr-90	Sr-90	1.000E+00	3.087E-05	2.998E-05	2.827E-05	2.303E-05	1.281E-05	1.645E-06	4.673E-09	5.706E-18
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

THF(i) is the thread fraction of the parent nuclide.

\$ is used to indicate summation; the Greek sigma is not included in this font.

Individual Nuclide Soil Concentration  
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g							
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137	Cs-137	1.000E+00	1.130E-01	1.104E-01	1.054E-01	8.966E-02	5.644E-02	1.117E-02	1.092E-04	1.007E-11
Ra-226	Ra-226	1.000E+00	1.000E+00	9.972E-01	9.916E-01	9.723E-01	9.192E-01	7.553E-01	4.308E-01	6.039E-02
Pb-210	Ra-226	1.000E+00	0.000E+00	3.054E-02	8.844E-02	2.612E-01	5.656E-01	7.448E-01	4.472E-01	6.270E-02
Sr-90	Sr-90	1.000E+00	3.310E-01	3.214E-01	3.031E-01	2.469E-01	1.374E-01	1.764E-02	5.010E-05	6.118E-14
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

THF(i) is the thread fraction of the parent nuclide.

\$ is used to indicate summation; the Greek sigma is not included in this font.

RESCALC.EXE execution time = 1.59 seconds

Intrisk : Parcel C Baseline 1 ft 2032 m2

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Cancer Risk Slope Factors Summary Table

Risk Library: FGR 13 Morbidity

Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-1	Ground external radiation slope factors, 1/yr per (pCi/g):			
Sf-1	Cs-137+D	2.55E-06	5.32E-10	SLPF( 1,1)
Sf-1	Pb-210+D	4.21E-09	1.41E-09	SLPF( 2,1)
Sf-1	Ra-226+D	8.49E-06	2.29E-08	SLPF( 3,1)
Sf-1	Sr-90+D	1.96E-08	4.82E-10	SLPF( 4,1)
Sf-2	Inhalation, slope factors, 1/(pCi):			
Sf-2	Cs-137+D	1.12E-10	1.12E-10	SLPF( 1,2)
Sf-2	Pb-210+D	3.08E-08	1.58E-08	SLPF( 2,2)
Sf-2	Ra-226+D	2.83E-08	2.82E-08	SLPF( 3,2)
Sf-2	Sr-90+D	4.33E-10	4.25E-10	SLPF( 4,2)
Sf-3	Food ingestion, slope factors, 1/(pCi):			
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF( 1,3)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF( 2,3)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF( 3,3)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF( 4,3)
Sf-3	Water ingestion, slope factors, 1/(pCi):			
Sf-3	Cs-137+D	3.04E-11	3.04E-11	SLPF( 1,4)
Sf-3	Pb-210+D	2.66E-09	8.81E-10	SLPF( 2,4)
Sf-3	Ra-226+D	3.86E-10	3.85E-10	SLPF( 3,4)
Sf-3	Sr-90+D	7.40E-11	5.59E-11	SLPF( 4,4)
Sf-3	Soil ingestion, slope factors, 1/(pCi):			
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF( 1,5)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF( 2,5)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF( 3,5)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF( 4,5)
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	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)

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

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Risk Slope and Environmental Transport Factors for the Ground Pathway

Nuclide (i)	Slope(i)* t=	ETFG(i,t) At Time in Years (dimensionless)							
		0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
At-218	3.570E-09	3.357E-08	3.357E-08	3.357E-08	3.357E-08	3.357E-08	3.357E-08	3.357E-08	3.357E-08
Ba-137m	2.690E-06	1.156E-02	1.156E-02	1.156E-02	1.156E-02	1.156E-02	1.156E-02	1.156E-02	1.156E-02
Bi-210	2.760E-09	1.903E-03	1.903E-03	1.903E-03	1.903E-03	1.903E-03	1.903E-03	1.903E-03	1.903E-03
Bi-214	7.480E-06	2.839E-02	2.839E-02	2.839E-02	2.839E-02	2.839E-02	2.839E-02	2.839E-02	2.839E-02
Cs-137	5.320E-10	6.206E-04	6.206E-04	6.206E-04	6.206E-04	6.206E-04	6.206E-04	6.206E-04	6.206E-04
Pb-210	1.410E-09	1.253E-10	1.253E-10	1.253E-10	1.253E-10	1.253E-10	1.253E-10	1.253E-10	1.253E-10
Pb-214	9.820E-07	5.519E-03	5.519E-03	5.519E-03	5.519E-03	5.519E-03	5.519E-03	5.519E-03	5.519E-03
Po-210	3.950E-11	1.452E-02	1.452E-02	1.452E-02	1.452E-02	1.452E-02	1.452E-02	1.452E-02	1.452E-02
Po-214	3.860E-10	1.572E-02	1.572E-02	1.572E-02	1.572E-02	1.572E-02	1.572E-02	1.572E-02	1.572E-02
Po-218	4.260E-11	1.575E-02	1.575E-02	1.575E-02	1.575E-02	1.575E-02	1.575E-02	1.575E-02	1.575E-02
Ra-226	2.290E-08	1.865E-03	1.865E-03	1.865E-03	1.865E-03	1.865E-03	1.865E-03	1.865E-03	1.865E-03
Rn-222	1.740E-09	1.002E-02	1.002E-02	1.002E-02	1.002E-02	1.002E-02	1.002E-02	1.002E-02	1.002E-02
Sr-90	4.820E-10	3.425E-04	3.425E-04	3.425E-04	3.425E-04	3.425E-04	3.425E-04	3.425E-04	3.425E-04
Tl-210	0.000E+00	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01
Y-90	1.910E-08	3.948E-03	3.948E-03	3.948E-03	3.948E-03	3.948E-03	3.948E-03	3.948E-03	3.948E-03
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

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

Intrisk : Parcel C Baseline 1 ft 2032 m2

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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	
Cs-137	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
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	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
Sr-90	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
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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

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= 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.
Cs-137	6.123E-08	0.0120	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
Pb-210	3.985E-11	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
Ra-226	5.055E-06	0.9879	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
Sr-90	4.311E-10	0.0001	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
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	5.117E-06	1.0000	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



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Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	6.123E-08	0.0120										
Ra-226	0.000E+00	0.0000	5.055E-06	0.9879										
Sr-90	0.000E+00	0.0000	4.311E-10	0.0001										
===== Total	0.000E+00	0.0000	5.117E-06	1.0000										

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

Intrisk : Parcel C Baseline 1 ft 2032 m2

File : Parcel C Total Baseline 1 ft 2032.rad

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	
Cs-137	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
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	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
Sr-90	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
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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= 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

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.
Cs-137	5.983E-08	0.0117	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
Pb-210	4.269E-11	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
Ra-226	5.041E-06	0.9882	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
Sr-90	4.186E-10	0.0001	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
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	5.101E-06	1.0000	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



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Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	5.983E-08	0.0117										
Ra-226	0.000E+00	0.0000	5.041E-06	0.9882										
Sr-90	0.000E+00	0.0000	4.186E-10	0.0001										
===== Total	0.000E+00	0.0000	5.101E-06	1.0000										

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

Intrisk : Parcel C Baseline 1 ft 2032 m2

File : Parcel C Total Baseline 1 ft 2032.rad

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		
Cs-137	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	0.000E+00
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	0.000E+00
Ra-226	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	0.000E+00
Sr-90	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	0.000E+00
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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

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 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.
Cs-137	5.712E-08	0.0113	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
Pb-210	4.808E-11	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
Ra-226	5.013E-06	0.9886	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
Sr-90	3.948E-10	0.0001	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
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	5.070E-06	1.0000	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



Intrisk : Parcel C Baseline 1 ft 2032 m2

File : Parcel C Total Baseline 1 ft 2032.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	5.712E-08	0.0113										
Ra-226	0.000E+00	0.0000	5.013E-06	0.9887										
Sr-90	0.000E+00	0.0000	3.948E-10	0.0001										
===== Total	0.000E+00	0.0000	5.070E-06	1.0000										

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

Intrisk : Parcel C Baseline 1 ft 2032 m2

File : Parcel C Total Baseline 1 ft 2032.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		
Cs-137	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	0.000E+00
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	0.000E+00
Ra-226	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	0.000E+00
Sr-90	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	0.000E+00

\* 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= 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

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.
Cs-137	4.858E-08	0.0098	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
Pb-210	6.404E-11	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
Ra-226	4.915E-06	0.9901	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
Sr-90	3.215E-10	0.0001	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
Total	4.964E-06	1.0000	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



Intrisk : Parcel C Baseline 1 ft 2032 m2

File : Parcel C Total Baseline 1 ft 2032.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	4.858E-08	0.0098										
Ra-226	0.000E+00	0.0000	4.915E-06	0.9901										
Sr-90	0.000E+00	0.0000	3.215E-10	0.0001										
===== Total	0.000E+00	0.0000	4.964E-06	1.0000										

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

Intrisk : Parcel C Baseline 1 ft 2032 m2

File : Parcel C Total Baseline 1 ft 2032.rad

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As pCi/yr at t= 3.000E+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		
Cs-137	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	0.000E+00
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	0.000E+00
Ra-226	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	0.000E+00
Sr-90	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	0.000E+00
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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+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

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p) and Fraction of Total Risk at t= 3.000E+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.
Cs-137	3.058E-08	0.0065	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
Pb-210	9.141E-11	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
Ra-226	4.647E-06	0.9934	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
Sr-90	1.789E-10	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
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	4.678E-06	1.0000	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



Intrisk : Parcel C Baseline 1 ft 2032 m2

File : Parcel C Total Baseline 1 ft 2032.rad

Total Excess Cancer Risk CNRSI(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.										
Cs-137	0.000E+00	0.0000	3.058E-08	0.0065										
Ra-226	0.000E+00	0.0000	4.647E-06	0.9934										
Sr-90	0.000E+00	0.0000	1.789E-10	0.0000										
===== Total	0.000E+00	0.0000	4.678E-06	1.0000										

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

Intrisk : Parcel C Baseline 1 ft 2032 m2

File : Parcel C Total Baseline 1 ft 2032.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		
Cs-137	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	0.000E+00
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	0.000E+00
Ra-226	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	0.000E+00
Sr-90	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	0.000E+00
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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= 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

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 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.
Cs-137	6.053E-09	0.0016	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
Pb-210	1.022E-10	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
Ra-226	3.818E-06	0.9984	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
Sr-90	2.297E-11	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
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	3.824E-06	1.0000	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



Intrisk : Parcel C Baseline 1 ft 2032 m2

File : Parcel C Total Baseline 1 ft 2032.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	6.053E-09	0.0016										
Ra-226	0.000E+00	0.0000	3.818E-06	0.9984										
Sr-90	0.000E+00	0.0000	2.297E-11	0.0000										
===== Total	0.000E+00	0.0000	3.824E-06	1.0000										

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

Intrisk : Parcel C Baseline 1 ft 2032 m2

File : Parcel C Total Baseline 1 ft 2032.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		
Cs-137	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	0.000E+00
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	0.000E+00
Ra-226	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	0.000E+00
Sr-90	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	0.000E+00
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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+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

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.
Cs-137	5.915E-11	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
Pb-210	6.048E-11	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
Ra-226	2.178E-06	0.9999	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
Sr-90	6.525E-14	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
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	2.178E-06	1.0000	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



Intrisk : Parcel C Baseline 1 ft 2032 m2

File : Parcel C Total Baseline 1 ft 2032.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	5.915E-11	0.0000										
Ra-226	0.000E+00	0.0000	2.178E-06	1.0000										
Sr-90	0.000E+00	0.0000	6.525E-14	0.0000										
===== Total	0.000E+00	0.0000	2.178E-06	1.0000										

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

Intrisk : Parcel C Baseline 1 ft 2032 m2

File : Parcel C Total Baseline 1 ft 2032.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		
Cs-137	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	0.000E+00
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	0.000E+00
Ra-226	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	0.000E+00
Sr-90	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	0.000E+00
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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= 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

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.
Cs-137	5.456E-18	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
Pb-210	8.479E-12	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
Ra-226	3.053E-07	1.0000	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
Sr-90	7.968E-23	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
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	3.053E-07	1.0000	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



Intrisk : Parcel C Baseline 1 ft 2032 m2

File : Parcel C Total Baseline 1 ft 2032.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	5.456E-18	0.0000										
Ra-226	0.000E+00	0.0000	3.053E-07	1.0000										
Sr-90	0.000E+00	0.0000	7.968E-23	0.0000										
===== Total	0.000E+00	0.0000	3.053E-07	1.0000										

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

Summary : Parcel C Baseline 1 ft 232 m2

File : Parcel C Total Baseline 1 ft 232.rad

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Summary : Parcel C Baseline 1 ft 232 m2

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Dose Conversion Factor (and Related) Parameter Summary

File: FGR 13 MORBIDITY

Menu	Parameter	Current Value	Base Case*	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2( 1)
B-1	Pb-210+D	2.320E-02	1.360E-02	DCF2( 2)
B-1	Ra-226+D	8.594E-03	8.580E-03	DCF2( 3)
B-1	Sr-90+D	1.308E-03	1.300E-03	DCF2( 4)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3( 1)
D-1	Pb-210+D	7.276E-03	5.370E-03	DCF3( 2)
D-1	Ra-226+D	1.321E-03	1.320E-03	DCF3( 3)
D-1	Sr-90+D	1.528E-04	1.420E-04	DCF3( 4)
D-34	Food transfer factors:			
D-34	Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF( 1,1)
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF( 1,2)
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF( 1,3)
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF( 2,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF( 2,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF( 2,3)
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF( 3,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF( 3,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF( 3,3)
D-34	Sr-90+D , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF( 4,1)
D-34	Sr-90+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-03	8.000E-03	RTF( 4,2)
D-34	Sr-90+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF( 4,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC( 1,1)
D-5	Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC( 1,2)
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC( 2,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC( 2,2)
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC( 3,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC( 3,2)
D-5	Sr-90+D , fish	6.000E+01	6.000E+01	BIOFAC( 4,1)
D-5	Sr-90+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC( 4,2)

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

Summary : Parcel C Baseline 1 ft 232 m2

File : Parcel C Total Baseline 1 ft 232.rad

## Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	2.320E+02	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	2.000E+00	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	not used	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T( 2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T( 3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T( 4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T( 5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T( 6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T( 7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T( 8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T( 9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Cs-137	1.130E-01	0.000E+00	---	SI( 1)
R012	Initial principal radionuclide (pCi/g): Ra-226	1.000E+00	0.000E+00	---	SI( 3)
R012	Initial principal radionuclide (pCi/g): Sr-90	3.310E-01	0.000E+00	---	SI( 4)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	WI( 1)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	WI( 3)
R012	Concentration in groundwater (pCi/L): Sr-90	not used	0.000E+00	---	WI( 4)
R013	Cover depth (m)	3.048E-01	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	1.500E+00	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	0.000E+00	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	2.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.000E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	not used	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	not used	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	not used	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	not used	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	not used	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	not used	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	not used	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	not used	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	not used	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	not used	1.000E+01	---	DWIBWT

Summary : Parcel C Baseline 1 ft 232 m2

File : Parcel C Total Baseline 1 ft 232.rad

## Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	not used	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	not used	2.500E+02	---	UW
R015	Number of unsaturated zone strata	not used	1	---	NS
R015	Unsat. zone 1, thickness (m)	not used	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	not used	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	not used	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	not used	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	not used	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	not used	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	not used	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	4.600E+03	4.600E+03	---	DCNUCC( 1)
R016	Unsat. zone 1 (cm**3/g)	not used	4.600E+03	---	DCNUCU( 1,1)
R016	Saturated zone (cm**3/g)	not used	4.600E+03	---	DCNUCS( 1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.623E-05	ALEACH( 1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 1)
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC( 3)
R016	Unsat. zone 1 (cm**3/g)	not used	7.000E+01	---	DCNUCU( 3,1)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS( 3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.374E-03	ALEACH( 3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 3)
R016	Distribution coefficients for Sr-90				
R016	Contaminated zone (cm**3/g)	3.000E+01	3.000E+01	---	DCNUCC( 4)
R016	Unsat. zone 1 (cm**3/g)	not used	3.000E+01	---	DCNUCU( 4,1)
R016	Saturated zone (cm**3/g)	not used	3.000E+01	---	DCNUCS( 4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.516E-03	ALEACH( 4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 4)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC( 2)
R016	Unsat. zone 1 (cm**3/g)	not used	1.000E+02	---	DCNUCU( 2,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS( 2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.663E-03	ALEACH( 2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 2)
R017	Inhalation rate (m**3/yr)	7.270E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	2.400E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	9.590E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS

Summary : Parcel C Baseline 1 ft 232 m2

File : Parcel C Total Baseline 1 ft 232.rad

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE( 1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE( 2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE( 3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE( 4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE( 5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE( 6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE( 7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE( 8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE( 9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA( 1)
R017	Ring 2	not used	2.732E-01	---	FRACA( 2)
R017	Ring 3	not used	0.000E+00	---	FRACA( 3)
R017	Ring 4	not used	0.000E+00	---	FRACA( 4)
R017	Ring 5	not used	0.000E+00	---	FRACA( 5)
R017	Ring 6	not used	0.000E+00	---	FRACA( 6)
R017	Ring 7	not used	0.000E+00	---	FRACA( 7)
R017	Ring 8	not used	0.000E+00	---	FRACA( 8)
R017	Ring 9	not used	0.000E+00	---	FRACA( 9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	not used	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	not used	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	not used	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	not used	-1	---	FPLANT
R018	Contamination fraction of meat	not used	-1	---	FMEAT
R018	Contamination fraction of milk	not used	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	not used	5.000E-01	---	LSI

Summary : Parcel C Baseline 1 ft 232 m2

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## Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R019	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	not used	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	not used	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	not used	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	not used	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	not used	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	not used	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	not used	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	not used	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	not used	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
C14	DCF correction factor for gaseous forms of C14	not used	0.000E+00	---	CO2F
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV

Summary : Parcel C Baseline 1 ft 232 m2

File : Parcel C Total Baseline 1 ft 232.rad

## Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	257	---	---	KYMAX

## Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	active
2 -- inhalation (w/o radon)	active
3 -- plant ingestion	suppressed
4 -- meat ingestion	suppressed
5 -- milk ingestion	suppressed
6 -- aquatic foods	suppressed
7 -- drinking water	suppressed
8 -- soil ingestion	active
9 -- radon	suppressed
Find peak pathway doses	suppressed

Summary : Parcel C Baseline 1 ft 232 m2

File : Parcel C Total Baseline 1 ft 232.rad

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	232.00 square meters	Cs-137	1.130E-01
Thickness:	2.00 meters	Ra-226	1.000E+00
Cover Depth:	0.30 meters	Sr-90	3.310E-01

Total Dose TDOSE(t), mrem/yr

Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	2.899E-01	2.890E-01	2.872E-01	2.811E-01	2.646E-01	2.160E-01	1.230E-01	1.724E-02
M(t):	1.160E-02	1.156E-02	1.149E-02	1.124E-02	1.059E-02	8.642E-03	4.920E-03	6.896E-04

Maximum TDOSE(t): 2.899E-01 mrem/yr at t = 0.000E+00 years

Summary : Parcel C Baseline 1 ft 232 m2

File : Parcel C Total Baseline 1 ft 232.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	4.405E-03	0.0152	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
Ra-226	2.855E-01	0.9847	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
Sr-90	3.087E-05	0.0001	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
===== Total	2.899E-01	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	4.405E-03	0.0152										
Ra-226	0.000E+00	0.0000	2.855E-01	0.9847										
Sr-90	0.000E+00	0.0000	3.087E-05	0.0001										
===== Total	0.000E+00	0.0000	2.899E-01	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 1 ft 232 m2

File : Parcel C Total Baseline 1 ft 232.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	4.304E-03	0.0149	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
Ra-226	2.847E-01	0.9850	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
Sr-90	2.998E-05	0.0001	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
===== Total	2.890E-01	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	4.304E-03	0.0149										
Ra-226	0.000E+00	0.0000	2.847E-01	0.9850										
Sr-90	0.000E+00	0.0000	2.998E-05	0.0001										
===== Total	0.000E+00	0.0000	2.890E-01	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 1 ft 232 m2

File : Parcel C Total Baseline 1 ft 232.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	4.110E-03	0.0143	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
Ra-226	2.831E-01	0.9856	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
Sr-90	2.827E-05	0.0001	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
===== Total	2.872E-01	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	4.110E-03	0.0143										
Ra-226	0.000E+00	0.0000	2.831E-01	0.9856										
Sr-90	0.000E+00	0.0000	2.827E-05	0.0001										
===== Total	0.000E+00	0.0000	2.872E-01	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 1 ft 232 m2

File : Parcel C Total Baseline 1 ft 232.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	3.495E-03	0.0124	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
Ra-226	2.776E-01	0.9875	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
Sr-90	2.303E-05	0.0001	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
===== Total	2.811E-01	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	3.495E-03	0.0124										
Ra-226	0.000E+00	0.0000	2.776E-01	0.9875										
Sr-90	0.000E+00	0.0000	2.303E-05	0.0001										
===== Total	0.000E+00	0.0000	2.811E-01	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 1 ft 232 m2

File : Parcel C Total Baseline 1 ft 232.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	2.200E-03	0.0083	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
Ra-226	2.624E-01	0.9916	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
Sr-90	1.281E-05	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
===== Total	2.646E-01	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	2.200E-03	0.0083										
Ra-226	0.000E+00	0.0000	2.624E-01	0.9916										
Sr-90	0.000E+00	0.0000	1.281E-05	0.0000										
===== Total	0.000E+00	0.0000	2.646E-01	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 1 ft 232 m2

File : Parcel C Total Baseline 1 ft 232.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	4.355E-04	0.0020	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
Ra-226	2.156E-01	0.9980	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
Sr-90	1.645E-06	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
===== Total	2.160E-01	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	4.355E-04	0.0020										
Ra-226	0.000E+00	0.0000	2.156E-01	0.9980										
Sr-90	0.000E+00	0.0000	1.645E-06	0.0000										
===== Total	0.000E+00	0.0000	2.160E-01	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 1 ft 232 m2

File : Parcel C Total Baseline 1 ft 232.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	4.255E-06	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
Ra-226	1.230E-01	1.0000	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
Sr-90	4.673E-09	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
===== Total	1.230E-01	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	4.255E-06	0.0000										
Ra-226	0.000E+00	0.0000	1.230E-01	1.0000										
Sr-90	0.000E+00	0.0000	4.673E-09	0.0000										
===== Total	0.000E+00	0.0000	1.230E-01	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 1 ft 232 m2

File : Parcel C Total Baseline 1 ft 232.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	3.925E-13	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
Ra-226	1.724E-02	1.0000	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
Sr-90	5.706E-18	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
===== Total	1.724E-02	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	3.925E-13	0.0000										
Ra-226	0.000E+00	0.0000	1.724E-02	1.0000										
Sr-90	0.000E+00	0.0000	5.706E-18	0.0000										
===== Total	0.000E+00	0.0000	1.724E-02	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 1 ft 232 m2

File : Parcel C Total Baseline 1 ft 232.rad

Dose/Source Ratios Summed Over All Pathways  
 Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137+D	Cs-137+D	1.000E+00	3.898E-02	3.809E-02	3.637E-02	3.093E-02	1.947E-02	3.854E-03	3.766E-05	3.474E-12
Ra-226+D	Ra-226+D	1.000E+00	2.855E-01	2.847E-01	2.831E-01	2.776E-01	2.624E-01	2.156E-01	1.230E-01	1.724E-02
Ra-226+D	Pb-210+D	1.000E+00	1.170E-07	3.457E-07	7.791E-07	2.072E-06	4.348E-06	5.673E-06	3.403E-06	4.772E-07
Ra-226+D	§DSR(j)		2.855E-01	2.847E-01	2.831E-01	2.776E-01	2.624E-01	2.156E-01	1.230E-01	1.724E-02
Sr-90+D	Sr-90+D	1.000E+00	9.328E-05	9.058E-05	8.542E-05	6.957E-05	3.871E-05	4.971E-06	1.412E-08	1.724E-17

§ is used to indicate summation; the Greek sigma is not included in this font.  
 The DSR includes contributions from associated (half-life <= 180 days) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g  
 Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Nuclide (i)	t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137	6.413E+02	6.563E+02	6.874E+02	8.083E+02	1.284E+03	6.488E+03	6.639E+05	7.197E+12	
Ra-226	8.758E+01	8.782E+01	8.832E+01	9.007E+01	9.527E+01	1.160E+02	2.033E+02	1.450E+03	
Sr-90	2.680E+05	2.760E+05	2.927E+05	3.593E+05	6.459E+05	5.029E+06	1.771E+09	*1.365E+14	

\*At specific activity limit

Summed Dose/Source Ratios DSR(i,t) in (mrem/yr)/(pCi/g)  
 and Single Radionuclide Soil Guidelines G(i,t) in pCi/g  
 at tmin = time of minimum single radionuclide soil guideline  
 and at tmax = time of maximum total dose = 0.000E+00 years

Nuclide (i)	Initial (pCi/g)	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Cs-137	1.130E-01	0.000E+00	3.898E-02	6.413E+02	3.898E-02	6.413E+02
Ra-226	1.000E+00	0.000E+00	2.855E-01	8.758E+01	2.855E-01	8.758E+01
Sr-90	3.310E-01	0.000E+00	9.328E-05	2.680E+05	9.328E-05	2.680E+05

Summary : Parcel C Baseline 1 ft 232 m2

File : Parcel C Total Baseline 1 ft 232.rad

Individual Nuclide Dose Summed Over All Pathways  
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	DOSE(j,t), mrem/yr							
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137	Cs-137	1.000E+00	4.405E-03	4.304E-03	4.110E-03	3.495E-03	2.200E-03	4.355E-04	4.255E-06	3.925E-13
Ra-226	Ra-226	1.000E+00	2.855E-01	2.847E-01	2.831E-01	2.776E-01	2.624E-01	2.156E-01	1.230E-01	1.724E-02
Pb-210	Ra-226	1.000E+00	1.170E-07	3.457E-07	7.791E-07	2.072E-06	4.348E-06	5.673E-06	3.403E-06	4.772E-07
Sr-90	Sr-90	1.000E+00	3.087E-05	2.998E-05	2.827E-05	2.303E-05	1.281E-05	1.645E-06	4.673E-09	5.706E-18
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

THF(i) is the thread fraction of the parent nuclide.

\$ is used to indicate summation; the Greek sigma is not included in this font.

Individual Nuclide Soil Concentration  
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g							
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137	Cs-137	1.000E+00	1.130E-01	1.104E-01	1.054E-01	8.966E-02	5.644E-02	1.117E-02	1.092E-04	1.007E-11
Ra-226	Ra-226	1.000E+00	1.000E+00	9.972E-01	9.916E-01	9.723E-01	9.192E-01	7.553E-01	4.308E-01	6.039E-02
Pb-210	Ra-226	1.000E+00	0.000E+00	3.054E-02	8.844E-02	2.612E-01	5.656E-01	7.448E-01	4.472E-01	6.270E-02
Sr-90	Sr-90	1.000E+00	3.310E-01	3.214E-01	3.031E-01	2.469E-01	1.374E-01	1.764E-02	5.010E-05	6.118E-14
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

THF(i) is the thread fraction of the parent nuclide.

\$ is used to indicate summation; the Greek sigma is not included in this font.

RESCALC.EXE execution time = 2.34 seconds

Intrisk : Parcel C Baseline 1 ft 232 m2

File : Parcel C Total Baseline 1 ft 232.rad

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Intrisk : Parcel C Baseline 1 ft 232 m2

File : Parcel C Total Baseline 1 ft 232.rad

Cancer Risk Slope Factors Summary Table

Risk Library: FGR 13 Morbidity

Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-1	Ground external radiation slope factors, 1/yr per (pCi/g):			
Sf-1	Cs-137+D	2.55E-06	5.32E-10	SLPF( 1,1)
Sf-1	Pb-210+D	4.21E-09	1.41E-09	SLPF( 2,1)
Sf-1	Ra-226+D	8.49E-06	2.29E-08	SLPF( 3,1)
Sf-1	Sr-90+D	1.96E-08	4.82E-10	SLPF( 4,1)
Sf-2	Inhalation, slope factors, 1/(pCi):			
Sf-2	Cs-137+D	1.12E-10	1.12E-10	SLPF( 1,2)
Sf-2	Pb-210+D	3.08E-08	1.58E-08	SLPF( 2,2)
Sf-2	Ra-226+D	2.83E-08	2.82E-08	SLPF( 3,2)
Sf-2	Sr-90+D	4.33E-10	4.25E-10	SLPF( 4,2)
Sf-3	Food ingestion, slope factors, 1/(pCi):			
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF( 1,3)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF( 2,3)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF( 3,3)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF( 4,3)
Sf-3	Water ingestion, slope factors, 1/(pCi):			
Sf-3	Cs-137+D	3.04E-11	3.04E-11	SLPF( 1,4)
Sf-3	Pb-210+D	2.66E-09	8.81E-10	SLPF( 2,4)
Sf-3	Ra-226+D	3.86E-10	3.85E-10	SLPF( 3,4)
Sf-3	Sr-90+D	7.40E-11	5.59E-11	SLPF( 4,4)
Sf-3	Soil ingestion, slope factors, 1/(pCi):			
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF( 1,5)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF( 2,5)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF( 3,5)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF( 4,5)
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	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)

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

Intrisk : Parcel C Baseline 1 ft 232 m2

File : Parcel C Total Baseline 1 ft 232.rad

Risk Slope and Environmental Transport Factors for the Ground Pathway

Nuclide (i)	Slope(i)* t=	ETFG(i,t) At Time in Years (dimensionless)							
		0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
At-218	3.570E-09	3.357E-08	3.357E-08	3.357E-08	3.357E-08	3.357E-08	3.357E-08	3.357E-08	3.357E-08
Ba-137m	2.690E-06	1.156E-02	1.156E-02	1.156E-02	1.156E-02	1.156E-02	1.156E-02	1.156E-02	1.156E-02
Bi-210	2.760E-09	1.903E-03	1.903E-03	1.903E-03	1.903E-03	1.903E-03	1.903E-03	1.903E-03	1.903E-03
Bi-214	7.480E-06	2.839E-02	2.839E-02	2.839E-02	2.839E-02	2.839E-02	2.839E-02	2.839E-02	2.839E-02
Cs-137	5.320E-10	6.206E-04	6.206E-04	6.206E-04	6.206E-04	6.206E-04	6.206E-04	6.206E-04	6.206E-04
Pb-210	1.410E-09	1.253E-10	1.253E-10	1.253E-10	1.253E-10	1.253E-10	1.253E-10	1.253E-10	1.253E-10
Pb-214	9.820E-07	5.519E-03	5.519E-03	5.519E-03	5.519E-03	5.519E-03	5.519E-03	5.519E-03	5.519E-03
Po-210	3.950E-11	1.452E-02	1.452E-02	1.452E-02	1.452E-02	1.452E-02	1.452E-02	1.452E-02	1.452E-02
Po-214	3.860E-10	1.572E-02	1.572E-02	1.572E-02	1.572E-02	1.572E-02	1.572E-02	1.572E-02	1.572E-02
Po-218	4.260E-11	1.575E-02	1.575E-02	1.575E-02	1.575E-02	1.575E-02	1.575E-02	1.575E-02	1.575E-02
Ra-226	2.290E-08	1.865E-03	1.865E-03	1.865E-03	1.865E-03	1.865E-03	1.865E-03	1.865E-03	1.865E-03
Rn-222	1.740E-09	1.002E-02	1.002E-02	1.002E-02	1.002E-02	1.002E-02	1.002E-02	1.002E-02	1.002E-02
Sr-90	4.820E-10	3.425E-04	3.425E-04	3.425E-04	3.425E-04	3.425E-04	3.425E-04	3.425E-04	3.425E-04
Tl-210	0.000E+00	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01
Y-90	1.910E-08	3.948E-03	3.948E-03	3.948E-03	3.948E-03	3.948E-03	3.948E-03	3.948E-03	3.948E-03
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

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

Intrisk : Parcel C Baseline 1 ft 232 m2

File : Parcel C Total Baseline 1 ft 232.rad

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		
Cs-137	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	0.000E+00
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	0.000E+00
Ra-226	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	0.000E+00
Sr-90	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	0.000E+00
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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

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= 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.
Cs-137	6.123E-08	0.0120	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
Pb-210	3.985E-11	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
Ra-226	5.055E-06	0.9879	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
Sr-90	4.311E-10	0.0001	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
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	5.117E-06	1.0000	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



Intrisk : Parcel C Baseline 1 ft 232 m2

File : Parcel C Total Baseline 1 ft 232.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	6.123E-08	0.0120										
Ra-226	0.000E+00	0.0000	5.055E-06	0.9879										
Sr-90	0.000E+00	0.0000	4.311E-10	0.0001										
===== Total	0.000E+00	0.0000	5.117E-06	1.0000										

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

Intrisk : Parcel C Baseline 1 ft 232 m2

File : Parcel C Total Baseline 1 ft 232.rad

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		
Cs-137	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	0.000E+00
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	0.000E+00
Ra-226	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	0.000E+00
Sr-90	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	0.000E+00
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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= 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

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.
Cs-137	5.983E-08	0.0117	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
Pb-210	4.269E-11	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
Ra-226	5.041E-06	0.9882	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
Sr-90	4.186E-10	0.0001	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
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	5.101E-06	1.0000	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



Intrisk : Parcel C Baseline 1 ft 232 m2

File : Parcel C Total Baseline 1 ft 232.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	5.983E-08	0.0117										
Ra-226	0.000E+00	0.0000	5.041E-06	0.9882										
Sr-90	0.000E+00	0.0000	4.186E-10	0.0001										
===== Total	0.000E+00	0.0000	5.101E-06	1.0000										

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

Intrisk : Parcel C Baseline 1 ft 232 m2

File : Parcel C Total Baseline 1 ft 232.rad

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	
Cs-137	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
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	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
Sr-90	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
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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

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.
Cs-137	5.712E-08	0.0113	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
Pb-210	4.808E-11	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
Ra-226	5.013E-06	0.9886	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
Sr-90	3.948E-10	0.0001	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
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	5.070E-06	1.0000	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



Intrisk : Parcel C Baseline 1 ft 232 m2

File : Parcel C Total Baseline 1 ft 232.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	5.712E-08	0.0113										
Ra-226	0.000E+00	0.0000	5.013E-06	0.9887										
Sr-90	0.000E+00	0.0000	3.948E-10	0.0001										
===== Total	0.000E+00	0.0000	5.070E-06	1.0000										

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

Intrisk : Parcel C Baseline 1 ft 232 m2

File : Parcel C Total Baseline 1 ft 232.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		
Cs-137	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	0.000E+00
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	0.000E+00
Ra-226	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	0.000E+00
Sr-90	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	0.000E+00
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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= 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

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.
Cs-137	4.858E-08	0.0098	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
Pb-210	6.404E-11	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
Ra-226	4.915E-06	0.9901	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
Sr-90	3.215E-10	0.0001	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
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	4.964E-06	1.0000	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



Intrisk : Parcel C Baseline 1 ft 232 m2

File : Parcel C Total Baseline 1 ft 232.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	4.858E-08	0.0098										
Ra-226	0.000E+00	0.0000	4.915E-06	0.9901										
Sr-90	0.000E+00	0.0000	3.215E-10	0.0001										
===== Total	0.000E+00	0.0000	4.964E-06	1.0000										

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

Intrisk : Parcel C Baseline 1 ft 232 m2

File : Parcel C Total Baseline 1 ft 232.rad

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As pCi/yr at t= 3.000E+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		
Cs-137	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	0.000E+00
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	0.000E+00
Ra-226	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	0.000E+00
Sr-90	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	0.000E+00
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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+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

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 3.000E+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.
Cs-137	3.058E-08	0.0065	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
Pb-210	9.141E-11	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
Ra-226	4.647E-06	0.9934	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
Sr-90	1.789E-10	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
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	4.678E-06	1.0000	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



Intrisk : Parcel C Baseline 1 ft 232 m2

File : Parcel C Total Baseline 1 ft 232.rad

Total Excess Cancer Risk CNRSI(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.										
Cs-137	0.000E+00	0.0000	3.058E-08	0.0065										
Ra-226	0.000E+00	0.0000	4.647E-06	0.9934										
Sr-90	0.000E+00	0.0000	1.789E-10	0.0000										
===== Total	0.000E+00	0.0000	4.678E-06	1.0000										

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

Intrisk : Parcel C Baseline 1 ft 232 m2

File : Parcel C Total Baseline 1 ft 232.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		
Cs-137	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	0.000E+00
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	0.000E+00
Ra-226	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	0.000E+00
Sr-90	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	0.000E+00
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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= 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

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 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.
Cs-137	6.053E-09	0.0016	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
Pb-210	1.022E-10	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
Ra-226	3.818E-06	0.9984	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
Sr-90	2.297E-11	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
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	3.824E-06	1.0000	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



Intrisk : Parcel C Baseline 1 ft 232 m2

File : Parcel C Total Baseline 1 ft 232.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	6.053E-09	0.0016										
Ra-226	0.000E+00	0.0000	3.818E-06	0.9984										
Sr-90	0.000E+00	0.0000	2.297E-11	0.0000										
===== Total	0.000E+00	0.0000	3.824E-06	1.0000										

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

Intrisk : Parcel C Baseline 1 ft 232 m2

File : Parcel C Total Baseline 1 ft 232.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	
Cs-137	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
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	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
Sr-90	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
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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+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

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.
Cs-137	5.915E-11	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
Pb-210	6.048E-11	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
Ra-226	2.178E-06	0.9999	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
Sr-90	6.525E-14	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
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	2.178E-06	1.0000	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



Intrisk : Parcel C Baseline 1 ft 232 m2

File : Parcel C Total Baseline 1 ft 232.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	5.915E-11	0.0000										
Ra-226	0.000E+00	0.0000	2.178E-06	1.0000										
Sr-90	0.000E+00	0.0000	6.525E-14	0.0000										
===== Total	0.000E+00	0.0000	2.178E-06	1.0000										

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

Intrisk : Parcel C Baseline 1 ft 232 m2

File : Parcel C Total Baseline 1 ft 232.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		
Cs-137	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	0.000E+00
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	0.000E+00
Ra-226	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	0.000E+00
Sr-90	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	0.000E+00
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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= 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

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.
Cs-137	5.456E-18	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
Pb-210	8.479E-12	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
Ra-226	3.053E-07	1.0000	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
Sr-90	7.968E-23	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
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	3.053E-07	1.0000	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



Intrisk : Parcel C Baseline 1 ft 232 m2

File : Parcel C Total Baseline 1 ft 232.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	5.456E-18	0.0000										
Ra-226	0.000E+00	0.0000	3.053E-07	1.0000										
Sr-90	0.000E+00	0.0000	7.968E-23	0.0000										
===== Total	0.000E+00	0.0000	3.053E-07	1.0000										

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

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Dose Conversion Factor (and Related) Parameter Summary  
 File: FGR 13 MORBIDITY

Menu	Parameter	Current Value	Base Case*	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2( 1)
B-1	Pb-210+D	2.320E-02	1.360E-02	DCF2( 2)
B-1	Ra-226+D	8.594E-03	8.580E-03	DCF2( 3)
B-1	Sr-90+D	1.308E-03	1.300E-03	DCF2( 4)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3( 1)
D-1	Pb-210+D	7.276E-03	5.370E-03	DCF3( 2)
D-1	Ra-226+D	1.321E-03	1.320E-03	DCF3( 3)
D-1	Sr-90+D	1.528E-04	1.420E-04	DCF3( 4)
D-34	Food transfer factors:			
D-34	Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF( 1,1)
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF( 1,2)
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF( 1,3)
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF( 2,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF( 2,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF( 2,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF( 3,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF( 3,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF( 3,3)
D-34				
D-34	Sr-90+D , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF( 4,1)
D-34	Sr-90+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-03	8.000E-03	RTF( 4,2)
D-34	Sr-90+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF( 4,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC( 1,1)
D-5	Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC( 1,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC( 2,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC( 2,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC( 3,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC( 3,2)
D-5				
D-5	Sr-90+D , fish	6.000E+01	6.000E+01	BIOFAC( 4,1)
D-5	Sr-90+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC( 4,2)

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

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.000E+04	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	2.000E+00	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	not used	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T( 2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T( 3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T( 4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T( 5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T( 6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T( 7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T( 8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T( 9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Cs-137	1.130E-01	0.000E+00	---	SI( 1)
R012	Initial principal radionuclide (pCi/g): Ra-226	1.000E+00	0.000E+00	---	SI( 3)
R012	Initial principal radionuclide (pCi/g): Sr-90	3.310E-01	0.000E+00	---	SI( 4)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	WI( 1)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	WI( 3)
R012	Concentration in groundwater (pCi/L): Sr-90	not used	0.000E+00	---	WI( 4)
R013	Cover depth (m)	3.048E-01	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	1.500E+00	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	0.000E+00	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	2.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.000E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	not used	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	not used	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	not used	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	not used	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	not used	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	not used	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	not used	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	not used	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	not used	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	not used	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	not used	ND	---	MODEL

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R014	Well pumping rate (m**3/yr)	not used	2.500E+02	---	UW
R015	Number of unsaturated zone strata	not used	1	---	NS
R015	Unsat. zone 1, thickness (m)	not used	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	not used	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	not used	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	not used	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	not used	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	not used	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	not used	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	4.600E+03	4.600E+03	---	DCNUCC( 1)
R016	Unsat. zone 1 (cm**3/g)	not used	4.600E+03	---	DCNUCU( 1,1)
R016	Saturated zone (cm**3/g)	not used	4.600E+03	---	DCNUCS( 1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.623E-05	ALEACH( 1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 1)
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC( 3)
R016	Unsat. zone 1 (cm**3/g)	not used	7.000E+01	---	DCNUCU( 3,1)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS( 3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.374E-03	ALEACH( 3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 3)
R016	Distribution coefficients for Sr-90				
R016	Contaminated zone (cm**3/g)	3.000E+01	3.000E+01	---	DCNUCC( 4)
R016	Unsat. zone 1 (cm**3/g)	not used	3.000E+01	---	DCNUCU( 4,1)
R016	Saturated zone (cm**3/g)	not used	3.000E+01	---	DCNUCS( 4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.516E-03	ALEACH( 4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 4)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC( 2)
R016	Unsat. zone 1 (cm**3/g)	not used	1.000E+02	---	DCNUCU( 2,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS( 2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.663E-03	ALEACH( 2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 2)
R017	Inhalation rate (m**3/yr)	7.270E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	2.400E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	9.590E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE( 1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE( 2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE( 3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE( 4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE( 5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE( 6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE( 7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE( 8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE( 9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA( 1)
R017	Ring 2	not used	2.732E-01	---	FRACA( 2)
R017	Ring 3	not used	0.000E+00	---	FRACA( 3)
R017	Ring 4	not used	0.000E+00	---	FRACA( 4)
R017	Ring 5	not used	0.000E+00	---	FRACA( 5)
R017	Ring 6	not used	0.000E+00	---	FRACA( 6)
R017	Ring 7	not used	0.000E+00	---	FRACA( 7)
R017	Ring 8	not used	0.000E+00	---	FRACA( 8)
R017	Ring 9	not used	0.000E+00	---	FRACA( 9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	not used	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	not used	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	not used	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	not used	-1	---	FPLANT
R018	Contamination fraction of meat	not used	-1	---	FMEAT
R018	Contamination fraction of milk	not used	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	not used	5.000E-01	---	LSI
R019	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	---	MLFD

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	not used	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	not used	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	not used	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	not used	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	not used	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	not used	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	not used	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	not used	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	not used	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
C14	DCF correction factor for gaseous forms of C14	not used	0.000E+00	---	CO2F
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA (1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA (2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	257	---	---	KYMAX

Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	active
2 -- inhalation (w/o radon)	active
3 -- plant ingestion	suppressed
4 -- meat ingestion	suppressed
5 -- milk ingestion	suppressed
6 -- aquatic foods	suppressed
7 -- drinking water	suppressed
8 -- soil ingestion	active
9 -- radon	suppressed
Find peak pathway doses	suppressed

Contaminated Zone Dimensions

Initial Soil Concentrations, pCi/g

Area:	10000.00 square meters	Cs-137	1.130E-01
Thickness:	2.00 meters	Ra-226	1.000E+00
Cover Depth:	0.30 meters	Sr-90	3.310E-01

Total Dose TDOSE(t), mrem/yr

Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	2.899E-01	2.890E-01	2.872E-01	2.811E-01	2.646E-01	2.160E-01	1.230E-01	1.724E-02
M(t):	1.160E-02	1.156E-02	1.149E-02	1.124E-02	1.059E-02	8.642E-03	4.920E-03	6.896E-04

Maximum TDOSE(t): 2.899E-01 mrem/yr at t = 0.000E+00 years

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	4.405E-03	0.0152	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
Ra-226	2.855E-01	0.9847	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
Sr-90	3.087E-05	0.0001	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
===== Total	2.899E-01	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	4.405E-03	0.0152										
Ra-226	0.000E+00	0.0000	2.855E-01	0.9847										
Sr-90	0.000E+00	0.0000	3.087E-05	0.0001										
===== Total	0.000E+00	0.0000	2.899E-01	1.0000										

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	4.304E-03	0.0149	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
Ra-226	2.847E-01	0.9850	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
Sr-90	2.998E-05	0.0001	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
===== Total	2.890E-01	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	4.304E-03	0.0149										
Ra-226	0.000E+00	0.0000	2.847E-01	0.9850										
Sr-90	0.000E+00	0.0000	2.998E-05	0.0001										
===== Total	0.000E+00	0.0000	2.890E-01	1.0000										

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	4.110E-03	0.0143	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
Ra-226	2.831E-01	0.9856	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
Sr-90	2.827E-05	0.0001	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
===== Total	2.872E-01	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	4.110E-03	0.0143										
Ra-226	0.000E+00	0.0000	2.831E-01	0.9856										
Sr-90	0.000E+00	0.0000	2.827E-05	0.0001										
===== Total	0.000E+00	0.0000	2.872E-01	1.0000										

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	3.495E-03	0.0124	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
Ra-226	2.776E-01	0.9875	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
Sr-90	2.303E-05	0.0001	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
===== Total	2.811E-01	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	3.495E-03	0.0124										
Ra-226	0.000E+00	0.0000	2.776E-01	0.9875										
Sr-90	0.000E+00	0.0000	2.303E-05	0.0001										
===== Total	0.000E+00	0.0000	2.811E-01	1.0000										

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	2.200E-03	0.0083	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
Ra-226	2.624E-01	0.9916	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
Sr-90	1.281E-05	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
===== Total	2.646E-01	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	2.200E-03	0.0083										
Ra-226	0.000E+00	0.0000	2.624E-01	0.9916										
Sr-90	0.000E+00	0.0000	1.281E-05	0.0000										
===== Total	0.000E+00	0.0000	2.646E-01	1.0000										

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	4.355E-04	0.0020	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
Ra-226	2.156E-01	0.9980	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
Sr-90	1.645E-06	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
===== Total	2.160E-01	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	4.355E-04	0.0020										
Ra-226	0.000E+00	0.0000	2.156E-01	0.9980										
Sr-90	0.000E+00	0.0000	1.645E-06	0.0000										
===== Total	0.000E+00	0.0000	2.160E-01	1.0000										

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	4.255E-06	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
Ra-226	1.230E-01	1.0000	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
Sr-90	4.673E-09	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
===== Total	1.230E-01	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	4.255E-06	0.0000										
Ra-226	0.000E+00	0.0000	1.230E-01	1.0000										
Sr-90	0.000E+00	0.0000	4.673E-09	0.0000										
===== Total	0.000E+00	0.0000	1.230E-01	1.0000										

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	3.925E-13	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
Ra-226	1.724E-02	1.0000	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
Sr-90	5.706E-18	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
===== Total	1.724E-02	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	3.925E-13	0.0000										
Ra-226	0.000E+00	0.0000	1.724E-02	1.0000										
Sr-90	0.000E+00	0.0000	5.706E-18	0.0000										
===== Total	0.000E+00	0.0000	1.724E-02	1.0000										

\*Sum of all water independent and dependent pathways.

Dose/Source Ratios Summed Over All Pathways  
 Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137+D	Cs-137+D	1.000E+00	3.898E-02	3.809E-02	3.637E-02	3.093E-02	1.947E-02	3.854E-03	3.766E-05	3.474E-12
Ra-226+D	Ra-226+D	1.000E+00	2.855E-01	2.847E-01	2.831E-01	2.776E-01	2.624E-01	2.156E-01	1.230E-01	1.724E-02
Ra-226+D	Pb-210+D	1.000E+00	1.170E-07	3.457E-07	7.791E-07	2.072E-06	4.348E-06	5.673E-06	3.403E-06	4.772E-07
Ra-226+D	§DSR(j)		2.855E-01	2.847E-01	2.831E-01	2.776E-01	2.624E-01	2.156E-01	1.230E-01	1.724E-02
Sr-90+D	Sr-90+D	1.000E+00	9.328E-05	9.058E-05	8.542E-05	6.957E-05	3.871E-05	4.971E-06	1.412E-08	1.724E-17

§ is used to indicate summation; the Greek sigma is not included in this font.  
 The DSR includes contributions from associated (half-life <= 180 days) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g  
 Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Nuclide (i)	t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137	6.413E+02	6.563E+02	6.874E+02	8.083E+02	1.284E+03	6.488E+03	6.639E+05	7.197E+12	
Ra-226	8.758E+01	8.782E+01	8.832E+01	9.007E+01	9.527E+01	1.160E+02	2.033E+02	1.450E+03	
Sr-90	2.680E+05	2.760E+05	2.927E+05	3.593E+05	6.459E+05	5.029E+06	1.771E+09	*1.365E+14	

\*At specific activity limit

Summed Dose/Source Ratios DSR(i,t) in (mrem/yr)/(pCi/g)  
 and Single Radionuclide Soil Guidelines G(i,t) in pCi/g  
 at tmin = time of minimum single radionuclide soil guideline  
 and at tmax = time of maximum total dose = 0.000E+00 years

Nuclide (i)	Initial (pCi/g)	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Cs-137	1.130E-01	0.000E+00	3.898E-02	6.413E+02	3.898E-02	6.413E+02
Ra-226	1.000E+00	0.000E+00	2.855E-01	8.758E+01	2.855E-01	8.758E+01
Sr-90	3.310E-01	0.000E+00	9.328E-05	2.680E+05	9.328E-05	2.680E+05

Individual Nuclide Dose Summed Over All Pathways  
 Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	DOSE(j,t), mrem/yr							
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137	Cs-137	1.000E+00	4.405E-03	4.304E-03	4.110E-03	3.495E-03	2.200E-03	4.355E-04	4.255E-06	3.925E-13
Ra-226	Ra-226	1.000E+00	2.855E-01	2.847E-01	2.831E-01	2.776E-01	2.624E-01	2.156E-01	1.230E-01	1.724E-02
Pb-210	Ra-226	1.000E+00	1.170E-07	3.457E-07	7.791E-07	2.072E-06	4.348E-06	5.673E-06	3.403E-06	4.772E-07
Sr-90	Sr-90	1.000E+00	3.087E-05	2.998E-05	2.827E-05	2.303E-05	1.281E-05	1.645E-06	4.673E-09	5.706E-18
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

THF(i) is the thread fraction of the parent nuclide.  
 § is used to indicate summation; the Greek sigma is not included in this font.

Individual Nuclide Soil Concentration  
 Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g							
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137	Cs-137	1.000E+00	1.130E-01	1.104E-01	1.054E-01	8.966E-02	5.644E-02	1.117E-02	1.092E-04	1.007E-11
Ra-226	Ra-226	1.000E+00	1.000E+00	9.972E-01	9.916E-01	9.723E-01	9.192E-01	7.553E-01	4.308E-01	6.039E-02
Pb-210	Ra-226	1.000E+00	0.000E+00	3.054E-02	8.844E-02	2.612E-01	5.656E-01	7.448E-01	4.472E-01	6.270E-02
Sr-90	Sr-90	1.000E+00	3.310E-01	3.214E-01	3.031E-01	2.469E-01	1.374E-01	1.764E-02	5.010E-05	6.118E-14
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

THF(i) is the thread fraction of the parent nuclide.  
 § is used to indicate summation; the Greek sigma is not included in this font.

RESCALC.EXE execution time = 2.80 seconds

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Cancer Risk Slope Factors Summary Table  
 Risk Library: FGR 13 Morbidity

Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-1	Ground external radiation slope factors, 1/yr per (pCi/g):			
Sf-1	Cs-137+D	2.55E-06	5.32E-10	SLPF( 1,1)
Sf-1	Pb-210+D	4.21E-09	1.41E-09	SLPF( 2,1)
Sf-1	Ra-226+D	8.49E-06	2.29E-08	SLPF( 3,1)
Sf-1	Sr-90+D	1.96E-08	4.82E-10	SLPF( 4,1)
Sf-2	Inhalation, slope factors, 1/(pCi):			
Sf-2	Cs-137+D	1.12E-10	1.12E-10	SLPF( 1,2)
Sf-2	Pb-210+D	3.08E-08	1.58E-08	SLPF( 2,2)
Sf-2	Ra-226+D	2.83E-08	2.82E-08	SLPF( 3,2)
Sf-2	Sr-90+D	4.33E-10	4.25E-10	SLPF( 4,2)
Sf-3	Food ingestion, slope factors, 1/(pCi):			
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF( 1,3)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF( 2,3)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF( 3,3)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF( 4,3)
Sf-3	Water ingestion, slope factors, 1/(pCi):			
Sf-3	Cs-137+D	3.04E-11	3.04E-11	SLPF( 1,4)
Sf-3	Pb-210+D	2.66E-09	8.81E-10	SLPF( 2,4)
Sf-3	Ra-226+D	3.86E-10	3.85E-10	SLPF( 3,4)
Sf-3	Sr-90+D	7.40E-11	5.59E-11	SLPF( 4,4)
Sf-3	Soil ingestion, slope factors, 1/(pCi):			
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF( 1,5)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF( 2,5)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF( 3,5)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF( 4,5)
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	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)

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

Risk Slope and Environmental Transport Factors for the Ground Pathway

Nuclide (i)	Slope(i)* t=	ETFG(i,t) At Time in Years (dimensionless)							
		0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
At-218	3.570E-09	3.357E-08	3.357E-08	3.357E-08	3.357E-08	3.357E-08	3.357E-08	3.357E-08	3.357E-08
Ba-137m	2.690E-06	1.156E-02	1.156E-02	1.156E-02	1.156E-02	1.156E-02	1.156E-02	1.156E-02	1.156E-02
Bi-210	2.760E-09	1.903E-03	1.903E-03	1.903E-03	1.903E-03	1.903E-03	1.903E-03	1.903E-03	1.903E-03
Bi-214	7.480E-06	2.839E-02	2.839E-02	2.839E-02	2.839E-02	2.839E-02	2.839E-02	2.839E-02	2.839E-02
Cs-137	5.320E-10	6.206E-04	6.206E-04	6.206E-04	6.206E-04	6.206E-04	6.206E-04	6.206E-04	6.206E-04
Pb-210	1.410E-09	1.253E-10	1.253E-10	1.253E-10	1.253E-10	1.253E-10	1.253E-10	1.253E-10	1.253E-10
Pb-214	9.820E-07	5.519E-03	5.519E-03	5.519E-03	5.519E-03	5.519E-03	5.519E-03	5.519E-03	5.519E-03
Po-210	3.950E-11	1.452E-02	1.452E-02	1.452E-02	1.452E-02	1.452E-02	1.452E-02	1.452E-02	1.452E-02
Po-214	3.860E-10	1.572E-02	1.572E-02	1.572E-02	1.572E-02	1.572E-02	1.572E-02	1.572E-02	1.572E-02
Po-218	4.260E-11	1.575E-02	1.575E-02	1.575E-02	1.575E-02	1.575E-02	1.575E-02	1.575E-02	1.575E-02
Ra-226	2.290E-08	1.865E-03	1.865E-03	1.865E-03	1.865E-03	1.865E-03	1.865E-03	1.865E-03	1.865E-03
Rn-222	1.740E-09	1.002E-02	1.002E-02	1.002E-02	1.002E-02	1.002E-02	1.002E-02	1.002E-02	1.002E-02
Sr-90	4.820E-10	3.425E-04	3.425E-04	3.425E-04	3.425E-04	3.425E-04	3.425E-04	3.425E-04	3.425E-04
Tl-210	0.000E+00	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01
Y-90	1.910E-08	3.948E-03	3.948E-03	3.948E-03	3.948E-03	3.948E-03	3.948E-03	3.948E-03	3.948E-03
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

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

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		
Cs-137	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	0.000E+00
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	0.000E+00
Ra-226	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	0.000E+00
Sr-90	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	0.000E+00

\* 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

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= 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.
Cs-137	6.123E-08	0.0120	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
Pb-210	3.985E-11	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
Ra-226	5.055E-06	0.9879	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
Sr-90	4.311E-10	0.0001	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
Total	5.117E-06	1.0000	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



Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	6.123E-08	0.0120										
Ra-226	0.000E+00	0.0000	5.055E-06	0.9879										
Sr-90	0.000E+00	0.0000	4.311E-10	0.0001										
===== Total	0.000E+00	0.0000	5.117E-06	1.0000										

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

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	
Cs-137	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
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	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
Sr-90	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

\* 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= 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

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 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.
Cs-137	5.983E-08	0.0117	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
Pb-210	4.269E-11	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
Ra-226	5.041E-06	0.9882	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
Sr-90	4.186E-10	0.0001	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
Total	5.101E-06	1.0000	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



Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	5.983E-08	0.0117										
Ra-226	0.000E+00	0.0000	5.041E-06	0.9882										
Sr-90	0.000E+00	0.0000	4.186E-10	0.0001										
===== Total	0.000E+00	0.0000	5.101E-06	1.0000										

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

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		
Cs-137	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	0.000E+00
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	0.000E+00
Ra-226	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	0.000E+00
Sr-90	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	0.000E+00

\* 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

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.
Cs-137	5.712E-08	0.0113	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
Pb-210	4.808E-11	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
Ra-226	5.013E-06	0.9886	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
Sr-90	3.948E-10	0.0001	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
Total	5.070E-06	1.0000	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



Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	5.712E-08	0.0113										
Ra-226	0.000E+00	0.0000	5.013E-06	0.9887										
Sr-90	0.000E+00	0.0000	3.948E-10	0.0001										
===== Total	0.000E+00	0.0000	5.070E-06	1.0000										

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

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		
Cs-137	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	0.000E+00
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	0.000E+00
Ra-226	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	0.000E+00
Sr-90	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	0.000E+00

\* 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= 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

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.
Cs-137	4.858E-08	0.0098	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
Pb-210	6.404E-11	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
Ra-226	4.915E-06	0.9901	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
Sr-90	3.215E-10	0.0001	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
Total	4.964E-06	1.0000	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



Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	4.858E-08	0.0098										
Ra-226	0.000E+00	0.0000	4.915E-06	0.9901										
Sr-90	0.000E+00	0.0000	3.215E-10	0.0001										
===== Total	0.000E+00	0.0000	4.964E-06	1.0000										

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

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As pCi/yr at t= 3.000E+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		
Cs-137	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	0.000E+00
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	0.000E+00
Ra-226	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	0.000E+00
Sr-90	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	0.000E+00

\* 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+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

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p) and Fraction of Total Risk at t= 3.000E+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.
Cs-137	3.058E-08	0.0065	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
Pb-210	9.141E-11	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
Ra-226	4.647E-06	0.9934	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
Sr-90	1.789E-10	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
Total	4.678E-06	1.0000	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



Total Excess Cancer Risk CNRSI(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
 and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.										
Cs-137	0.000E+00	0.0000	3.058E-08	0.0065										
Ra-226	0.000E+00	0.0000	4.647E-06	0.9934										
Sr-90	0.000E+00	0.0000	1.789E-10	0.0000										
===== Total	0.000E+00	0.0000	4.678E-06	1.0000										

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

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	
Cs-137	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
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	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
Sr-90	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

\* 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= 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

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 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.
Cs-137	6.053E-09	0.0016	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
Pb-210	1.022E-10	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
Ra-226	3.818E-06	0.9984	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
Sr-90	2.297E-11	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
Total	3.824E-06	1.0000	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



Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	6.053E-09	0.0016										
Ra-226	0.000E+00	0.0000	3.818E-06	0.9984										
Sr-90	0.000E+00	0.0000	2.297E-11	0.0000										
===== Total	0.000E+00	0.0000	3.824E-06	1.0000										

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

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	
Cs-137	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
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	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
Sr-90	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

\* 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+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

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)

Radio-Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Cs-137	5.915E-11	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
Pb-210	6.048E-11	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
Ra-226	2.178E-06	0.9999	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
Sr-90	6.525E-14	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
Total	2.178E-06	1.0000	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



Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	5.915E-11	0.0000										
Ra-226	0.000E+00	0.0000	2.178E-06	1.0000										
Sr-90	0.000E+00	0.0000	6.525E-14	0.0000										
===== Total	0.000E+00	0.0000	2.178E-06	1.0000										

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

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	
Cs-137	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
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	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
Sr-90	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

\* 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= 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

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.
Cs-137	5.456E-18	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
Pb-210	8.479E-12	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
Ra-226	3.053E-07	1.0000	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
Sr-90	7.968E-23	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
Total	3.053E-07	1.0000	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



Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	5.456E-18	0.0000										
Ra-226	0.000E+00	0.0000	3.053E-07	1.0000										
Sr-90	0.000E+00	0.0000	7.968E-23	0.0000										
===== Total	0.000E+00	0.0000	3.053E-07	1.0000										

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

Summary : Parcel C Baseline 2 ft 2032 m2

File : Parcel C Total Baseline 2 ft 2032 m2.rad

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Dose Conversion Factor (and Related) Parameter Summary

File: FGR 13 MORBIDITY

Menu	Parameter	Current Value	Base Case*	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2( 1)
B-1	Pb-210+D	2.320E-02	1.360E-02	DCF2( 2)
B-1	Ra-226+D	8.594E-03	8.580E-03	DCF2( 3)
B-1	Sr-90+D	1.308E-03	1.300E-03	DCF2( 4)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3( 1)
D-1	Pb-210+D	7.276E-03	5.370E-03	DCF3( 2)
D-1	Ra-226+D	1.321E-03	1.320E-03	DCF3( 3)
D-1	Sr-90+D	1.528E-04	1.420E-04	DCF3( 4)
D-34	Food transfer factors:			
D-34	Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF( 1,1)
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF( 1,2)
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF( 1,3)
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF( 2,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF( 2,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF( 2,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF( 3,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF( 3,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF( 3,3)
D-34				
D-34	Sr-90+D , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF( 4,1)
D-34	Sr-90+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-03	8.000E-03	RTF( 4,2)
D-34	Sr-90+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF( 4,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC( 1,1)
D-5	Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC( 1,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC( 2,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC( 2,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC( 3,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC( 3,2)
D-5				
D-5	Sr-90+D , fish	6.000E+01	6.000E+01	BIOFAC( 4,1)
D-5	Sr-90+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC( 4,2)

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

Summary : Parcel C Baseline 2 ft 2032 m2

File : Parcel C Total Baseline 2 ft 2032 m2.rad

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	2.032E+03	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	2.000E+00	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	not used	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T( 2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T( 3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T( 4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T( 5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T( 6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T( 7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T( 8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T( 9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Cs-137	1.130E-01	0.000E+00	---	SI( 1)
R012	Initial principal radionuclide (pCi/g): Ra-226	1.000E+00	0.000E+00	---	SI( 3)
R012	Initial principal radionuclide (pCi/g): Sr-90	3.310E-01	0.000E+00	---	SI( 4)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	WI( 1)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	WI( 3)
R012	Concentration in groundwater (pCi/L): Sr-90	not used	0.000E+00	---	WI( 4)
R013	Cover depth (m)	6.096E-01	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	1.500E+00	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	0.000E+00	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	2.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.000E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	not used	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	not used	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	not used	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	not used	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	not used	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	not used	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	not used	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	not used	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	not used	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	not used	1.000E+01	---	DWIBWT

Summary : Parcel C Baseline 2 ft 2032 m2

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	not used	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	not used	2.500E+02	---	UW
R015	Number of unsaturated zone strata	not used	1	---	NS
R015	Unsat. zone 1, thickness (m)	not used	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	not used	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	not used	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	not used	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	not used	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	not used	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	not used	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	4.600E+03	4.600E+03	---	DCNUCC( 1)
R016	Unsat. zone 1 (cm**3/g)	not used	4.600E+03	---	DCNUCU( 1,1)
R016	Saturated zone (cm**3/g)	not used	4.600E+03	---	DCNUCS( 1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.623E-05	ALEACH( 1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 1)
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC( 3)
R016	Unsat. zone 1 (cm**3/g)	not used	7.000E+01	---	DCNUCU( 3,1)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS( 3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.374E-03	ALEACH( 3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 3)
R016	Distribution coefficients for Sr-90				
R016	Contaminated zone (cm**3/g)	3.000E+01	3.000E+01	---	DCNUCC( 4)
R016	Unsat. zone 1 (cm**3/g)	not used	3.000E+01	---	DCNUCU( 4,1)
R016	Saturated zone (cm**3/g)	not used	3.000E+01	---	DCNUCS( 4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.516E-03	ALEACH( 4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 4)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC( 2)
R016	Unsat. zone 1 (cm**3/g)	not used	1.000E+02	---	DCNUCU( 2,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS( 2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.663E-03	ALEACH( 2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 2)
R017	Inhalation rate (m**3/yr)	7.270E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	2.400E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	9.590E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE( 1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE( 2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE( 3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE( 4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE( 5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE( 6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE( 7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE( 8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE( 9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA( 1)
R017	Ring 2	not used	2.732E-01	---	FRACA( 2)
R017	Ring 3	not used	0.000E+00	---	FRACA( 3)
R017	Ring 4	not used	0.000E+00	---	FRACA( 4)
R017	Ring 5	not used	0.000E+00	---	FRACA( 5)
R017	Ring 6	not used	0.000E+00	---	FRACA( 6)
R017	Ring 7	not used	0.000E+00	---	FRACA( 7)
R017	Ring 8	not used	0.000E+00	---	FRACA( 8)
R017	Ring 9	not used	0.000E+00	---	FRACA( 9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	not used	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	not used	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	not used	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	not used	-1	---	FPLANT
R018	Contamination fraction of meat	not used	-1	---	FMEAT
R018	Contamination fraction of milk	not used	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	not used	5.000E-01	---	LSI

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## Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R019	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	not used	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	not used	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	not used	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	not used	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	not used	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	not used	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	not used	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	not used	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	not used	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
C14	DCF correction factor for gaseous forms of C14	not used	0.000E+00	---	CO2F
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV

Summary : Parcel C Baseline 2 ft 2032 m2

File : Parcel C Total Baseline 2 ft 2032 m2.rad

## Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	257	---	---	KYMAX

## Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	active
2 -- inhalation (w/o radon)	active
3 -- plant ingestion	suppressed
4 -- meat ingestion	suppressed
5 -- milk ingestion	suppressed
6 -- aquatic foods	suppressed
7 -- drinking water	suppressed
8 -- soil ingestion	active
9 -- radon	suppressed
Find peak pathway doses	suppressed

Summary : Parcel C Baseline 2 ft 2032 m2

File : Parcel C Total Baseline 2 ft 2032 m2.rad

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	2032.00 square meters	Cs-137	1.130E-01
Thickness:	2.00 meters	Ra-226	1.000E+00
Cover Depth:	0.61 meters	Sr-90	3.310E-01

Total Dose TDOSE(t), mrem/yr

Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	9.116E-03	9.089E-03	9.036E-03	8.854E-03	8.356E-03	6.847E-03	3.903E-03	5.471E-04
M(t):	3.646E-04	3.636E-04	3.615E-04	3.541E-04	3.342E-04	2.739E-04	1.561E-04	2.188E-05

Maximum TDOSE(t): 9.116E-03 mrem/yr at t = 0.000E+00 years

Summary : Parcel C Baseline 2 ft 2032 m2

File : Parcel C Total Baseline 2 ft 2032 m2.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	5.723E-05	0.0063	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
Ra-226	9.059E-03	0.9937	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
Sr-90	1.398E-07	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
===== Total	9.116E-03	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	5.723E-05	0.0063										
Ra-226	0.000E+00	0.0000	9.059E-03	0.9937										
Sr-90	0.000E+00	0.0000	1.398E-07	0.0000										
===== Total	0.000E+00	0.0000	9.116E-03	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 2 ft 2032 m2

File : Parcel C Total Baseline 2 ft 2032 m2.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	5.592E-05	0.0062	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
Ra-226	9.033E-03	0.9938	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
Sr-90	1.358E-07	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
===== Total	9.089E-03	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	5.592E-05	0.0062										
Ra-226	0.000E+00	0.0000	9.033E-03	0.9938										
Sr-90	0.000E+00	0.0000	1.358E-07	0.0000										
===== Total	0.000E+00	0.0000	9.089E-03	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 2 ft 2032 m2

File : Parcel C Total Baseline 2 ft 2032 m2.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	5.339E-05	0.0059	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
Ra-226	8.983E-03	0.9941	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
Sr-90	1.281E-07	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
===== Total	9.036E-03	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	5.339E-05	0.0059										
Ra-226	0.000E+00	0.0000	8.983E-03	0.9941										
Sr-90	0.000E+00	0.0000	1.281E-07	0.0000										
===== Total	0.000E+00	0.0000	9.036E-03	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 2 ft 2032 m2

File : Parcel C Total Baseline 2 ft 2032 m2.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	4.541E-05	0.0051	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
Ra-226	8.808E-03	0.9949	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
Sr-90	1.043E-07	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
===== Total	8.854E-03	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	4.541E-05	0.0051										
Ra-226	0.000E+00	0.0000	8.808E-03	0.9949										
Sr-90	0.000E+00	0.0000	1.043E-07	0.0000										
===== Total	0.000E+00	0.0000	8.854E-03	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 2 ft 2032 m2

File : Parcel C Total Baseline 2 ft 2032 m2.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	2.858E-05	0.0034	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
Ra-226	8.327E-03	0.9966	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
Sr-90	5.802E-08	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
===== Total	8.356E-03	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	2.858E-05	0.0034										
Ra-226	0.000E+00	0.0000	8.327E-03	0.9966										
Sr-90	0.000E+00	0.0000	5.802E-08	0.0000										
===== Total	0.000E+00	0.0000	8.356E-03	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 2 ft 2032 m2

File : Parcel C Total Baseline 2 ft 2032 m2.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	5.657E-06	0.0008	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
Ra-226	6.842E-03	0.9992	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
Sr-90	7.452E-09	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
===== Total	6.847E-03	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	5.657E-06	0.0008										
Ra-226	0.000E+00	0.0000	6.842E-03	0.9992										
Sr-90	0.000E+00	0.0000	7.452E-09	0.0000										
===== Total	0.000E+00	0.0000	6.847E-03	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 2 ft 2032 m2

File : Parcel C Total Baseline 2 ft 2032 m2.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	5.528E-08	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
Ra-226	3.903E-03	1.0000	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
Sr-90	2.117E-11	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
===== Total	3.903E-03	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	5.528E-08	0.0000										
Ra-226	0.000E+00	0.0000	3.903E-03	1.0000										
Sr-90	0.000E+00	0.0000	2.117E-11	0.0000										
===== Total	0.000E+00	0.0000	3.903E-03	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 2 ft 2032 m2

File : Parcel C Total Baseline 2 ft 2032 m2.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	5.100E-15	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
Ra-226	5.471E-04	1.0000	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
Sr-90	2.584E-20	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
===== Total	5.471E-04	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	5.100E-15	0.0000										
Ra-226	0.000E+00	0.0000	5.471E-04	1.0000										
Sr-90	0.000E+00	0.0000	2.584E-20	0.0000										
===== Total	0.000E+00	0.0000	5.471E-04	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 2 ft 2032 m2

File : Parcel C Total Baseline 2 ft 2032 m2.rad

Dose/Source Ratios Summed Over All Pathways  
 Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137+D	Cs-137+D	1.000E+00	5.065E-04	4.949E-04	4.725E-04	4.018E-04	2.530E-04	5.007E-05	4.892E-07	4.513E-14
Ra-226+D	Ra-226+D	1.000E+00	9.059E-03	9.033E-03	8.983E-03	8.808E-03	8.327E-03	6.842E-03	3.903E-03	5.471E-04
Ra-226+D	Pb-210+D	1.000E+00	4.314E-10	1.274E-09	2.871E-09	7.636E-09	1.603E-08	2.091E-08	1.254E-08	1.759E-09
Ra-226+D	§DSR(j)		9.059E-03	9.033E-03	8.983E-03	8.808E-03	8.327E-03	6.842E-03	3.903E-03	5.471E-04
Sr-90+D	Sr-90+D	1.000E+00	4.224E-07	4.102E-07	3.869E-07	3.151E-07	1.753E-07	2.251E-08	6.394E-11	7.808E-20

§ is used to indicate summation; the Greek sigma is not included in this font.  
 The DSR includes contributions from associated (half-life <= 180 days) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g  
 Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Nuclide (i)	t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137		4.936E+04	5.052E+04	5.291E+04	6.221E+04	9.883E+04	4.993E+05	5.110E+07	*8.704E+13
Ra-226		2.760E+03	2.767E+03	2.783E+03	2.838E+03	3.002E+03	3.654E+03	6.406E+03	4.570E+04
Sr-90		5.918E+07	6.094E+07	6.462E+07	7.934E+07	1.426E+08	1.110E+09	3.910E+11	*1.365E+14

\*At specific activity limit

Summed Dose/Source Ratios DSR(i,t) in (mrem/yr)/(pCi/g)  
 and Single Radionuclide Soil Guidelines G(i,t) in pCi/g  
 at tmin = time of minimum single radionuclide soil guideline  
 and at tmax = time of maximum total dose = 0.000E+00 years

Nuclide (i)	Initial (pCi/g)	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Cs-137	1.130E-01	0.000E+00	5.065E-04	4.936E+04	5.065E-04	4.936E+04
Ra-226	1.000E+00	0.000E+00	9.059E-03	2.760E+03	9.059E-03	2.760E+03
Sr-90	3.310E-01	0.000E+00	4.224E-07	5.918E+07	4.224E-07	5.918E+07

Summary : Parcel C Baseline 2 ft 2032 m2

File : Parcel C Total Baseline 2 ft 2032 m2.rad

Individual Nuclide Dose Summed Over All Pathways  
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	DOSE(j,t), mrem/yr							
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137	Cs-137	1.000E+00	5.723E-05	5.592E-05	5.339E-05	4.541E-05	2.858E-05	5.657E-06	5.528E-08	5.100E-15
Ra-226	Ra-226	1.000E+00	9.059E-03	9.033E-03	8.983E-03	8.808E-03	8.327E-03	6.842E-03	3.903E-03	5.471E-04
Pb-210	Ra-226	1.000E+00	4.314E-10	1.274E-09	2.871E-09	7.636E-09	1.603E-08	2.091E-08	1.254E-08	1.759E-09
Sr-90	Sr-90	1.000E+00	1.398E-07	1.358E-07	1.281E-07	1.043E-07	5.802E-08	7.452E-09	2.117E-11	2.584E-20
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

THF(i) is the thread fraction of the parent nuclide.

\$ is used to indicate summation; the Greek sigma is not included in this font.

Individual Nuclide Soil Concentration  
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g							
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137	Cs-137	1.000E+00	1.130E-01	1.104E-01	1.054E-01	8.966E-02	5.644E-02	1.117E-02	1.092E-04	1.007E-11
Ra-226	Ra-226	1.000E+00	1.000E+00	9.972E-01	9.916E-01	9.723E-01	9.192E-01	7.553E-01	4.308E-01	6.039E-02
Pb-210	Ra-226	1.000E+00	0.000E+00	3.054E-02	8.844E-02	2.612E-01	5.656E-01	7.448E-01	4.472E-01	6.270E-02
Sr-90	Sr-90	1.000E+00	3.310E-01	3.214E-01	3.031E-01	2.469E-01	1.374E-01	1.764E-02	5.010E-05	6.118E-14
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

THF(i) is the thread fraction of the parent nuclide.

\$ is used to indicate summation; the Greek sigma is not included in this font.

RESRAD.EXE execution time = 1.38 seconds

Intrisk : Parcel C Baseline 2 ft 2032 m2

File : Parcel C Total Baseline 2 ft 2032 m2.rad

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Time= 3.000E+00 .....	10
Time= 1.000E+01 .....	13
Time= 3.000E+01 .....	16
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Intrisk : Parcel C Baseline 2 ft 2032 m2

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Cancer Risk Slope Factors Summary Table

Risk Library: FGR 13 Morbidity

Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-1	Ground external radiation slope factors, 1/yr per (pCi/g):			
Sf-1	Cs-137+D	2.55E-06	5.32E-10	SLPF( 1,1)
Sf-1	Pb-210+D	4.21E-09	1.41E-09	SLPF( 2,1)
Sf-1	Ra-226+D	8.49E-06	2.29E-08	SLPF( 3,1)
Sf-1	Sr-90+D	1.96E-08	4.82E-10	SLPF( 4,1)
Sf-2	Inhalation, slope factors, 1/(pCi):			
Sf-2	Cs-137+D	1.12E-10	1.12E-10	SLPF( 1,2)
Sf-2	Pb-210+D	3.08E-08	1.58E-08	SLPF( 2,2)
Sf-2	Ra-226+D	2.83E-08	2.82E-08	SLPF( 3,2)
Sf-2	Sr-90+D	4.33E-10	4.25E-10	SLPF( 4,2)
Sf-3	Food ingestion, slope factors, 1/(pCi):			
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF( 1,3)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF( 2,3)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF( 3,3)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF( 4,3)
Sf-3	Water ingestion, slope factors, 1/(pCi):			
Sf-3	Cs-137+D	3.04E-11	3.04E-11	SLPF( 1,4)
Sf-3	Pb-210+D	2.66E-09	8.81E-10	SLPF( 2,4)
Sf-3	Ra-226+D	3.86E-10	3.85E-10	SLPF( 3,4)
Sf-3	Sr-90+D	7.40E-11	5.59E-11	SLPF( 4,4)
Sf-3	Soil ingestion, slope factors, 1/(pCi):			
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF( 1,5)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF( 2,5)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF( 3,5)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF( 4,5)
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	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)

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

Intrisk : Parcel C Baseline 2 ft 2032 m2

File : Parcel C Total Baseline 2 ft 2032 m2.rad

Risk Slope and Environmental Transport Factors for the Ground Pathway

Nuclide (i)	Slope(i)* t=	ETFG(i,t) At Time in Years (dimensionless)							
		0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
At-218	3.570E-09	1.443E-15	1.443E-15	1.443E-15	1.443E-15	1.443E-15	1.443E-15	1.443E-15	1.443E-15
Ba-137m	2.690E-06	1.502E-04	1.502E-04	1.502E-04	1.502E-04	1.502E-04	1.502E-04	1.502E-04	1.502E-04
Bi-210	2.760E-09	4.352E-06	4.352E-06	4.352E-06	4.352E-06	4.352E-06	4.352E-06	4.352E-06	4.352E-06
Bi-214	7.480E-06	9.202E-04	9.202E-04	9.202E-04	9.202E-04	9.202E-04	9.202E-04	9.202E-04	9.202E-04
Cs-137	5.320E-10	4.736E-07	4.736E-07	4.736E-07	4.736E-07	4.736E-07	4.736E-07	4.736E-07	4.736E-07
Pb-210	1.410E-09	2.038E-20	2.038E-20	2.038E-20	2.038E-20	2.038E-20	2.038E-20	2.038E-20	2.038E-20
Pb-214	9.820E-07	3.450E-05	3.450E-05	3.450E-05	3.450E-05	3.450E-05	3.450E-05	3.450E-05	3.450E-05
Po-210	3.950E-11	2.370E-04	2.370E-04	2.370E-04	2.370E-04	2.370E-04	2.370E-04	2.370E-04	2.370E-04
Po-214	3.860E-10	2.812E-04	2.812E-04	2.812E-04	2.812E-04	2.812E-04	2.812E-04	2.812E-04	2.812E-04
Po-218	4.260E-11	2.818E-04	2.818E-04	2.818E-04	2.818E-04	2.818E-04	2.818E-04	2.818E-04	2.818E-04
Ra-226	2.290E-08	3.892E-06	3.892E-06	3.892E-06	3.892E-06	3.892E-06	3.892E-06	3.892E-06	3.892E-06
Rn-222	1.740E-09	1.134E-04	1.134E-04	1.134E-04	1.134E-04	1.134E-04	1.134E-04	1.134E-04	1.134E-04
Sr-90	4.820E-10	1.443E-07	1.443E-07	1.443E-07	1.443E-07	1.443E-07	1.443E-07	1.443E-07	1.443E-07
Tl-210	0.000E+00	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01
Y-90	1.910E-08	1.792E-05	1.792E-05	1.792E-05	1.792E-05	1.792E-05	1.792E-05	1.792E-05	1.792E-05
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

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

Intrisk : Parcel C Baseline 2 ft 2032 m2

File : Parcel C Total Baseline 2 ft 2032 m2.rad

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		
Cs-137	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	0.000E+00
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	0.000E+00
Ra-226	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	0.000E+00
Sr-90	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	0.000E+00
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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

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= 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.
Cs-137	7.955E-10	0.0049	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
Pb-210	1.462E-13	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
Ra-226	1.606E-07	0.9951	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
Sr-90	1.953E-12	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
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	1.614E-07	1.0000	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



Intrisk : Parcel C Baseline 2 ft 2032 m2

File : Parcel C Total Baseline 2 ft 2032 m2.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	7.955E-10	0.0049										
Ra-226	0.000E+00	0.0000	1.606E-07	0.9951										
Sr-90	0.000E+00	0.0000	1.953E-12	0.0000										
===== Total	0.000E+00	0.0000	1.614E-07	1.0000										

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

Intrisk : Parcel C Baseline 2 ft 2032 m2

File : Parcel C Total Baseline 2 ft 2032 m2.rad

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		
Cs-137	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	0.000E+00
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	0.000E+00
Ra-226	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	0.000E+00
Sr-90	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	0.000E+00
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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= 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

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 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.
Cs-137	7.773E-10	0.0048	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
Pb-210	1.566E-13	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
Ra-226	1.601E-07	0.9952	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
Sr-90	1.897E-12	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
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	1.609E-07	1.0000	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



Intrisk : Parcel C Baseline 2 ft 2032 m2

File : Parcel C Total Baseline 2 ft 2032 m2.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	7.773E-10	0.0048										
Ra-226	0.000E+00	0.0000	1.601E-07	0.9952										
Sr-90	0.000E+00	0.0000	1.897E-12	0.0000										
===== Total	0.000E+00	0.0000	1.609E-07	1.0000										

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

Intrisk : Parcel C Baseline 2 ft 2032 m2

File : Parcel C Total Baseline 2 ft 2032 m2.rad

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	
Cs-137	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
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	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
Sr-90	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
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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

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 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.
Cs-137	7.421E-10	0.0046	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
Pb-210	1.764E-13	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
Ra-226	1.592E-07	0.9953	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
Sr-90	1.789E-12	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
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	1.600E-07	1.0000	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



Intrisk : Parcel C Baseline 2 ft 2032 m2

File : Parcel C Total Baseline 2 ft 2032 m2.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	7.421E-10	0.0046										
Ra-226	0.000E+00	0.0000	1.592E-07	0.9953										
Sr-90	0.000E+00	0.0000	1.789E-12	0.0000										
===== Total	0.000E+00	0.0000	1.600E-07	1.0000										

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

Intrisk : Parcel C Baseline 2 ft 2032 m2

File : Parcel C Total Baseline 2 ft 2032 m2.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		
Cs-137	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	0.000E+00
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	0.000E+00
Ra-226	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	0.000E+00
Sr-90	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	0.000E+00
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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= 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

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.
Cs-137	6.312E-10	0.0040	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
Pb-210	2.349E-13	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
Ra-226	1.561E-07	0.9960	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
Sr-90	1.457E-12	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
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	1.567E-07	1.0000	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



Intrisk : Parcel C Baseline 2 ft 2032 m2

File : Parcel C Total Baseline 2 ft 2032 m2.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	6.312E-10	0.0040										
Ra-226	0.000E+00	0.0000	1.561E-07	0.9960										
Sr-90	0.000E+00	0.0000	1.457E-12	0.0000										
===== Total	0.000E+00	0.0000	1.567E-07	1.0000										

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

Intrisk : Parcel C Baseline 2 ft 2032 m2

File : Parcel C Total Baseline 2 ft 2032 m2.rad

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As pCi/yr at t= 3.000E+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		
Cs-137	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	0.000E+00
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	0.000E+00
Ra-226	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	0.000E+00
Sr-90	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	0.000E+00
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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+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

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p) and Fraction of Total Risk at t= 3.000E+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.
Cs-137	3.973E-10	0.0027	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
Pb-210	3.353E-13	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
Ra-226	1.476E-07	0.9973	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
Sr-90	8.104E-13	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
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	1.480E-07	1.0000	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



Intrisk : Parcel C Baseline 2 ft 2032 m2

File : Parcel C Total Baseline 2 ft 2032 m2.rad

Total Excess Cancer Risk CNRSI(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.										
Cs-137	0.000E+00	0.0000	3.973E-10	0.0027										
Ra-226	0.000E+00	0.0000	1.476E-07	0.9973										
Sr-90	0.000E+00	0.0000	8.104E-13	0.0000										
===== Total	0.000E+00	0.0000	1.480E-07	1.0000										

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

Intrisk : Parcel C Baseline 2 ft 2032 m2

File : Parcel C Total Baseline 2 ft 2032 m2.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	
Cs-137	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
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	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
Sr-90	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
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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= 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

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.
Cs-137	7.864E-11	0.0006	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
Pb-210	3.750E-13	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
Ra-226	1.213E-07	0.9993	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
Sr-90	1.041E-13	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
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	1.213E-07	1.0000	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



Intrisk : Parcel C Baseline 2 ft 2032 m2

File : Parcel C Total Baseline 2 ft 2032 m2.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	7.864E-11	0.0006										
Ra-226	0.000E+00	0.0000	1.213E-07	0.9994										
Sr-90	0.000E+00	0.0000	1.041E-13	0.0000										
===== Total	0.000E+00	0.0000	1.213E-07	1.0000										

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

Intrisk : Parcel C Baseline 2 ft 2032 m2

File : Parcel C Total Baseline 2 ft 2032 m2.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		
Cs-137	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	0.000E+00
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	0.000E+00
Ra-226	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	0.000E+00
Sr-90	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	0.000E+00
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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+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

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)

Radio-Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Cs-137	7.685E-13	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
Pb-210	2.219E-13	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
Ra-226	6.917E-08	1.0000	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
Sr-90	2.956E-16	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
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	6.917E-08	1.0000	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



Intrisk : Parcel C Baseline 2 ft 2032 m2

File : Parcel C Total Baseline 2 ft 2032 m2.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	7.685E-13	0.0000										
Ra-226	0.000E+00	0.0000	6.917E-08	1.0000										
Sr-90	0.000E+00	0.0000	2.956E-16	0.0000										
===== Total	0.000E+00	0.0000	6.917E-08	1.0000										

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

Intrisk : Parcel C Baseline 2 ft 2032 m2

File : Parcel C Total Baseline 2 ft 2032 m2.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		
Cs-137	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	0.000E+00
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	0.000E+00
Ra-226	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	0.000E+00
Sr-90	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	0.000E+00
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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= 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

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.
Cs-137	7.089E-20	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
Pb-210	3.110E-14	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
Ra-226	9.696E-09	1.0000	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
Sr-90	3.610E-25	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
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	9.696E-09	1.0000	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



Intrisk : Parcel C Baseline 2 ft 2032 m2

File : Parcel C Total Baseline 2 ft 2032 m2.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	7.089E-20	0.0000										
Ra-226	0.000E+00	0.0000	9.696E-09	1.0000										
Sr-90	0.000E+00	0.0000	3.610E-25	0.0000										
===== Total	0.000E+00	0.0000	9.696E-09	1.0000										

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

Summary : Parcel C Baseline 2 ft 232 m2

File : Parcel C Total Baseline 2 ft 232 m2.rad

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Summary : Parcel C Baseline 2 ft 232 m2

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Dose Conversion Factor (and Related) Parameter Summary

File: FGR 13 MORBIDITY

Menu	Parameter	Current Value	Base Case*	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2( 1)
B-1	Pb-210+D	2.320E-02	1.360E-02	DCF2( 2)
B-1	Ra-226+D	8.594E-03	8.580E-03	DCF2( 3)
B-1	Sr-90+D	1.308E-03	1.300E-03	DCF2( 4)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3( 1)
D-1	Pb-210+D	7.276E-03	5.370E-03	DCF3( 2)
D-1	Ra-226+D	1.321E-03	1.320E-03	DCF3( 3)
D-1	Sr-90+D	1.528E-04	1.420E-04	DCF3( 4)
D-34	Food transfer factors:			
D-34	Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF( 1,1)
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF( 1,2)
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF( 1,3)
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF( 2,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF( 2,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF( 2,3)
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF( 3,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF( 3,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF( 3,3)
D-34	Sr-90+D , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF( 4,1)
D-34	Sr-90+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-03	8.000E-03	RTF( 4,2)
D-34	Sr-90+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF( 4,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC( 1,1)
D-5	Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC( 1,2)
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC( 2,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC( 2,2)
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC( 3,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC( 3,2)
D-5	Sr-90+D , fish	6.000E+01	6.000E+01	BIOFAC( 4,1)
D-5	Sr-90+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC( 4,2)

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

Summary : Parcel C Baseline 2 ft 232 m2

File : Parcel C Total Baseline 2 ft 232 m2.rad

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	2.320E+02	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	2.000E+00	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	not used	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T( 2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T( 3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T( 4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T( 5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T( 6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T( 7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T( 8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T( 9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Cs-137	1.130E-01	0.000E+00	---	SI( 1)
R012	Initial principal radionuclide (pCi/g): Ra-226	1.000E+00	0.000E+00	---	SI( 3)
R012	Initial principal radionuclide (pCi/g): Sr-90	3.310E-01	0.000E+00	---	SI( 4)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	WI( 1)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	WI( 3)
R012	Concentration in groundwater (pCi/L): Sr-90	not used	0.000E+00	---	WI( 4)
R013	Cover depth (m)	6.096E-01	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	1.500E+00	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	0.000E+00	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	2.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.000E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	not used	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	not used	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	not used	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	not used	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	not used	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	not used	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	not used	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	not used	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	not used	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	not used	1.000E+01	---	DWIBWT

Summary : Parcel C Baseline 2 ft 232 m2

File : Parcel C Total Baseline 2 ft 232 m2.rad

## Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	not used	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	not used	2.500E+02	---	UW
R015	Number of unsaturated zone strata	not used	1	---	NS
R015	Unsat. zone 1, thickness (m)	not used	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	not used	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	not used	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	not used	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	not used	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	not used	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	not used	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	4.600E+03	4.600E+03	---	DCNUCC( 1)
R016	Unsaturated zone 1 (cm**3/g)	not used	4.600E+03	---	DCNUCU( 1,1)
R016	Saturated zone (cm**3/g)	not used	4.600E+03	---	DCNUCS( 1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.623E-05	ALEACH( 1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 1)
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC( 3)
R016	Unsaturated zone 1 (cm**3/g)	not used	7.000E+01	---	DCNUCU( 3,1)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS( 3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.374E-03	ALEACH( 3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 3)
R016	Distribution coefficients for Sr-90				
R016	Contaminated zone (cm**3/g)	3.000E+01	3.000E+01	---	DCNUCC( 4)
R016	Unsaturated zone 1 (cm**3/g)	not used	3.000E+01	---	DCNUCU( 4,1)
R016	Saturated zone (cm**3/g)	not used	3.000E+01	---	DCNUCS( 4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.516E-03	ALEACH( 4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 4)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC( 2)
R016	Unsaturated zone 1 (cm**3/g)	not used	1.000E+02	---	DCNUCU( 2,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS( 2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.663E-03	ALEACH( 2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 2)
R017	Inhalation rate (m**3/yr)	7.270E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	2.400E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	9.590E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS

Summary : Parcel C Baseline 2 ft 232 m2

File : Parcel C Total Baseline 2 ft 232 m2.rad

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE( 1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE( 2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE( 3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE( 4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE( 5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE( 6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE( 7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE( 8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE( 9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA( 1)
R017	Ring 2	not used	2.732E-01	---	FRACA( 2)
R017	Ring 3	not used	0.000E+00	---	FRACA( 3)
R017	Ring 4	not used	0.000E+00	---	FRACA( 4)
R017	Ring 5	not used	0.000E+00	---	FRACA( 5)
R017	Ring 6	not used	0.000E+00	---	FRACA( 6)
R017	Ring 7	not used	0.000E+00	---	FRACA( 7)
R017	Ring 8	not used	0.000E+00	---	FRACA( 8)
R017	Ring 9	not used	0.000E+00	---	FRACA( 9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	not used	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	not used	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	not used	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	not used	-1	---	FPLANT
R018	Contamination fraction of meat	not used	-1	---	FMEAT
R018	Contamination fraction of milk	not used	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	not used	5.000E-01	---	LSI

Summary : Parcel C Baseline 2 ft 232 m2

File : Parcel C Total Baseline 2 ft 232 m2.rad

## Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R019	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	not used	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	not used	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	not used	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	not used	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	not used	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	not used	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	not used	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	not used	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	not used	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
C14	DCF correction factor for gaseous forms of C14	not used	0.000E+00	---	CO2F
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV

Summary : Parcel C Baseline 2 ft 232 m2

File : Parcel C Total Baseline 2 ft 232 m2.rad

## Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	257	---	---	KYMAX

## Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	active
2 -- inhalation (w/o radon)	active
3 -- plant ingestion	suppressed
4 -- meat ingestion	suppressed
5 -- milk ingestion	suppressed
6 -- aquatic foods	suppressed
7 -- drinking water	suppressed
8 -- soil ingestion	active
9 -- radon	suppressed
Find peak pathway doses	suppressed

Summary : Parcel C Baseline 2 ft 232 m2

File : Parcel C Total Baseline 2 ft 232 m2.rad

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	232.00 square meters	Cs-137	1.130E-01
Thickness:	2.00 meters	Ra-226	1.000E+00
Cover Depth:	0.61 meters	Sr-90	3.310E-01

Total Dose TDOSE(t), mrem/yr

Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	9.116E-03	9.089E-03	9.036E-03	8.854E-03	8.356E-03	6.847E-03	3.903E-03	5.471E-04
M(t):	3.646E-04	3.636E-04	3.615E-04	3.541E-04	3.342E-04	2.739E-04	1.561E-04	2.188E-05

Maximum TDOSE(t): 9.116E-03 mrem/yr at t = 0.000E+00 years

Summary : Parcel C Baseline 2 ft 232 m2

File : Parcel C Total Baseline 2 ft 232 m2.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	5.723E-05	0.0063	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
Ra-226	9.059E-03	0.9937	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
Sr-90	1.398E-07	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
===== Total	9.116E-03	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	5.723E-05	0.0063										
Ra-226	0.000E+00	0.0000	9.059E-03	0.9937										
Sr-90	0.000E+00	0.0000	1.398E-07	0.0000										
===== Total	0.000E+00	0.0000	9.116E-03	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 2 ft 232 m2

File : Parcel C Total Baseline 2 ft 232 m2.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	5.592E-05	0.0062	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
Ra-226	9.033E-03	0.9938	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
Sr-90	1.358E-07	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
===== Total	9.089E-03	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	5.592E-05	0.0062										
Ra-226	0.000E+00	0.0000	9.033E-03	0.9938										
Sr-90	0.000E+00	0.0000	1.358E-07	0.0000										
===== Total	0.000E+00	0.0000	9.089E-03	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 2 ft 232 m2

File : Parcel C Total Baseline 2 ft 232 m2.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	5.339E-05	0.0059	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
Ra-226	8.983E-03	0.9941	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
Sr-90	1.281E-07	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
===== Total	9.036E-03	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	5.339E-05	0.0059										
Ra-226	0.000E+00	0.0000	8.983E-03	0.9941										
Sr-90	0.000E+00	0.0000	1.281E-07	0.0000										
===== Total	0.000E+00	0.0000	9.036E-03	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 2 ft 232 m2

File : Parcel C Total Baseline 2 ft 232 m2.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	4.541E-05	0.0051	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
Ra-226	8.808E-03	0.9949	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
Sr-90	1.043E-07	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
===== Total	8.854E-03	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	4.541E-05	0.0051										
Ra-226	0.000E+00	0.0000	8.808E-03	0.9949										
Sr-90	0.000E+00	0.0000	1.043E-07	0.0000										
===== Total	0.000E+00	0.0000	8.854E-03	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 2 ft 232 m2

File : Parcel C Total Baseline 2 ft 232 m2.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	2.858E-05	0.0034	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
Ra-226	8.327E-03	0.9966	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
Sr-90	5.802E-08	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
===== Total	8.356E-03	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	2.858E-05	0.0034										
Ra-226	0.000E+00	0.0000	8.327E-03	0.9966										
Sr-90	0.000E+00	0.0000	5.802E-08	0.0000										
===== Total	0.000E+00	0.0000	8.356E-03	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 2 ft 232 m2

File : Parcel C Total Baseline 2 ft 232 m2.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	5.657E-06	0.0008	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
Ra-226	6.842E-03	0.9992	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
Sr-90	7.452E-09	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
===== Total	6.847E-03	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	5.657E-06	0.0008										
Ra-226	0.000E+00	0.0000	6.842E-03	0.9992										
Sr-90	0.000E+00	0.0000	7.452E-09	0.0000										
===== Total	0.000E+00	0.0000	6.847E-03	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 2 ft 232 m2

File : Parcel C Total Baseline 2 ft 232 m2.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	5.528E-08	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
Ra-226	3.903E-03	1.0000	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
Sr-90	2.117E-11	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
===== Total	3.903E-03	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	5.528E-08	0.0000										
Ra-226	0.000E+00	0.0000	3.903E-03	1.0000										
Sr-90	0.000E+00	0.0000	2.117E-11	0.0000										
===== Total	0.000E+00	0.0000	3.903E-03	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 2 ft 232 m2

File : Parcel C Total Baseline 2 ft 232 m2.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	5.100E-15	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
Ra-226	5.471E-04	1.0000	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
Sr-90	2.584E-20	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
===== Total	5.471E-04	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	5.100E-15	0.0000										
Ra-226	0.000E+00	0.0000	5.471E-04	1.0000										
Sr-90	0.000E+00	0.0000	2.584E-20	0.0000										
===== Total	0.000E+00	0.0000	5.471E-04	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 2 ft 232 m2

File : Parcel C Total Baseline 2 ft 232 m2.rad

Dose/Source Ratios Summed Over All Pathways  
 Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137+D	Cs-137+D	1.000E+00	5.065E-04	4.949E-04	4.725E-04	4.018E-04	2.530E-04	5.007E-05	4.892E-07	4.513E-14
Ra-226+D	Ra-226+D	1.000E+00	9.059E-03	9.033E-03	8.983E-03	8.808E-03	8.327E-03	6.842E-03	3.903E-03	5.471E-04
Ra-226+D	Pb-210+D	1.000E+00	4.314E-10	1.274E-09	2.871E-09	7.636E-09	1.603E-08	2.091E-08	1.254E-08	1.759E-09
Ra-226+D	§DSR(j)		9.059E-03	9.033E-03	8.983E-03	8.808E-03	8.327E-03	6.842E-03	3.903E-03	5.471E-04
Sr-90+D	Sr-90+D	1.000E+00	4.224E-07	4.102E-07	3.869E-07	3.151E-07	1.753E-07	2.251E-08	6.394E-11	7.808E-20

§ is used to indicate summation; the Greek sigma is not included in this font.  
 The DSR includes contributions from associated (half-life <= 180 days) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g  
 Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Nuclide (i)	t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137		4.936E+04	5.052E+04	5.291E+04	6.221E+04	9.883E+04	4.993E+05	5.110E+07	*8.704E+13
Ra-226		2.760E+03	2.767E+03	2.783E+03	2.838E+03	3.002E+03	3.654E+03	6.406E+03	4.570E+04
Sr-90		5.918E+07	6.094E+07	6.462E+07	7.934E+07	1.426E+08	1.110E+09	3.910E+11	*1.365E+14

\*At specific activity limit

Summed Dose/Source Ratios DSR(i,t) in (mrem/yr)/(pCi/g)  
 and Single Radionuclide Soil Guidelines G(i,t) in pCi/g  
 at tmin = time of minimum single radionuclide soil guideline  
 and at tmax = time of maximum total dose = 0.000E+00 years

Nuclide (i)	Initial (pCi/g)	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Cs-137	1.130E-01	0.000E+00	5.065E-04	4.936E+04	5.065E-04	4.936E+04
Ra-226	1.000E+00	0.000E+00	9.059E-03	2.760E+03	9.059E-03	2.760E+03
Sr-90	3.310E-01	0.000E+00	4.224E-07	5.918E+07	4.224E-07	5.918E+07

Summary : Parcel C Baseline 2 ft 232 m2

File : Parcel C Total Baseline 2 ft 232 m2.rad

Individual Nuclide Dose Summed Over All Pathways  
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	DOSE(j,t), mrem/yr							
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137	Cs-137	1.000E+00	5.723E-05	5.592E-05	5.339E-05	4.541E-05	2.858E-05	5.657E-06	5.528E-08	5.100E-15
Ra-226	Ra-226	1.000E+00	9.059E-03	9.033E-03	8.983E-03	8.808E-03	8.327E-03	6.842E-03	3.903E-03	5.471E-04
Pb-210	Ra-226	1.000E+00	4.314E-10	1.274E-09	2.871E-09	7.636E-09	1.603E-08	2.091E-08	1.254E-08	1.759E-09
Sr-90	Sr-90	1.000E+00	1.398E-07	1.358E-07	1.281E-07	1.043E-07	5.802E-08	7.452E-09	2.117E-11	2.584E-20
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

THF(i) is the thread fraction of the parent nuclide.

\$ is used to indicate summation; the Greek sigma is not included in this font.

Individual Nuclide Soil Concentration  
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g							
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137	Cs-137	1.000E+00	1.130E-01	1.104E-01	1.054E-01	8.966E-02	5.644E-02	1.117E-02	1.092E-04	1.007E-11
Ra-226	Ra-226	1.000E+00	1.000E+00	9.972E-01	9.916E-01	9.723E-01	9.192E-01	7.553E-01	4.308E-01	6.039E-02
Pb-210	Ra-226	1.000E+00	0.000E+00	3.054E-02	8.844E-02	2.612E-01	5.656E-01	7.448E-01	4.472E-01	6.270E-02
Sr-90	Sr-90	1.000E+00	3.310E-01	3.214E-01	3.031E-01	2.469E-01	1.374E-01	1.764E-02	5.010E-05	6.118E-14
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

THF(i) is the thread fraction of the parent nuclide.

\$ is used to indicate summation; the Greek sigma is not included in this font.

RESCALC.EXE execution time = 1.42 seconds

Intrisk : Parcel C Baseline 2 ft 232 m2

File : Parcel C Total Baseline 2 ft 232 m2.rad

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Time= 1.000E+01 .....	13
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Intrisk : Parcel C Baseline 2 ft 232 m2

File : Parcel C Total Baseline 2 ft 232 m2.rad

Cancer Risk Slope Factors Summary Table  
 Risk Library: FGR 13 Morbidity

Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-1	Ground external radiation slope factors, 1/yr per (pCi/g):			
Sf-1	Cs-137+D	2.55E-06	5.32E-10	SLPF( 1,1)
Sf-1	Pb-210+D	4.21E-09	1.41E-09	SLPF( 2,1)
Sf-1	Ra-226+D	8.49E-06	2.29E-08	SLPF( 3,1)
Sf-1	Sr-90+D	1.96E-08	4.82E-10	SLPF( 4,1)
Sf-2	Inhalation, slope factors, 1/(pCi):			
Sf-2	Cs-137+D	1.12E-10	1.12E-10	SLPF( 1,2)
Sf-2	Pb-210+D	3.08E-08	1.58E-08	SLPF( 2,2)
Sf-2	Ra-226+D	2.83E-08	2.82E-08	SLPF( 3,2)
Sf-2	Sr-90+D	4.33E-10	4.25E-10	SLPF( 4,2)
Sf-3	Food ingestion, slope factors, 1/(pCi):			
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF( 1,3)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF( 2,3)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF( 3,3)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF( 4,3)
Sf-3	Water ingestion, slope factors, 1/(pCi):			
Sf-3	Cs-137+D	3.04E-11	3.04E-11	SLPF( 1,4)
Sf-3	Pb-210+D	2.66E-09	8.81E-10	SLPF( 2,4)
Sf-3	Ra-226+D	3.86E-10	3.85E-10	SLPF( 3,4)
Sf-3	Sr-90+D	7.40E-11	5.59E-11	SLPF( 4,4)
Sf-3	Soil ingestion, slope factors, 1/(pCi):			
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF( 1,5)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF( 2,5)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF( 3,5)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF( 4,5)
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	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)

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

Intrisk : Parcel C Baseline 2 ft 232 m2

File : Parcel C Total Baseline 2 ft 232 m2.rad

Risk Slope and Environmental Transport Factors for the Ground Pathway

Nuclide (i)	Slope(i)* t=	ETFG(i,t) At Time in Years (dimensionless)							
		0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
At-218	3.570E-09	1.443E-15	1.443E-15	1.443E-15	1.443E-15	1.443E-15	1.443E-15	1.443E-15	1.443E-15
Ba-137m	2.690E-06	1.502E-04	1.502E-04	1.502E-04	1.502E-04	1.502E-04	1.502E-04	1.502E-04	1.502E-04
Bi-210	2.760E-09	4.352E-06	4.352E-06	4.352E-06	4.352E-06	4.352E-06	4.352E-06	4.352E-06	4.352E-06
Bi-214	7.480E-06	9.202E-04	9.202E-04	9.202E-04	9.202E-04	9.202E-04	9.202E-04	9.202E-04	9.202E-04
Cs-137	5.320E-10	4.736E-07	4.736E-07	4.736E-07	4.736E-07	4.736E-07	4.736E-07	4.736E-07	4.736E-07
Pb-210	1.410E-09	2.038E-20	2.038E-20	2.038E-20	2.038E-20	2.038E-20	2.038E-20	2.038E-20	2.038E-20
Pb-214	9.820E-07	3.450E-05	3.450E-05	3.450E-05	3.450E-05	3.450E-05	3.450E-05	3.450E-05	3.450E-05
Po-210	3.950E-11	2.370E-04	2.370E-04	2.370E-04	2.370E-04	2.370E-04	2.370E-04	2.370E-04	2.370E-04
Po-214	3.860E-10	2.812E-04	2.812E-04	2.812E-04	2.812E-04	2.812E-04	2.812E-04	2.812E-04	2.812E-04
Po-218	4.260E-11	2.818E-04	2.818E-04	2.818E-04	2.818E-04	2.818E-04	2.818E-04	2.818E-04	2.818E-04
Ra-226	2.290E-08	3.892E-06	3.892E-06	3.892E-06	3.892E-06	3.892E-06	3.892E-06	3.892E-06	3.892E-06
Rn-222	1.740E-09	1.134E-04	1.134E-04	1.134E-04	1.134E-04	1.134E-04	1.134E-04	1.134E-04	1.134E-04
Sr-90	4.820E-10	1.443E-07	1.443E-07	1.443E-07	1.443E-07	1.443E-07	1.443E-07	1.443E-07	1.443E-07
Tl-210	0.000E+00	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01
Y-90	1.910E-08	1.792E-05	1.792E-05	1.792E-05	1.792E-05	1.792E-05	1.792E-05	1.792E-05	1.792E-05
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

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

Intrisk : Parcel C Baseline 2 ft 232 m2

File : Parcel C Total Baseline 2 ft 232 m2.rad

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		
Cs-137	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	0.000E+00
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	0.000E+00
Ra-226	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	0.000E+00
Sr-90	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	0.000E+00
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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

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= 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.
Cs-137	7.955E-10	0.0049	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
Pb-210	1.462E-13	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
Ra-226	1.606E-07	0.9951	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
Sr-90	1.953E-12	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
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	1.614E-07	1.0000	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



Intrisk : Parcel C Baseline 2 ft 232 m2

File : Parcel C Total Baseline 2 ft 232 m2.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	7.955E-10	0.0049										
Ra-226	0.000E+00	0.0000	1.606E-07	0.9951										
Sr-90	0.000E+00	0.0000	1.953E-12	0.0000										
===== Total	0.000E+00	0.0000	1.614E-07	1.0000										

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

Intrisk : Parcel C Baseline 2 ft 232 m2

File : Parcel C Total Baseline 2 ft 232 m2.rad

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		
Cs-137	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	0.000E+00
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	0.000E+00
Ra-226	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	0.000E+00
Sr-90	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	0.000E+00
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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= 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

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 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.
Cs-137	7.773E-10	0.0048	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
Pb-210	1.566E-13	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
Ra-226	1.601E-07	0.9952	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
Sr-90	1.897E-12	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
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	1.609E-07	1.0000	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



Intrisk : Parcel C Baseline 2 ft 232 m2

File : Parcel C Total Baseline 2 ft 232 m2.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	7.773E-10	0.0048										
Ra-226	0.000E+00	0.0000	1.601E-07	0.9952										
Sr-90	0.000E+00	0.0000	1.897E-12	0.0000										
===== Total	0.000E+00	0.0000	1.609E-07	1.0000										

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

Intrisk : Parcel C Baseline 2 ft 232 m2

File : Parcel C Total Baseline 2 ft 232 m2.rad

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		
Cs-137	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	0.000E+00
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	0.000E+00
Ra-226	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	0.000E+00
Sr-90	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	0.000E+00
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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

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.
Cs-137	7.421E-10	0.0046	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
Pb-210	1.764E-13	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
Ra-226	1.592E-07	0.9953	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
Sr-90	1.789E-12	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
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	1.600E-07	1.0000	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



Intrisk : Parcel C Baseline 2 ft 232 m2

File : Parcel C Total Baseline 2 ft 232 m2.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	7.421E-10	0.0046										
Ra-226	0.000E+00	0.0000	1.592E-07	0.9953										
Sr-90	0.000E+00	0.0000	1.789E-12	0.0000										
===== Total	0.000E+00	0.0000	1.600E-07	1.0000										

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

Intrisk : Parcel C Baseline 2 ft 232 m2

File : Parcel C Total Baseline 2 ft 232 m2.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		
Cs-137	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	0.000E+00
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	0.000E+00
Ra-226	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	0.000E+00
Sr-90	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	0.000E+00
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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= 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

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.
Cs-137	6.312E-10	0.0040	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
Pb-210	2.349E-13	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
Ra-226	1.561E-07	0.9960	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
Sr-90	1.457E-12	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
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	1.567E-07	1.0000	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



Intrisk : Parcel C Baseline 2 ft 232 m2

File : Parcel C Total Baseline 2 ft 232 m2.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	6.312E-10	0.0040										
Ra-226	0.000E+00	0.0000	1.561E-07	0.9960										
Sr-90	0.000E+00	0.0000	1.457E-12	0.0000										
===== Total	0.000E+00	0.0000	1.567E-07	1.0000										

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

Intrisk : Parcel C Baseline 2 ft 232 m2

File : Parcel C Total Baseline 2 ft 232 m2.rad

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As pCi/yr at t= 3.000E+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		
Cs-137	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	0.000E+00
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	0.000E+00
Ra-226	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	0.000E+00
Sr-90	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	0.000E+00
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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+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

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p) and Fraction of Total Risk at t= 3.000E+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.
Cs-137	3.973E-10	0.0027	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
Pb-210	3.353E-13	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
Ra-226	1.476E-07	0.9973	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
Sr-90	8.104E-13	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
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	1.480E-07	1.0000	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



Intrisk : Parcel C Baseline 2 ft 232 m2

File : Parcel C Total Baseline 2 ft 232 m2.rad

Total Excess Cancer Risk CNRSI(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.										
Cs-137	0.000E+00	0.0000	3.973E-10	0.0027										
Ra-226	0.000E+00	0.0000	1.476E-07	0.9973										
Sr-90	0.000E+00	0.0000	8.104E-13	0.0000										
===== Total	0.000E+00	0.0000	1.480E-07	1.0000										

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

Intrisk : Parcel C Baseline 2 ft 232 m2

File : Parcel C Total Baseline 2 ft 232 m2.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		
Cs-137	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	0.000E+00
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	0.000E+00
Ra-226	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	0.000E+00
Sr-90	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	0.000E+00
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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= 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

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.
Cs-137	7.864E-11	0.0006	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
Pb-210	3.750E-13	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
Ra-226	1.213E-07	0.9993	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
Sr-90	1.041E-13	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
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	1.213E-07	1.0000	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



Intrisk : Parcel C Baseline 2 ft 232 m2

File : Parcel C Total Baseline 2 ft 232 m2.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	7.864E-11	0.0006										
Ra-226	0.000E+00	0.0000	1.213E-07	0.9994										
Sr-90	0.000E+00	0.0000	1.041E-13	0.0000										
===== Total	0.000E+00	0.0000	1.213E-07	1.0000										

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

Intrisk : Parcel C Baseline 2 ft 232 m2

File : Parcel C Total Baseline 2 ft 232 m2.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		
Cs-137	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	0.000E+00
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	0.000E+00
Ra-226	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	0.000E+00
Sr-90	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	0.000E+00

\* 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+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

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)

Radio-Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Cs-137	7.685E-13	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
Pb-210	2.219E-13	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
Ra-226	6.917E-08	1.0000	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
Sr-90	2.956E-16	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
Total	6.917E-08	1.0000	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



Intrisk : Parcel C Baseline 2 ft 232 m2

File : Parcel C Total Baseline 2 ft 232 m2.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	7.685E-13	0.0000										
Ra-226	0.000E+00	0.0000	6.917E-08	1.0000										
Sr-90	0.000E+00	0.0000	2.956E-16	0.0000										
===== Total	0.000E+00	0.0000	6.917E-08	1.0000										

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

Intrisk : Parcel C Baseline 2 ft 232 m2

File : Parcel C Total Baseline 2 ft 232 m2.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		
Cs-137	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	0.000E+00
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	0.000E+00
Ra-226	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	0.000E+00
Sr-90	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	0.000E+00
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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= 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

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.
Cs-137	7.089E-20	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
Pb-210	3.110E-14	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
Ra-226	9.696E-09	1.0000	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
Sr-90	3.610E-25	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
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	9.696E-09	1.0000	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



Intrisk : Parcel C Baseline 2 ft 232 m2

File : Parcel C Total Baseline 2 ft 232 m2.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	7.089E-20	0.0000										
Ra-226	0.000E+00	0.0000	9.696E-09	1.0000										
Sr-90	0.000E+00	0.0000	3.610E-25	0.0000										
===== Total	0.000E+00	0.0000	9.696E-09	1.0000										

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

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Dose Conversion Factor (and Related) Parameter Summary  
 File: FGR 13 MORBIDITY

Menu	Parameter	Current Value	Base Case*	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2( 1)
B-1	Pb-210+D	2.320E-02	1.360E-02	DCF2( 2)
B-1	Ra-226+D	8.594E-03	8.580E-03	DCF2( 3)
B-1	Sr-90+D	1.308E-03	1.300E-03	DCF2( 4)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3( 1)
D-1	Pb-210+D	7.276E-03	5.370E-03	DCF3( 2)
D-1	Ra-226+D	1.321E-03	1.320E-03	DCF3( 3)
D-1	Sr-90+D	1.528E-04	1.420E-04	DCF3( 4)
D-34	Food transfer factors:			
D-34	Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF( 1,1)
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF( 1,2)
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF( 1,3)
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF( 2,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF( 2,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF( 2,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF( 3,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF( 3,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF( 3,3)
D-34				
D-34	Sr-90+D , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF( 4,1)
D-34	Sr-90+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-03	8.000E-03	RTF( 4,2)
D-34	Sr-90+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF( 4,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC( 1,1)
D-5	Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC( 1,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC( 2,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC( 2,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC( 3,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC( 3,2)
D-5				
D-5	Sr-90+D , fish	6.000E+01	6.000E+01	BIOFAC( 4,1)
D-5	Sr-90+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC( 4,2)

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

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.000E+04	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	2.000E+00	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	not used	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T( 2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T( 3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T( 4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T( 5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T( 6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T( 7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T( 8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T( 9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Cs-137	1.130E-01	0.000E+00	---	SI( 1)
R012	Initial principal radionuclide (pCi/g): Ra-226	1.000E+00	0.000E+00	---	SI( 3)
R012	Initial principal radionuclide (pCi/g): Sr-90	3.310E-01	0.000E+00	---	SI( 4)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	WI( 1)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	WI( 3)
R012	Concentration in groundwater (pCi/L): Sr-90	not used	0.000E+00	---	WI( 4)
R013	Cover depth (m)	6.096E-01	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	1.500E+00	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	0.000E+00	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	2.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.000E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	not used	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	not used	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	not used	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	not used	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	not used	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	not used	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	not used	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	not used	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	not used	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	not used	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	not used	ND	---	MODEL

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R014	Well pumping rate (m**3/yr)	not used	2.500E+02	---	UW
R015	Number of unsaturated zone strata	not used	1	---	NS
R015	Unsat. zone 1, thickness (m)	not used	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	not used	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	not used	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	not used	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	not used	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	not used	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	not used	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	4.600E+03	4.600E+03	---	DCNUCC( 1)
R016	Unsat. zone 1 (cm**3/g)	not used	4.600E+03	---	DCNUCU( 1,1)
R016	Saturated zone (cm**3/g)	not used	4.600E+03	---	DCNUCS( 1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.623E-05	ALEACH( 1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 1)
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC( 3)
R016	Unsat. zone 1 (cm**3/g)	not used	7.000E+01	---	DCNUCU( 3,1)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS( 3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.374E-03	ALEACH( 3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 3)
R016	Distribution coefficients for Sr-90				
R016	Contaminated zone (cm**3/g)	3.000E+01	3.000E+01	---	DCNUCC( 4)
R016	Unsat. zone 1 (cm**3/g)	not used	3.000E+01	---	DCNUCU( 4,1)
R016	Saturated zone (cm**3/g)	not used	3.000E+01	---	DCNUCS( 4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.516E-03	ALEACH( 4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 4)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC( 2)
R016	Unsat. zone 1 (cm**3/g)	not used	1.000E+02	---	DCNUCU( 2,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS( 2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.663E-03	ALEACH( 2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 2)
R017	Inhalation rate (m**3/yr)	7.270E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	2.400E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	9.590E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE( 1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE( 2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE( 3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE( 4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE( 5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE( 6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE( 7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE( 8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE( 9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA( 1)
R017	Ring 2	not used	2.732E-01	---	FRACA( 2)
R017	Ring 3	not used	0.000E+00	---	FRACA( 3)
R017	Ring 4	not used	0.000E+00	---	FRACA( 4)
R017	Ring 5	not used	0.000E+00	---	FRACA( 5)
R017	Ring 6	not used	0.000E+00	---	FRACA( 6)
R017	Ring 7	not used	0.000E+00	---	FRACA( 7)
R017	Ring 8	not used	0.000E+00	---	FRACA( 8)
R017	Ring 9	not used	0.000E+00	---	FRACA( 9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	not used	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	not used	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	not used	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	not used	-1	---	FPLANT
R018	Contamination fraction of meat	not used	-1	---	FMEAT
R018	Contamination fraction of milk	not used	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	not used	5.000E-01	---	LSI
R019	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	---	MLFD

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	not used	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	not used	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	not used	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	not used	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	not used	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	not used	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	not used	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	not used	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	not used	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
C14	DCF correction factor for gaseous forms of C14	not used	0.000E+00	---	CO2F
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA (1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA (2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	257	---	---	KYMAX

Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	active
2 -- inhalation (w/o radon)	active
3 -- plant ingestion	suppressed
4 -- meat ingestion	suppressed
5 -- milk ingestion	suppressed
6 -- aquatic foods	suppressed
7 -- drinking water	suppressed
8 -- soil ingestion	active
9 -- radon	suppressed
Find peak pathway doses	suppressed

Contaminated Zone Dimensions

Initial Soil Concentrations, pCi/g

Area:	10000.00 square meters	Cs-137	1.130E-01
Thickness:	2.00 meters	Ra-226	1.000E+00
Cover Depth:	0.61 meters	Sr-90	3.310E-01

Total Dose TDOSE(t), mrem/yr

Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	9.116E-03	9.089E-03	9.036E-03	8.854E-03	8.356E-03	6.847E-03	3.903E-03	5.471E-04
M(t):	3.646E-04	3.636E-04	3.615E-04	3.541E-04	3.342E-04	2.739E-04	1.561E-04	2.188E-05

Maximum TDOSE(t): 9.116E-03 mrem/yr at t = 0.000E+00 years

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	5.723E-05	0.0063	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
Ra-226	9.059E-03	0.9937	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
Sr-90	1.398E-07	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
===== Total	9.116E-03	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	5.723E-05	0.0063										
Ra-226	0.000E+00	0.0000	9.059E-03	0.9937										
Sr-90	0.000E+00	0.0000	1.398E-07	0.0000										
===== Total	0.000E+00	0.0000	9.116E-03	1.0000										

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	5.592E-05	0.0062	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
Ra-226	9.033E-03	0.9938	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
Sr-90	1.358E-07	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
===== Total	9.089E-03	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	5.592E-05	0.0062										
Ra-226	0.000E+00	0.0000	9.033E-03	0.9938										
Sr-90	0.000E+00	0.0000	1.358E-07	0.0000										
===== Total	0.000E+00	0.0000	9.089E-03	1.0000										

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	5.339E-05	0.0059	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
Ra-226	8.983E-03	0.9941	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
Sr-90	1.281E-07	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
===== Total	9.036E-03	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	5.339E-05	0.0059										
Ra-226	0.000E+00	0.0000	8.983E-03	0.9941										
Sr-90	0.000E+00	0.0000	1.281E-07	0.0000										
===== Total	0.000E+00	0.0000	9.036E-03	1.0000										

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	4.541E-05	0.0051	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
Ra-226	8.808E-03	0.9949	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
Sr-90	1.043E-07	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
===== Total	8.854E-03	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	4.541E-05	0.0051										
Ra-226	0.000E+00	0.0000	8.808E-03	0.9949										
Sr-90	0.000E+00	0.0000	1.043E-07	0.0000										
===== Total	0.000E+00	0.0000	8.854E-03	1.0000										

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	2.858E-05	0.0034	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
Ra-226	8.327E-03	0.9966	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
Sr-90	5.802E-08	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
===== Total	8.356E-03	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	2.858E-05	0.0034										
Ra-226	0.000E+00	0.0000	8.327E-03	0.9966										
Sr-90	0.000E+00	0.0000	5.802E-08	0.0000										
===== Total	0.000E+00	0.0000	8.356E-03	1.0000										

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	5.657E-06	0.0008	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
Ra-226	6.842E-03	0.9992	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
Sr-90	7.452E-09	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
===== Total	6.847E-03	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	5.657E-06	0.0008										
Ra-226	0.000E+00	0.0000	6.842E-03	0.9992										
Sr-90	0.000E+00	0.0000	7.452E-09	0.0000										
===== Total	0.000E+00	0.0000	6.847E-03	1.0000										

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	5.528E-08	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
Ra-226	3.903E-03	1.0000	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
Sr-90	2.117E-11	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
===== Total	3.903E-03	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	5.528E-08	0.0000										
Ra-226	0.000E+00	0.0000	3.903E-03	1.0000										
Sr-90	0.000E+00	0.0000	2.117E-11	0.0000										
===== Total	0.000E+00	0.0000	3.903E-03	1.0000										

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	5.100E-15	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
Ra-226	5.471E-04	1.0000	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
Sr-90	2.584E-20	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
===== Total	5.471E-04	1.0000	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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	5.100E-15	0.0000										
Ra-226	0.000E+00	0.0000	5.471E-04	1.0000										
Sr-90	0.000E+00	0.0000	2.584E-20	0.0000										
===== Total	0.000E+00	0.0000	5.471E-04	1.0000										

\*Sum of all water independent and dependent pathways.

Dose/Source Ratios Summed Over All Pathways  
 Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137+D	Cs-137+D	1.000E+00	5.065E-04	4.949E-04	4.725E-04	4.018E-04	2.530E-04	5.007E-05	4.892E-07	4.513E-14
Ra-226+D	Ra-226+D	1.000E+00	9.059E-03	9.033E-03	8.983E-03	8.808E-03	8.327E-03	6.842E-03	3.903E-03	5.471E-04
Ra-226+D	Pb-210+D	1.000E+00	4.314E-10	1.274E-09	2.871E-09	7.636E-09	1.603E-08	2.091E-08	1.254E-08	1.759E-09
Ra-226+D	§DSR(j)		9.059E-03	9.033E-03	8.983E-03	8.808E-03	8.327E-03	6.842E-03	3.903E-03	5.471E-04
Sr-90+D	Sr-90+D	1.000E+00	4.224E-07	4.102E-07	3.869E-07	3.151E-07	1.753E-07	2.251E-08	6.394E-11	7.808E-20

§ is used to indicate summation; the Greek sigma is not included in this font.  
 The DSR includes contributions from associated (half-life <= 180 days) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g  
 Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Nuclide (i)	t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137		4.936E+04	5.052E+04	5.291E+04	6.221E+04	9.883E+04	4.993E+05	5.110E+07	*8.704E+13
Ra-226		2.760E+03	2.767E+03	2.783E+03	2.838E+03	3.002E+03	3.654E+03	6.406E+03	4.570E+04
Sr-90		5.918E+07	6.094E+07	6.462E+07	7.934E+07	1.426E+08	1.110E+09	3.910E+11	*1.365E+14

\*At specific activity limit

Summed Dose/Source Ratios DSR(i,t) in (mrem/yr)/(pCi/g)  
 and Single Radionuclide Soil Guidelines G(i,t) in pCi/g  
 at tmin = time of minimum single radionuclide soil guideline  
 and at tmax = time of maximum total dose = 0.000E+00 years

Nuclide (i)	Initial (pCi/g)	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Cs-137	1.130E-01	0.000E+00	5.065E-04	4.936E+04	5.065E-04	4.936E+04
Ra-226	1.000E+00	0.000E+00	9.059E-03	2.760E+03	9.059E-03	2.760E+03
Sr-90	3.310E-01	0.000E+00	4.224E-07	5.918E+07	4.224E-07	5.918E+07

Individual Nuclide Dose Summed Over All Pathways  
 Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	DOSE(j,t), mrem/yr							
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137	Cs-137	1.000E+00	5.723E-05	5.592E-05	5.339E-05	4.541E-05	2.858E-05	5.657E-06	5.528E-08	5.100E-15
Ra-226	Ra-226	1.000E+00	9.059E-03	9.033E-03	8.983E-03	8.808E-03	8.327E-03	6.842E-03	3.903E-03	5.471E-04
Pb-210	Ra-226	1.000E+00	4.314E-10	1.274E-09	2.871E-09	7.636E-09	1.603E-08	2.091E-08	1.254E-08	1.759E-09
Sr-90	Sr-90	1.000E+00	1.398E-07	1.358E-07	1.281E-07	1.043E-07	5.802E-08	7.452E-09	2.117E-11	2.584E-20
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

THF(i) is the thread fraction of the parent nuclide.  
 § is used to indicate summation; the Greek sigma is not included in this font.

Individual Nuclide Soil Concentration  
 Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g							
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137	Cs-137	1.000E+00	1.130E-01	1.104E-01	1.054E-01	8.966E-02	5.644E-02	1.117E-02	1.092E-04	1.007E-11
Ra-226	Ra-226	1.000E+00	1.000E+00	9.972E-01	9.916E-01	9.723E-01	9.192E-01	7.553E-01	4.308E-01	6.039E-02
Pb-210	Ra-226	1.000E+00	0.000E+00	3.054E-02	8.844E-02	2.612E-01	5.656E-01	7.448E-01	4.472E-01	6.270E-02
Sr-90	Sr-90	1.000E+00	3.310E-01	3.214E-01	3.031E-01	2.469E-01	1.374E-01	1.764E-02	5.010E-05	6.118E-14
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

THF(i) is the thread fraction of the parent nuclide.  
 § is used to indicate summation; the Greek sigma is not included in this font.

RESCALC.EXE execution time = 1.71 seconds

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Cancer Risk Slope Factors Summary Table  
 Risk Library: FGR 13 Morbidity

Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-1	Ground external radiation slope factors, 1/yr per (pCi/g):			
Sf-1	Cs-137+D	2.55E-06	5.32E-10	SLPF( 1,1)
Sf-1	Pb-210+D	4.21E-09	1.41E-09	SLPF( 2,1)
Sf-1	Ra-226+D	8.49E-06	2.29E-08	SLPF( 3,1)
Sf-1	Sr-90+D	1.96E-08	4.82E-10	SLPF( 4,1)
Sf-2	Inhalation, slope factors, 1/(pCi):			
Sf-2	Cs-137+D	1.12E-10	1.12E-10	SLPF( 1,2)
Sf-2	Pb-210+D	3.08E-08	1.58E-08	SLPF( 2,2)
Sf-2	Ra-226+D	2.83E-08	2.82E-08	SLPF( 3,2)
Sf-2	Sr-90+D	4.33E-10	4.25E-10	SLPF( 4,2)
Sf-3	Food ingestion, slope factors, 1/(pCi):			
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF( 1,3)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF( 2,3)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF( 3,3)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF( 4,3)
Sf-3	Water ingestion, slope factors, 1/(pCi):			
Sf-3	Cs-137+D	3.04E-11	3.04E-11	SLPF( 1,4)
Sf-3	Pb-210+D	2.66E-09	8.81E-10	SLPF( 2,4)
Sf-3	Ra-226+D	3.86E-10	3.85E-10	SLPF( 3,4)
Sf-3	Sr-90+D	7.40E-11	5.59E-11	SLPF( 4,4)
Sf-3	Soil ingestion, slope factors, 1/(pCi):			
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF( 1,5)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF( 2,5)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF( 3,5)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF( 4,5)
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	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)

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

Risk Slope and Environmental Transport Factors for the Ground Pathway

Nuclide (i)	Slope(i)* t=	ETFG(i,t) At Time in Years (dimensionless)							
		0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
At-218	3.570E-09	1.443E-15	1.443E-15	1.443E-15	1.443E-15	1.443E-15	1.443E-15	1.443E-15	1.443E-15
Ba-137m	2.690E-06	1.502E-04	1.502E-04	1.502E-04	1.502E-04	1.502E-04	1.502E-04	1.502E-04	1.502E-04
Bi-210	2.760E-09	4.352E-06	4.352E-06	4.352E-06	4.352E-06	4.352E-06	4.352E-06	4.352E-06	4.352E-06
Bi-214	7.480E-06	9.202E-04	9.202E-04	9.202E-04	9.202E-04	9.202E-04	9.202E-04	9.202E-04	9.202E-04
Cs-137	5.320E-10	4.736E-07	4.736E-07	4.736E-07	4.736E-07	4.736E-07	4.736E-07	4.736E-07	4.736E-07
Pb-210	1.410E-09	2.038E-20	2.038E-20	2.038E-20	2.038E-20	2.038E-20	2.038E-20	2.038E-20	2.038E-20
Pb-214	9.820E-07	3.450E-05	3.450E-05	3.450E-05	3.450E-05	3.450E-05	3.450E-05	3.450E-05	3.450E-05
Po-210	3.950E-11	2.370E-04	2.370E-04	2.370E-04	2.370E-04	2.370E-04	2.370E-04	2.370E-04	2.370E-04
Po-214	3.860E-10	2.812E-04	2.812E-04	2.812E-04	2.812E-04	2.812E-04	2.812E-04	2.812E-04	2.812E-04
Po-218	4.260E-11	2.818E-04	2.818E-04	2.818E-04	2.818E-04	2.818E-04	2.818E-04	2.818E-04	2.818E-04
Ra-226	2.290E-08	3.892E-06	3.892E-06	3.892E-06	3.892E-06	3.892E-06	3.892E-06	3.892E-06	3.892E-06
Rn-222	1.740E-09	1.134E-04	1.134E-04	1.134E-04	1.134E-04	1.134E-04	1.134E-04	1.134E-04	1.134E-04
Sr-90	4.820E-10	1.443E-07	1.443E-07	1.443E-07	1.443E-07	1.443E-07	1.443E-07	1.443E-07	1.443E-07
Tl-210	0.000E+00	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01
Y-90	1.910E-08	1.792E-05	1.792E-05	1.792E-05	1.792E-05	1.792E-05	1.792E-05	1.792E-05	1.792E-05
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

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

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		
Cs-137	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	0.000E+00
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	0.000E+00
Ra-226	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	0.000E+00
Sr-90	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	0.000E+00

\* 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

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= 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.
Cs-137	7.955E-10	0.0049	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
Pb-210	1.462E-13	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
Ra-226	1.606E-07	0.9951	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
Sr-90	1.953E-12	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
Total	1.614E-07	1.0000	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



Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	7.955E-10	0.0049										
Ra-226	0.000E+00	0.0000	1.606E-07	0.9951										
Sr-90	0.000E+00	0.0000	1.953E-12	0.0000										
===== Total	0.000E+00	0.0000	1.614E-07	1.0000										

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

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		
Cs-137	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	0.000E+00
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	0.000E+00
Ra-226	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	0.000E+00
Sr-90	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	0.000E+00
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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= 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

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.
Cs-137	7.773E-10	0.0048	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
Pb-210	1.566E-13	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
Ra-226	1.601E-07	0.9952	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
Sr-90	1.897E-12	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
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	1.609E-07	1.0000	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



Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	7.773E-10	0.0048										
Ra-226	0.000E+00	0.0000	1.601E-07	0.9952										
Sr-90	0.000E+00	0.0000	1.897E-12	0.0000										
===== Total	0.000E+00	0.0000	1.609E-07	1.0000										

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

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		
Cs-137	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	0.000E+00
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	0.000E+00
Ra-226	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	0.000E+00
Sr-90	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	0.000E+00

\* 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

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 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.
Cs-137	7.421E-10	0.0046	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
Pb-210	1.764E-13	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
Ra-226	1.592E-07	0.9953	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
Sr-90	1.789E-12	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
Total	1.600E-07	1.0000	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



Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	7.421E-10	0.0046										
Ra-226	0.000E+00	0.0000	1.592E-07	0.9953										
Sr-90	0.000E+00	0.0000	1.789E-12	0.0000										
===== Total	0.000E+00	0.0000	1.600E-07	1.0000										

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

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		
Cs-137	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	0.000E+00
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	0.000E+00
Ra-226	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	0.000E+00
Sr-90	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	0.000E+00

\* 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= 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

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.
Cs-137	6.312E-10	0.0040	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
Pb-210	2.349E-13	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
Ra-226	1.561E-07	0.9960	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
Sr-90	1.457E-12	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
Total	1.567E-07	1.0000	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



Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	6.312E-10	0.0040										
Ra-226	0.000E+00	0.0000	1.561E-07	0.9960										
Sr-90	0.000E+00	0.0000	1.457E-12	0.0000										
===== Total	0.000E+00	0.0000	1.567E-07	1.0000										

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

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As pCi/yr at t= 3.000E+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		
Cs-137	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	0.000E+00
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	0.000E+00
Ra-226	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	0.000E+00
Sr-90	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	0.000E+00

\* 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+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

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p) and Fraction of Total Risk at t= 3.000E+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.
Cs-137	3.973E-10	0.0027	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
Pb-210	3.353E-13	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
Ra-226	1.476E-07	0.9973	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
Sr-90	8.104E-13	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
Total	1.480E-07	1.0000	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



Total Excess Cancer Risk CNRSI(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
 and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.										
Cs-137	0.000E+00	0.0000	3.973E-10	0.0027										
Ra-226	0.000E+00	0.0000	1.476E-07	0.9973										
Sr-90	0.000E+00	0.0000	8.104E-13	0.0000										
===== Total	0.000E+00	0.0000	1.480E-07	1.0000										

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

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		
Cs-137	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	0.000E+00
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	0.000E+00
Ra-226	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	0.000E+00
Sr-90	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	0.000E+00

\* 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= 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

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 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.
Cs-137	7.864E-11	0.0006	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
Pb-210	3.750E-13	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
Ra-226	1.213E-07	0.9993	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
Sr-90	1.041E-13	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
Total	1.213E-07	1.0000	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



Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	7.864E-11	0.0006										
Ra-226	0.000E+00	0.0000	1.213E-07	0.9994										
Sr-90	0.000E+00	0.0000	1.041E-13	0.0000										
===== Total	0.000E+00	0.0000	1.213E-07	1.0000										

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

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		
Cs-137	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	0.000E+00
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	0.000E+00
Ra-226	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	0.000E+00
Sr-90	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	0.000E+00

\* 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+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

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.
Cs-137	7.685E-13	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
Pb-210	2.219E-13	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
Ra-226	6.917E-08	1.0000	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
Sr-90	2.956E-16	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
Total	6.917E-08	1.0000	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



Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	7.685E-13	0.0000										
Ra-226	0.000E+00	0.0000	6.917E-08	1.0000										
Sr-90	0.000E+00	0.0000	2.956E-16	0.0000										
===== Total	0.000E+00	0.0000	6.917E-08	1.0000										

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

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		
Cs-137	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	0.000E+00
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	0.000E+00
Ra-226	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	0.000E+00
Sr-90	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	0.000E+00

\* 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= 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.
Cs-137	7.089E-20	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
Pb-210	3.110E-14	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
Ra-226	9.696E-09	1.0000	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
Sr-90	3.610E-25	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
Total	9.696E-09	1.0000	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



Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	7.089E-20	0.0000										
Ra-226	0.000E+00	0.0000	9.696E-09	1.0000										
Sr-90	0.000E+00	0.0000	3.610E-25	0.0000										
===== Total	0.000E+00	0.0000	9.696E-09	1.0000										

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

Summary : Parcel C Baseline 2032 m2

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Dose Conversion Factor (and Related) Parameter Summary

File: FGR 13 MORBIDITY

Menu	Parameter	Current Value	Base Case*	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2( 1)
B-1	Pb-210+D	2.320E-02	1.360E-02	DCF2( 2)
B-1	Ra-226+D	8.594E-03	8.580E-03	DCF2( 3)
B-1	Sr-90+D	1.308E-03	1.300E-03	DCF2( 4)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3( 1)
D-1	Pb-210+D	7.276E-03	5.370E-03	DCF3( 2)
D-1	Ra-226+D	1.321E-03	1.320E-03	DCF3( 3)
D-1	Sr-90+D	1.528E-04	1.420E-04	DCF3( 4)
D-34	Food transfer factors:			
D-34	Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF( 1,1)
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF( 1,2)
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF( 1,3)
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF( 2,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF( 2,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF( 2,3)
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF( 3,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF( 3,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF( 3,3)
D-34	Sr-90+D , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF( 4,1)
D-34	Sr-90+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-03	8.000E-03	RTF( 4,2)
D-34	Sr-90+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF( 4,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC( 1,1)
D-5	Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC( 1,2)
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC( 2,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC( 2,2)
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC( 3,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC( 3,2)
D-5	Sr-90+D , fish	6.000E+01	6.000E+01	BIOFAC( 4,1)
D-5	Sr-90+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC( 4,2)

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

Summary : Parcel C Baseline 2032 m2

File : Parcel C Total Baseline 2032 m2.rad

## Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	2.032E+03	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	2.000E+00	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	not used	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T( 2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T( 3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T( 4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T( 5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T( 6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T( 7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T( 8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T( 9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Cs-137	1.130E-01	0.000E+00	---	SI( 1)
R012	Initial principal radionuclide (pCi/g): Ra-226	1.000E+00	0.000E+00	---	SI( 3)
R012	Initial principal radionuclide (pCi/g): Sr-90	3.310E-01	0.000E+00	---	SI( 4)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	WI( 1)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	WI( 3)
R012	Concentration in groundwater (pCi/L): Sr-90	not used	0.000E+00	---	WI( 4)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	2.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.000E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	not used	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	not used	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	not used	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	not used	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	not used	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	not used	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	not used	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	not used	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	not used	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	not used	1.000E+01	---	DWIBWT

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	not used	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	not used	2.500E+02	---	UW
R015	Number of unsaturated zone strata	not used	1	---	NS
R015	Unsat. zone 1, thickness (m)	not used	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	not used	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	not used	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	not used	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	not used	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	not used	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	not used	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	4.600E+03	4.600E+03	---	DCNUCC( 1)
R016	Unsat. zone 1 (cm**3/g)	not used	4.600E+03	---	DCNUCU( 1,1)
R016	Saturated zone (cm**3/g)	not used	4.600E+03	---	DCNUCS( 1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.623E-05	ALEACH( 1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 1)
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC( 3)
R016	Unsat. zone 1 (cm**3/g)	not used	7.000E+01	---	DCNUCU( 3,1)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS( 3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.374E-03	ALEACH( 3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 3)
R016	Distribution coefficients for Sr-90				
R016	Contaminated zone (cm**3/g)	3.000E+01	3.000E+01	---	DCNUCC( 4)
R016	Unsat. zone 1 (cm**3/g)	not used	3.000E+01	---	DCNUCU( 4,1)
R016	Saturated zone (cm**3/g)	not used	3.000E+01	---	DCNUCS( 4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.516E-03	ALEACH( 4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 4)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC( 2)
R016	Unsat. zone 1 (cm**3/g)	not used	1.000E+02	---	DCNUCU( 2,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS( 2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.663E-03	ALEACH( 2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 2)
R017	Inhalation rate (m**3/yr)	7.270E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	2.400E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	9.590E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE( 1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE( 2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE( 3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE( 4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE( 5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE( 6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE( 7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE( 8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE( 9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA( 1)
R017	Ring 2	not used	2.732E-01	---	FRACA( 2)
R017	Ring 3	not used	0.000E+00	---	FRACA( 3)
R017	Ring 4	not used	0.000E+00	---	FRACA( 4)
R017	Ring 5	not used	0.000E+00	---	FRACA( 5)
R017	Ring 6	not used	0.000E+00	---	FRACA( 6)
R017	Ring 7	not used	0.000E+00	---	FRACA( 7)
R017	Ring 8	not used	0.000E+00	---	FRACA( 8)
R017	Ring 9	not used	0.000E+00	---	FRACA( 9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	not used	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	not used	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	not used	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	not used	-1	---	FPLANT
R018	Contamination fraction of meat	not used	-1	---	FMEAT
R018	Contamination fraction of milk	not used	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	not used	5.000E-01	---	LSI

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## Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R019	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	not used	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	not used	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	not used	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	not used	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	not used	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	not used	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	not used	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	not used	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	not used	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
C14	DCF correction factor for gaseous forms of C14	not used	0.000E+00	---	CO2F
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV

Summary : Parcel C Baseline 2032 m2

File : Parcel C Total Baseline 2032 m2.rad

## Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	257	---	---	KYMAX

## Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	active
2 -- inhalation (w/o radon)	active
3 -- plant ingestion	suppressed
4 -- meat ingestion	suppressed
5 -- milk ingestion	suppressed
6 -- aquatic foods	suppressed
7 -- drinking water	suppressed
8 -- soil ingestion	active
9 -- radon	suppressed
Find peak pathway doses	suppressed

Summary : Parcel C Baseline 2032 m2

File : Parcel C Total Baseline 2032 m2.rad

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	2032.00 square meters	Cs-137	1.130E-01
Thickness:	2.00 meters	Ra-226	1.000E+00
Cover Depth:	0.00 meters	Sr-90	3.310E-01

Total Dose TDOSE(t), mrem/yr

Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	1.010E+01	1.008E+01	1.002E+01	9.830E+00	9.291E+00	7.601E+00	4.323E+00	6.059E-01
M(t):	4.041E-01	4.030E-01	4.008E-01	3.932E-01	3.716E-01	3.040E-01	1.729E-01	2.424E-02

Maximum TDOSE(t): 1.010E+01 mrem/yr at t = 0.000E+00 years

Summary : Parcel C Baseline 2032 m2

File : Parcel C Total Baseline 2032 m2.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	3.284E-01	0.0325	3.567E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.955E-04	0.0000
Ra-226	9.715E+00	0.9616	8.949E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.008E-02	0.0050
Sr-90	6.968E-03	0.0007	4.273E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.745E-03	0.0002
===== Total	1.005E+01	0.9948	9.380E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.202E-02	0.0051

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	3.286E-01	0.0325										
Ra-226	0.000E+00	0.0000	9.766E+00	0.9666										
Sr-90	0.000E+00	0.0000	8.755E-03	0.0009										
===== Total	0.000E+00	0.0000	1.010E+01	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 2032 m2

File : Parcel C Total Baseline 2032 m2.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	3.209E-01	0.0318	3.486E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.910E-04	0.0000
Ra-226	9.687E+00	0.9615	9.621E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.759E-02	0.0057
Sr-90	6.766E-03	0.0007	4.149E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.694E-03	0.0002
===== Total	1.002E+01	0.9940	1.004E-03	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.948E-02	0.0059

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	3.211E-01	0.0319										
Ra-226	0.000E+00	0.0000	9.746E+00	0.9673										
Sr-90	0.000E+00	0.0000	8.502E-03	0.0008										
===== Total	0.000E+00	0.0000	1.008E+01	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 2032 m2

File : Parcel C Total Baseline 2032 m2.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	3.064E-01	0.0306	3.328E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.824E-04	0.0000
Ra-226	9.634E+00	0.9613	1.089E-03	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.182E-02	0.0072
Sr-90	6.381E-03	0.0006	3.913E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.598E-03	0.0002
===== Total	9.946E+00	0.9925	1.129E-03	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.360E-02	0.0073

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	3.066E-01	0.0306										
Ra-226	0.000E+00	0.0000	9.706E+00	0.9686										
Sr-90	0.000E+00	0.0000	8.018E-03	0.0008										
===== Total	0.000E+00	0.0000	1.002E+01	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 2032 m2

File : Parcel C Total Baseline 2032 m2.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	2.606E-01	0.0265	2.830E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.551E-04	0.0000
Ra-226	9.447E+00	0.9611	1.467E-03	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.141E-01	0.0116
Sr-90	5.197E-03	0.0005	3.187E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.301E-03	0.0001
===== Total	9.713E+00	0.9881	1.499E-03	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.156E-01	0.0118

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	2.607E-01	0.0265										
Ra-226	0.000E+00	0.0000	9.563E+00	0.9728										
Sr-90	0.000E+00	0.0000	6.530E-03	0.0007										
===== Total	0.000E+00	0.0000	9.830E+00	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 2032 m2

File : Parcel C Total Baseline 2032 m2.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	1.640E-01	0.0177	1.782E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.764E-05	0.0000
Ra-226	8.933E+00	0.9615	2.115E-03	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.878E-01	0.0202
Sr-90	2.891E-03	0.0003	1.773E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.240E-04	0.0001
===== Total	9.100E+00	0.9795	2.133E-03	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.886E-01	0.0203

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	1.641E-01	0.0177										
Ra-226	0.000E+00	0.0000	9.123E+00	0.9819										
Sr-90	0.000E+00	0.0000	3.633E-03	0.0004										
===== Total	0.000E+00	0.0000	9.291E+00	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 2032 m2

File : Parcel C Total Baseline 2032 m2.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	3.247E-02	0.0043	3.527E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.933E-05	0.0000
Ra-226	7.341E+00	0.9658	2.378E-03	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.245E-01	0.0295
Sr-90	3.713E-04	0.0000	2.277E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.298E-05	0.0000
===== Total	7.374E+00	0.9701	2.380E-03	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.246E-01	0.0295

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	3.248E-02	0.0043										
Ra-226	0.000E+00	0.0000	7.568E+00	0.9957										
Sr-90	0.000E+00	0.0000	4.666E-04	0.0001										
===== Total	0.000E+00	0.0000	7.601E+00	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 2032 m2

File : Parcel C Total Baseline 2032 m2.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	3.173E-04	0.0001	3.446E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.889E-07	0.0000
Ra-226	4.188E+00	0.9687	1.407E-03	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.336E-01	0.0309
Sr-90	1.055E-06	0.0000	6.468E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.641E-07	0.0000
===== Total	4.188E+00	0.9688	1.407E-03	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.336E-01	0.0309

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	3.174E-04	0.0001										
Ra-226	0.000E+00	0.0000	4.323E+00	0.9999										
Sr-90	0.000E+00	0.0000	1.325E-06	0.0000										
===== Total	0.000E+00	0.0000	4.323E+00	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 2032 m2

File : Parcel C Total Baseline 2032 m2.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	2.927E-11	0.0000	3.179E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.742E-14	0.0000
Ra-226	5.870E-01	0.9688	1.973E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.874E-02	0.0309
Sr-90	1.288E-15	0.0000	7.898E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.225E-16	0.0000
===== Total	5.870E-01	0.9688	1.973E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.874E-02	0.0309

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	2.928E-11	0.0000										
Ra-226	0.000E+00	0.0000	6.059E-01	1.0000										
Sr-90	0.000E+00	0.0000	1.618E-15	0.0000										
===== Total	0.000E+00	0.0000	6.059E-01	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 2032 m2

File : Parcel C Total Baseline 2032 m2.rad

Dose/Source Ratios Summed Over All Pathways  
 Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137+D	Cs-137+D	1.000E+00	2.908E+00	2.842E+00	2.713E+00	2.307E+00	1.452E+00	2.875E-01	2.809E-03	2.591E-10
Ra-226+D	Ra-226+D	1.000E+00	9.762E+00	9.734E+00	9.680E+00	9.491E+00	8.973E+00	7.372E+00	4.205E+00	5.895E-01
Ra-226+D	Pb-210+D	1.000E+00	4.031E-03	1.190E-02	2.683E-02	7.135E-02	1.497E-01	1.953E-01	1.172E-01	1.643E-02
Ra-226+D	§DSR(j)		9.766E+00	9.746E+00	9.706E+00	9.563E+00	9.123E+00	7.568E+00	4.323E+00	6.059E-01
Sr-90+D	Sr-90+D	1.000E+00	2.645E-02	2.569E-02	2.422E-02	1.973E-02	1.098E-02	1.410E-03	4.004E-06	4.889E-15

§ is used to indicate summation; the Greek sigma is not included in this font.  
 The DSR includes contributions from associated (half-life <= 180 days) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g  
 Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Nuclide (i)	t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137	8.597E+00	8.798E+00	9.215E+00	1.084E+01	1.721E+01	8.696E+01	8.899E+03	9.647E+10	
Ra-226	2.560E+00	2.565E+00	2.576E+00	2.614E+00	2.740E+00	3.303E+00	5.784E+00	4.126E+01	
Sr-90	9.452E+02	9.733E+02	1.032E+03	1.267E+03	2.278E+03	1.773E+04	6.244E+06	*1.365E+14	

\*At specific activity limit

Summed Dose/Source Ratios DSR(i,t) in (mrem/yr)/(pCi/g)  
 and Single Radionuclide Soil Guidelines G(i,t) in pCi/g  
 at tmin = time of minimum single radionuclide soil guideline  
 and at tmax = time of maximum total dose = 0.000E+00 years

Nuclide (i)	Initial (pCi/g)	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Cs-137	1.130E-01	0.000E+00	2.908E+00	8.597E+00	2.908E+00	8.597E+00
Ra-226	1.000E+00	0.000E+00	9.766E+00	2.560E+00	9.766E+00	2.560E+00
Sr-90	3.310E-01	0.000E+00	2.645E-02	9.452E+02	2.645E-02	9.452E+02

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Individual Nuclide Dose Summed Over All Pathways  
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	DOSE(j,t), mrem/yr								
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	
Cs-137	Cs-137	1.000E+00	3.286E-01	3.211E-01	3.066E-01	2.607E-01	1.641E-01	3.248E-02	3.174E-04	2.928E-11	
Ra-226	Ra-226	1.000E+00	9.762E+00	9.734E+00	9.680E+00	9.491E+00	8.973E+00	7.372E+00	4.205E+00	5.895E-01	
Pb-210	Ra-226	1.000E+00	4.031E-03	1.190E-02	2.683E-02	7.135E-02	1.497E-01	1.953E-01	1.172E-01	1.643E-02	
Sr-90	Sr-90	1.000E+00	8.755E-03	8.502E-03	8.018E-03	6.530E-03	3.633E-03	4.666E-04	1.325E-06	1.618E-15	
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	

THF(i) is the thread fraction of the parent nuclide.

\$ is used to indicate summation; the Greek sigma is not included in this font.

Individual Nuclide Soil Concentration  
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g								
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	
Cs-137	Cs-137	1.000E+00	1.130E-01	1.104E-01	1.054E-01	8.966E-02	5.644E-02	1.117E-02	1.092E-04	1.007E-11	
Ra-226	Ra-226	1.000E+00	1.000E+00	9.972E-01	9.916E-01	9.723E-01	9.192E-01	7.553E-01	4.308E-01	6.039E-02	
Pb-210	Ra-226	1.000E+00	0.000E+00	3.054E-02	8.844E-02	2.612E-01	5.656E-01	7.448E-01	4.472E-01	6.270E-02	
Sr-90	Sr-90	1.000E+00	3.310E-01	3.214E-01	3.031E-01	2.469E-01	1.374E-01	1.764E-02	5.010E-05	6.118E-14	
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	

THF(i) is the thread fraction of the parent nuclide.

\$ is used to indicate summation; the Greek sigma is not included in this font.

RESRAD.EXE execution time = 5.25 seconds

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Cancer Risk Slope Factors Summary Table

Risk Library: FGR 13 Morbidity

Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-1	Ground external radiation slope factors, 1/yr per (pCi/g):			
Sf-1	Cs-137+D	2.55E-06	5.32E-10	SLPF( 1,1)
Sf-1	Pb-210+D	4.21E-09	1.41E-09	SLPF( 2,1)
Sf-1	Ra-226+D	8.49E-06	2.29E-08	SLPF( 3,1)
Sf-1	Sr-90+D	1.96E-08	4.82E-10	SLPF( 4,1)
Sf-2	Inhalation, slope factors, 1/(pCi):			
Sf-2	Cs-137+D	1.12E-10	1.12E-10	SLPF( 1,2)
Sf-2	Pb-210+D	3.08E-08	1.58E-08	SLPF( 2,2)
Sf-2	Ra-226+D	2.83E-08	2.82E-08	SLPF( 3,2)
Sf-2	Sr-90+D	4.33E-10	4.25E-10	SLPF( 4,2)
Sf-3	Food ingestion, slope factors, 1/(pCi):			
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF( 1,3)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF( 2,3)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF( 3,3)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF( 4,3)
Sf-3	Water ingestion, slope factors, 1/(pCi):			
Sf-3	Cs-137+D	3.04E-11	3.04E-11	SLPF( 1,4)
Sf-3	Pb-210+D	2.66E-09	8.81E-10	SLPF( 2,4)
Sf-3	Ra-226+D	3.86E-10	3.85E-10	SLPF( 3,4)
Sf-3	Sr-90+D	7.40E-11	5.59E-11	SLPF( 4,4)
Sf-3	Soil ingestion, slope factors, 1/(pCi):			
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF( 1,5)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF( 2,5)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF( 3,5)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF( 4,5)
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	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)

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

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Risk Slope and Environmental Transport Factors for the Ground Pathway

Nuclide (i)	Slope(i)* t=	ETFG(i,t) At Time in Years (dimensionless)							
		0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
At-218	3.570E-09	8.937E-01	8.937E-01	8.937E-01	8.937E-01	8.937E-01	8.937E-01	8.937E-01	8.937E-01
Ba-137m	2.690E-06	8.619E-01	8.619E-01	8.619E-01	8.619E-01	8.619E-01	8.619E-01	8.619E-01	8.619E-01
Bi-210	2.760E-09	8.743E-01	8.743E-01	8.743E-01	8.743E-01	8.743E-01	8.743E-01	8.743E-01	8.743E-01
Bi-214	7.480E-06	8.694E-01	8.694E-01	8.694E-01	8.694E-01	8.694E-01	8.694E-01	8.694E-01	8.694E-01
Cs-137	5.320E-10	8.829E-01	8.829E-01	8.829E-01	8.829E-01	8.829E-01	8.829E-01	8.829E-01	8.829E-01
Pb-210	1.410E-09	9.016E-01	9.016E-01	9.016E-01	9.016E-01	9.016E-01	9.016E-01	9.016E-01	9.016E-01
Pb-214	9.820E-07	8.736E-01	8.736E-01	8.736E-01	8.736E-01	8.736E-01	8.736E-01	8.736E-01	8.736E-01
Po-210	3.950E-11	8.673E-01	8.673E-01	8.673E-01	8.673E-01	8.673E-01	8.673E-01	8.673E-01	8.673E-01
Po-214	3.860E-10	8.619E-01	8.619E-01	8.619E-01	8.619E-01	8.619E-01	8.619E-01	8.619E-01	8.619E-01
Po-218	4.260E-11	8.673E-01	8.673E-01	8.673E-01	8.673E-01	8.673E-01	8.673E-01	8.673E-01	8.673E-01
Ra-226	2.290E-08	8.860E-01	8.860E-01	8.860E-01	8.860E-01	8.860E-01	8.860E-01	8.860E-01	8.860E-01
Rn-222	1.740E-09	8.629E-01	8.629E-01	8.629E-01	8.629E-01	8.629E-01	8.629E-01	8.629E-01	8.629E-01
Sr-90	4.820E-10	8.857E-01	8.857E-01	8.857E-01	8.857E-01	8.857E-01	8.857E-01	8.857E-01	8.857E-01
Tl-210	0.000E+00	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01
Y-90	1.910E-08	8.673E-01	8.673E-01	8.673E-01	8.673E-01	8.673E-01	8.673E-01	8.673E-01	8.673E-01
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* - Units are 1/yr per (pCi/g) at infinite depth and area. Multiplication by ETEG(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	
Cs-137	1.131E-02	0.000E+00	0.000E+00	0.000E+00	3.955E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.955E+00
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	1.001E-01	0.000E+00	0.000E+00	0.000E+00	3.500E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.500E+01
Sr-90	3.314E-02	0.000E+00	0.000E+00	0.000E+00	1.159E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.159E+01

\* 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

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= 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.
Cs-137	4.565E-06	0.0257	2.333E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.724E-09	0.0000
Pb-210	2.543E-08	0.0001	2.106E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.243E-07	0.0046
Ra-226	1.714E-04	0.9660	6.569E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.182E-07	0.0024
Sr-90	9.692E-08	0.0005	2.475E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.903E-08	0.0001
Total	1.760E-04	0.9924	8.702E-08	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.264E-06	0.0071

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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 Dependent Pathways

Radio- Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Cs-137	0.000E+00	0.0000	4.568E-06	0.0257								
Pb-210	0.000E+00	0.0000	8.707E-07	0.0049								
Ra-226	0.000E+00	0.0000	1.718E-04	0.9687								
Sr-90	0.000E+00	0.0000	1.162E-07	0.0007								
===== Total	0.000E+00	0.0000	1.774E-04	1.0000								

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

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 CNRSI(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.
Cs-137	4.565E-06	0.0257	2.333E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.724E-09	0.0000
Ra-226	1.714E-04	0.9661	8.675E-08	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.242E-06	0.0070
Sr-90	9.692E-08	0.0005	2.475E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.903E-08	0.0001
===== Total	1.760E-04	0.9924	8.702E-08	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.264E-06	0.0071

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Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	4.568E-06	0.0257										
Ra-226	0.000E+00	0.0000	1.727E-04	0.9736										
Sr-90	0.000E+00	0.0000	1.162E-07	0.0007										
===== Total	0.000E+00	0.0000	1.774E-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	
Cs-137	1.105E-02	0.000E+00	0.000E+00	0.000E+00	3.865E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.865E+00
Pb-210	3.057E-03	0.000E+00	0.000E+00	0.000E+00	1.069E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.069E+00
Ra-226	9.983E-02	0.000E+00	0.000E+00	0.000E+00	3.491E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.491E+01
Sr-90	3.218E-02	0.000E+00	0.000E+00	0.000E+00	1.125E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.125E+01
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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= 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

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.
Cs-137	4.461E-06	0.0252	2.280E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.662E-09	0.0000
Pb-210	2.725E-08	0.0002	2.256E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.831E-07	0.0050
Ra-226	1.709E-04	0.9661	6.551E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.170E-07	0.0024
Sr-90	9.412E-08	0.0005	2.403E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.848E-08	0.0001
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	1.755E-04	0.9920	8.833E-08	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.321E-06	0.0075

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File : Parcel C Total Baseline 2032 m2.rad

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.								
Cs-137	0.000E+00	0.0000	4.463E-06	0.0252								
Pb-210	0.000E+00	0.0000	9.329E-07	0.0053								
Ra-226	0.000E+00	0.0000	1.714E-04	0.9689								
Sr-90	0.000E+00	0.0000	1.128E-07	0.0006								
===== Total	0.000E+00	0.0000	1.769E-04	1.0000								

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

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

Total Excess Cancer Risk CNRSI(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.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Cs-137	4.461E-06	0.0252	2.280E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.662E-09	0.0000
Ra-226	1.709E-04	0.9663	8.807E-08	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.300E-06	0.0074
Sr-90	9.412E-08	0.0005	2.403E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.848E-08	0.0001
===== Total	1.755E-04	0.9920	8.833E-08	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.321E-06	0.0075

Intrisk : Parcel C Baseline 2032 m2

File : Parcel C Total Baseline 2032 m2.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	4.463E-06	0.0252										
Ra-226	0.000E+00	0.0000	1.723E-04	0.9741										
Sr-90	0.000E+00	0.0000	1.128E-07	0.0006										
===== Total	0.000E+00	0.0000	1.769E-04	1.0000										

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

Intrisk : Parcel C Baseline 2032 m2

File : Parcel C Total Baseline 2032 m2.rad

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	
Cs-137	1.055E-02	0.000E+00	0.000E+00	0.000E+00	3.690E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.690E+00
Pb-210	8.854E-03	0.000E+00	0.000E+00	0.000E+00	3.096E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.096E+00
Ra-226	9.928E-02	0.000E+00	0.000E+00	0.000E+00	3.471E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.471E+01
Sr-90	3.035E-02	0.000E+00	0.000E+00	0.000E+00	1.061E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.061E+01

\* 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

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 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.
Cs-137	4.259E-06	0.0242	2.177E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.541E-09	0.0000
Pb-210	3.069E-08	0.0002	2.541E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.945E-07	0.0057
Ra-226	1.699E-04	0.9665	6.514E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.147E-07	0.0024
Sr-90	8.876E-08	0.0005	2.266E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.742E-08	0.0001
Total	1.743E-04	0.9914	9.080E-08	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.429E-06	0.0081

Intrisk : Parcel C Baseline 2032 m2

File : Parcel C Total Baseline 2032 m2.rad

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.								
Cs-137	0.000E+00	0.0000	4.261E-06	0.0242								
Pb-210	0.000E+00	0.0000	1.051E-06	0.0060								
Ra-226	0.000E+00	0.0000	1.704E-04	0.9692								
Sr-90	0.000E+00	0.0000	1.064E-07	0.0006								
===== Total	0.000E+00	0.0000	1.758E-04	1.0000								

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

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 CNRSI(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.
Cs-137	4.259E-06	0.0242	2.177E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.541E-09	0.0000
Ra-226	1.699E-04	0.9666	9.055E-08	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.409E-06	0.0080
Sr-90	8.876E-08	0.0005	2.266E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.742E-08	0.0001
===== Total	1.743E-04	0.9914	9.080E-08	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.429E-06	0.0081

Intrisk : Parcel C Baseline 2032 m2

File : Parcel C Total Baseline 2032 m2.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	4.261E-06	0.0242										
Ra-226	0.000E+00	0.0000	1.714E-04	0.9752										
Sr-90	0.000E+00	0.0000	1.064E-07	0.0006										
===== Total	0.000E+00	0.0000	1.758E-04	1.0000										

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

Intrisk : Parcel C Baseline 2032 m2

File : Parcel C Total Baseline 2032 m2.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	
Cs-137	8.976E-03	0.000E+00	0.000E+00	0.000E+00	3.138E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.138E+00
Pb-210	2.615E-02	0.000E+00	0.000E+00	0.000E+00	9.142E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.142E+00
Ra-226	9.734E-02	0.000E+00	0.000E+00	0.000E+00	3.403E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.403E+01
Sr-90	2.472E-02	0.000E+00	0.000E+00	0.000E+00	8.642E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.642E+00

\* 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= 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

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.
Cs-137	3.622E-06	0.0210	1.851E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.161E-09	0.0000
Pb-210	4.087E-08	0.0002	3.384E-08	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.325E-06	0.0077
Ra-226	1.666E-04	0.9676	6.387E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.066E-07	0.0024
Sr-90	7.229E-08	0.0004	1.846E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.419E-08	0.0001
Total	1.703E-04	0.9893	9.792E-08	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.748E-06	0.0101

Intrisk : Parcel C Baseline 2032 m2

File : Parcel C Total Baseline 2032 m2.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

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Cs-137	0.000E+00	0.0000	3.624E-06	0.0210								
Pb-210	0.000E+00	0.0000	1.399E-06	0.0081								
Ra-226	0.000E+00	0.0000	1.671E-04	0.9703								
Sr-90	0.000E+00	0.0000	8.667E-08	0.0005								
===== Total	0.000E+00	0.0000	1.722E-04	1.0000								

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

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 CNRSI(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.
Cs-137	3.622E-06	0.0210	1.851E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.161E-09	0.0000
Ra-226	1.666E-04	0.9678	9.772E-08	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.731E-06	0.0101
Sr-90	7.229E-08	0.0004	1.846E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.419E-08	0.0001
===== Total	1.703E-04	0.9893	9.792E-08	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.748E-06	0.0101

Intrisk : Parcel C Baseline 2032 m2

File : Parcel C Total Baseline 2032 m2.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	3.624E-06	0.0210										
Ra-226	0.000E+00	0.0000	1.685E-04	0.9784										
Sr-90	0.000E+00	0.0000	8.667E-08	0.0005										
===== Total	0.000E+00	0.0000	1.722E-04	1.0000										

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

Intrisk : Parcel C Baseline 2032 m2

File : Parcel C Total Baseline 2032 m2.rad

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As pCi/yr at t= 3.000E+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	
Cs-137	5.650E-03	0.000E+00	0.000E+00	0.000E+00	1.976E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.976E+00
Pb-210	5.663E-02	0.000E+00	0.000E+00	0.000E+00	1.980E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.980E+01
Ra-226	9.203E-02	0.000E+00	0.000E+00	0.000E+00	3.218E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.218E+01
Sr-90	1.375E-02	0.000E+00	0.000E+00	0.000E+00	4.808E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.808E+00
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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+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

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p) and Fraction of Total Risk at t= 3.000E+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.
Cs-137	2.280E-06	0.0140	1.165E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.361E-09	0.0000
Pb-210	5.834E-08	0.0004	4.831E-08	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.891E-06	0.0117
Ra-226	1.575E-04	0.9706	6.039E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.844E-07	0.0024
Sr-90	4.022E-08	0.0002	1.027E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.895E-09	0.0000
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	1.599E-04	0.9853	1.088E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.284E-06	0.0141

Intrisk : Parcel C Baseline 2032 m2

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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+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Cs-137	0.000E+00	0.0000	2.281E-06	0.0141								
Pb-210	0.000E+00	0.0000	1.997E-06	0.0123								
Ra-226	0.000E+00	0.0000	1.580E-04	0.9733								
Sr-90	0.000E+00	0.0000	4.822E-08	0.0003								
===== Total	0.000E+00	0.0000	1.623E-04	1.0000								

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

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of  
Radon and its Decay Products at t= 3.000E+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 CNRSI(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 3.000E+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.
Cs-137	2.280E-06	0.0140	1.165E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.361E-09	0.0000
Ra-226	1.576E-04	0.9710	1.087E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.275E-06	0.0140
Sr-90	4.022E-08	0.0002	1.027E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.895E-09	0.0000
===== Total	1.599E-04	0.9853	1.088E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.284E-06	0.0141

Intrisk : Parcel C Baseline 2032 m2

File : Parcel C Total Baseline 2032 m2.rad

Total Excess Cancer Risk CNRSI(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.										
Cs-137	0.000E+00	0.0000	2.281E-06	0.0141										
Ra-226	0.000E+00	0.0000	1.600E-04	0.9856										
Sr-90	0.000E+00	0.0000	4.822E-08	0.0003										
===== Total	0.000E+00	0.0000	1.623E-04	1.0000										

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

Intrisk : Parcel C Baseline 2032 m2

File : Parcel C Total Baseline 2032 m2.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	
Cs-137	1.118E-03	0.000E+00	0.000E+00	0.000E+00	3.910E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.910E-01
Pb-210	7.457E-02	0.000E+00	0.000E+00	0.000E+00	2.607E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.607E+01
Ra-226	7.561E-02	0.000E+00	0.000E+00	0.000E+00	2.644E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.644E+01
Sr-90	1.766E-03	0.000E+00	0.000E+00	0.000E+00	6.175E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.175E-01
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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= 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

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.
Cs-137	4.513E-07	0.0034	2.307E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.693E-10	0.0000
Pb-210	6.525E-08	0.0005	5.402E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.115E-06	0.0160
Ra-226	1.294E-04	0.9769	4.961E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.158E-07	0.0024
Sr-90	5.165E-09	0.0000	1.319E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.014E-09	0.0000
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	1.299E-04	0.9809	1.037E-07	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.432E-06	0.0184

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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

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Cs-137	0.000E+00	0.0000	4.515E-07	0.0034								
Pb-210	0.000E+00	0.0000	2.234E-06	0.0169								
Ra-226	0.000E+00	0.0000	1.298E-04	0.9797								
Sr-90	0.000E+00	0.0000	6.192E-09	0.0000								
===== Total	0.000E+00	0.0000	1.325E-04	1.0000								

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

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 CNRSI(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 1.000E+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.
Cs-137	4.513E-07	0.0034	2.307E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.693E-10	0.0000
Ra-226	1.295E-04	0.9774	1.036E-07	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.430E-06	0.0183
Sr-90	5.165E-09	0.0000	1.319E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.014E-09	0.0000
===== Total	1.299E-04	0.9809	1.037E-07	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.432E-06	0.0184

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Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	4.515E-07	0.0034										
Ra-226	0.000E+00	0.0000	1.320E-04	0.9965										
Sr-90	0.000E+00	0.0000	6.192E-09	0.0000										
===== Total	0.000E+00	0.0000	1.325E-04	1.0000										

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

Intrisk : Parcel C Baseline 2032 m2

File : Parcel C Total Baseline 2032 m2.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	
Cs-137	1.093E-05	0.000E+00	0.000E+00	0.000E+00	3.821E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.821E-03
Pb-210	4.477E-02	0.000E+00	0.000E+00	0.000E+00	1.565E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.565E+01
Ra-226	4.313E-02	0.000E+00	0.000E+00	0.000E+00	1.508E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.508E+01
Sr-90	5.016E-06	0.000E+00	0.000E+00	0.000E+00	1.754E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.754E-03
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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+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

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.
Cs-137	4.410E-09	0.0001	2.254E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.632E-12	0.0000
Pb-210	3.860E-08	0.0005	3.196E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.251E-06	0.0166
Ra-226	7.382E-05	0.9796	2.830E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.802E-07	0.0024
Sr-90	1.467E-11	0.0000	3.746E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.880E-12	0.0000
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	7.386E-05	0.9802	6.026E-08	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.431E-06	0.0190

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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

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Cs-137	0.000E+00	0.0000	4.412E-09	0.0001								
Pb-210	0.000E+00	0.0000	1.322E-06	0.0175								
Ra-226	0.000E+00	0.0000	7.403E-05	0.9824								
Sr-90	0.000E+00	0.0000	1.759E-11	0.0000								
===== Total	0.000E+00	0.0000	7.536E-05	1.0000								

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

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 CNRSI(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 3.000E+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.
Cs-137	4.410E-09	0.0001	2.254E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.632E-12	0.0000
Ra-226	7.386E-05	0.9801	6.026E-08	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.431E-06	0.0190
Sr-90	1.467E-11	0.0000	3.746E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.880E-12	0.0000
===== Total	7.386E-05	0.9802	6.026E-08	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.431E-06	0.0190

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Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	4.412E-09	0.0001										
Ra-226	0.000E+00	0.0000	7.535E-05	0.9999										
Sr-90	0.000E+00	0.0000	1.759E-11	0.0000										
===== Total	0.000E+00	0.0000	7.536E-05	1.0000										

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

Intrisk : Parcel C Baseline 2032 m2

File : Parcel C Total Baseline 2032 m2.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	
Cs-137	1.008E-12	0.000E+00	0.000E+00	0.000E+00	3.525E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.525E-10
Pb-210	6.277E-03	0.000E+00	0.000E+00	0.000E+00	2.195E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.195E+00
Ra-226	6.046E-03	0.000E+00	0.000E+00	0.000E+00	2.114E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.114E+00
Sr-90	6.125E-15	0.000E+00	0.000E+00	0.000E+00	2.141E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.141E-12
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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= 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.
Cs-137	4.068E-16	0.0000	2.079E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.428E-19	0.0000
Pb-210	5.411E-09	0.0005	4.481E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.754E-07	0.0166
Ra-226	1.035E-05	0.9797	3.967E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.525E-08	0.0024
Sr-90	1.791E-20	0.0000	4.574E-23	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.517E-21	0.0000
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	1.035E-05	0.9802	8.448E-09	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.006E-07	0.0190

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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

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Cs-137	0.000E+00	0.0000	4.070E-16	0.0000								
Pb-210	0.000E+00	0.0000	1.853E-07	0.0175								
Ra-226	0.000E+00	0.0000	1.038E-05	0.9825								
Sr-90	0.000E+00	0.0000	2.148E-20	0.0000								
===== Total	0.000E+00	0.0000	1.056E-05	1.0000								

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

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 CNRSI(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	fract.
Cs-137	4.068E-16	0.0000	2.079E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.428E-19	0.0000
Ra-226	1.035E-05	0.9802	8.448E-09	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.006E-07	0.0190
Sr-90	1.791E-20	0.0000	4.574E-23	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.517E-21	0.0000
===== Total	1.035E-05	0.9802	8.448E-09	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.006E-07	0.0190

Intrisk : Parcel C Baseline 2032 m2

File : Parcel C Total Baseline 2032 m2.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	4.070E-16	0.0000										
Ra-226	0.000E+00	0.0000	1.056E-05	1.0000										
Sr-90	0.000E+00	0.0000	2.148E-20	0.0000										
===== Total	0.000E+00	0.0000	1.056E-05	1.0000										

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

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Dose Conversion Factor (and Related) Parameter Summary  
 File: FGR 13 MORBIDITY

Menu	Parameter	Current Value	Base Case*	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2( 1)
B-1	Pb-210+D	2.320E-02	1.360E-02	DCF2( 2)
B-1	Ra-226+D	8.594E-03	8.580E-03	DCF2( 3)
B-1	Sr-90+D	1.308E-03	1.300E-03	DCF2( 4)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3( 1)
D-1	Pb-210+D	7.276E-03	5.370E-03	DCF3( 2)
D-1	Ra-226+D	1.321E-03	1.320E-03	DCF3( 3)
D-1	Sr-90+D	1.528E-04	1.420E-04	DCF3( 4)
D-34	Food transfer factors:			
D-34	Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF( 1,1)
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF( 1,2)
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF( 1,3)
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF( 2,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF( 2,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF( 2,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF( 3,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF( 3,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF( 3,3)
D-34				
D-34	Sr-90+D , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF( 4,1)
D-34	Sr-90+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-03	8.000E-03	RTF( 4,2)
D-34	Sr-90+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF( 4,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC( 1,1)
D-5	Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC( 1,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC( 2,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC( 2,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC( 3,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC( 3,2)
D-5				
D-5	Sr-90+D , fish	6.000E+01	6.000E+01	BIOFAC( 4,1)
D-5	Sr-90+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC( 4,2)

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

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	2.320E+02	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	2.000E+00	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	not used	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T( 2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T( 3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T( 4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T( 5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T( 6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T( 7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T( 8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T( 9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Cs-137	1.130E-01	0.000E+00	---	SI( 1)
R012	Initial principal radionuclide (pCi/g): Ra-226	1.000E+00	0.000E+00	---	SI( 3)
R012	Initial principal radionuclide (pCi/g): Sr-90	3.310E-01	0.000E+00	---	SI( 4)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	WI( 1)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	WI( 3)
R012	Concentration in groundwater (pCi/L): Sr-90	not used	0.000E+00	---	WI( 4)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	2.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.000E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	not used	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	not used	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	not used	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	not used	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	not used	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	not used	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	not used	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	not used	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	not used	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	not used	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	not used	ND	---	MODEL

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R014	Well pumping rate (m**3/yr)	not used	2.500E+02	---	UW
R015	Number of unsaturated zone strata	not used	1	---	NS
R015	Unsat. zone 1, thickness (m)	not used	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	not used	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	not used	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	not used	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	not used	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	not used	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	not used	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	4.600E+03	4.600E+03	---	DCNUCC( 1)
R016	Unsat. zone 1 (cm**3/g)	not used	4.600E+03	---	DCNUCU( 1,1)
R016	Saturated zone (cm**3/g)	not used	4.600E+03	---	DCNUCS( 1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.623E-05	ALEACH( 1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 1)
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC( 3)
R016	Unsat. zone 1 (cm**3/g)	not used	7.000E+01	---	DCNUCU( 3,1)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS( 3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.374E-03	ALEACH( 3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 3)
R016	Distribution coefficients for Sr-90				
R016	Contaminated zone (cm**3/g)	3.000E+01	3.000E+01	---	DCNUCC( 4)
R016	Unsat. zone 1 (cm**3/g)	not used	3.000E+01	---	DCNUCU( 4,1)
R016	Saturated zone (cm**3/g)	not used	3.000E+01	---	DCNUCS( 4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.516E-03	ALEACH( 4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 4)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC( 2)
R016	Unsat. zone 1 (cm**3/g)	not used	1.000E+02	---	DCNUCU( 2,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS( 2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.663E-03	ALEACH( 2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 2)
R017	Inhalation rate (m**3/yr)	7.270E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	2.400E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	9.590E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE( 1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE( 2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE( 3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE( 4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE( 5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE( 6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE( 7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE( 8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE( 9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA( 1)
R017	Ring 2	not used	2.732E-01	---	FRACA( 2)
R017	Ring 3	not used	0.000E+00	---	FRACA( 3)
R017	Ring 4	not used	0.000E+00	---	FRACA( 4)
R017	Ring 5	not used	0.000E+00	---	FRACA( 5)
R017	Ring 6	not used	0.000E+00	---	FRACA( 6)
R017	Ring 7	not used	0.000E+00	---	FRACA( 7)
R017	Ring 8	not used	0.000E+00	---	FRACA( 8)
R017	Ring 9	not used	0.000E+00	---	FRACA( 9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	not used	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	not used	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	not used	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	not used	-1	---	FPLANT
R018	Contamination fraction of meat	not used	-1	---	FMEAT
R018	Contamination fraction of milk	not used	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	not used	5.000E-01	---	LSI
R019	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	---	MLFD

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	not used	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	not used	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	not used	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	not used	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	not used	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	not used	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	not used	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	not used	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	not used	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
C14	DCF correction factor for gaseous forms of C14	not used	0.000E+00	---	CO2F
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA (1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA (2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	257	---	---	KYMAX

Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	active
2 -- inhalation (w/o radon)	active
3 -- plant ingestion	suppressed
4 -- meat ingestion	suppressed
5 -- milk ingestion	suppressed
6 -- aquatic foods	suppressed
7 -- drinking water	suppressed
8 -- soil ingestion	active
9 -- radon	suppressed
Find peak pathway doses	suppressed

Contaminated Zone Dimensions

Initial Soil Concentrations, pCi/g

Area:	232.00 square meters	Cs-137	1.130E-01
Thickness:	2.00 meters	Ra-226	1.000E+00
Cover Depth:	0.00 meters	Sr-90	3.310E-01

Total Dose TDOSE(t), mrem/yr

Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	9.370E+00	9.340E+00	9.279E+00	9.072E+00	8.518E+00	6.919E+00	3.931E+00	5.510E-01
M(t):	3.748E-01	3.736E-01	3.712E-01	3.629E-01	3.407E-01	2.768E-01	1.572E-01	2.204E-02

Maximum TDOSE(t): 9.370E+00 mrem/yr at t = 0.000E+00 years

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	3.066E-01	0.0327	2.839E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.536E-05	0.0000
Ra-226	9.045E+00	0.9652	7.122E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.162E-02	0.0012
Sr-90	6.485E-03	0.0007	3.401E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.048E-04	0.0000
===== Total	9.358E+00	0.9986	7.465E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.207E-02	0.0013

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	3.066E-01	0.0327										
Ra-226	0.000E+00	0.0000	9.057E+00	0.9665										
Sr-90	0.000E+00	0.0000	6.923E-03	0.0007										
===== Total	0.000E+00	0.0000	9.370E+00	1.0000										

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	2.996E-01	0.0321	2.774E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.432E-05	0.0000
Ra-226	9.019E+00	0.9657	7.658E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.336E-02	0.0014
Sr-90	6.297E-03	0.0007	3.303E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.931E-04	0.0000
===== Total	9.325E+00	0.9984	7.991E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.380E-02	0.0015

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	2.996E-01	0.0321										
Ra-226	0.000E+00	0.0000	9.034E+00	0.9672										
Sr-90	0.000E+00	0.0000	6.723E-03	0.0007										
===== Total	0.000E+00	0.0000	9.340E+00	1.0000										

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	2.860E-01	0.0308	2.649E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.231E-05	0.0000
Ra-226	8.969E+00	0.9666	8.671E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.666E-02	0.0018
Sr-90	5.939E-03	0.0006	3.114E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.707E-04	0.0000
===== Total	9.261E+00	0.9981	8.985E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.708E-02	0.0018

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	2.860E-01	0.0308										
Ra-226	0.000E+00	0.0000	8.987E+00	0.9685										
Sr-90	0.000E+00	0.0000	6.340E-03	0.0007										
===== Total	0.000E+00	0.0000	9.279E+00	1.0000										

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	2.432E-01	0.0268	2.253E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.599E-05	0.0000
Ra-226	8.796E+00	0.9696	1.167E-03	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.648E-02	0.0029
Sr-90	4.837E-03	0.0005	2.537E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.019E-04	0.0000
===== Total	9.044E+00	0.9969	1.193E-03	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.682E-02	0.0030

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	2.433E-01	0.0268										
Ra-226	0.000E+00	0.0000	8.823E+00	0.9726										
Sr-90	0.000E+00	0.0000	5.164E-03	0.0006										
===== Total	0.000E+00	0.0000	9.072E+00	1.0000										

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	1.531E-01	0.0180	1.418E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.265E-05	0.0000
Ra-226	8.317E+00	0.9764	1.683E-03	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.356E-02	0.0051
Sr-90	2.691E-03	0.0003	1.411E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.680E-04	0.0000
===== Total	8.473E+00	0.9947	1.697E-03	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.375E-02	0.0051

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	1.531E-01	0.0180										
Ra-226	0.000E+00	0.0000	8.362E+00	0.9817										
Sr-90	0.000E+00	0.0000	2.873E-03	0.0003										
===== Total	0.000E+00	0.0000	8.518E+00	1.0000										

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	3.031E-02	0.0044	2.807E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.484E-06	0.0000
Ra-226	6.835E+00	0.9878	1.892E-03	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.208E-02	0.0075
Sr-90	3.456E-04	0.0000	1.812E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.157E-05	0.0000
===== Total	6.865E+00	0.9922	1.894E-03	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.210E-02	0.0075

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	3.031E-02	0.0044										
Ra-226	0.000E+00	0.0000	6.889E+00	0.9956										
Sr-90	0.000E+00	0.0000	3.690E-04	0.0001										
===== Total	0.000E+00	0.0000	6.919E+00	1.0000										

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	2.961E-04	0.0001	2.743E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.381E-08	0.0000
Ra-226	3.899E+00	0.9918	1.120E-03	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.100E-02	0.0079
Sr-90	9.815E-07	0.0000	5.148E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.127E-08	0.0000
===== Total	3.899E+00	0.9918	1.120E-03	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.100E-02	0.0079

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	2.962E-04	0.0001										
Ra-226	0.000E+00	0.0000	3.931E+00	0.9999										
Sr-90	0.000E+00	0.0000	1.048E-06	0.0000										
===== Total	0.000E+00	0.0000	3.931E+00	1.0000										

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	2.732E-11	0.0000	2.530E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.042E-15	0.0000
Ra-226	5.465E-01	0.9918	1.570E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.347E-03	0.0079
Sr-90	1.199E-15	0.0000	6.286E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.481E-17	0.0000
===== Total	5.465E-01	0.9918	1.570E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.347E-03	0.0079

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	2.732E-11	0.0000										
Ra-226	0.000E+00	0.0000	5.510E-01	1.0000										
Sr-90	0.000E+00	0.0000	1.280E-15	0.0000										
===== Total	0.000E+00	0.0000	5.510E-01	1.0000										

\*Sum of all water independent and dependent pathways.

Dose/Source Ratios Summed Over All Pathways  
 Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137+D	Cs-137+D	1.000E+00	2.713E+00	2.651E+00	2.531E+00	2.153E+00	1.355E+00	2.682E-01	2.621E-03	2.418E-10
Ra-226+D	Ra-226+D	1.000E+00	9.056E+00	9.031E+00	8.980E+00	8.805E+00	8.325E+00	6.840E+00	3.901E+00	5.469E-01
Ra-226+D	Pb-210+D	1.000E+00	1.014E-03	2.994E-03	6.748E-03	1.795E-02	3.767E-02	4.914E-02	2.948E-02	4.133E-03
Ra-226+D	§DSR(j)		9.057E+00	9.034E+00	8.987E+00	8.823E+00	8.362E+00	6.889E+00	3.931E+00	5.510E-01
Sr-90+D	Sr-90+D	1.000E+00	2.092E-02	2.031E-02	1.916E-02	1.560E-02	8.679E-03	1.115E-03	3.166E-06	3.866E-15

§ is used to indicate summation; the Greek sigma is not included in this font.  
 The DSR includes contributions from associated (half-life <= 180 days) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g  
 Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Nuclide (i)	t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137	9.214E+00	9.429E+00	9.876E+00	1.161E+01	1.845E+01	9.320E+01	9.538E+03	1.034E+11	
Ra-226	2.760E+00	2.767E+00	2.782E+00	2.833E+00	2.990E+00	3.629E+00	6.360E+00	4.537E+01	
Sr-90	1.195E+03	1.231E+03	1.305E+03	1.602E+03	2.880E+03	2.243E+04	7.896E+06	*1.365E+14	

\*At specific activity limit

Summed Dose/Source Ratios DSR(i,t) in (mrem/yr)/(pCi/g)  
 and Single Radionuclide Soil Guidelines G(i,t) in pCi/g  
 at tmin = time of minimum single radionuclide soil guideline  
 and at tmax = time of maximum total dose = 0.000E+00 years

Nuclide (i)	Initial (pCi/g)	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Cs-137	1.130E-01	0.000E+00	2.713E+00	9.214E+00	2.713E+00	9.214E+00
Ra-226	1.000E+00	0.000E+00	9.057E+00	2.760E+00	9.057E+00	2.760E+00
Sr-90	3.310E-01	0.000E+00	2.092E-02	1.195E+03	2.092E-02	1.195E+03

Individual Nuclide Dose Summed Over All Pathways  
 Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	DOSE(j,t), mrem/yr								
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	
Cs-137	Cs-137	1.000E+00	3.066E-01	2.996E-01	2.860E-01	2.433E-01	1.531E-01	3.031E-02	2.962E-04	2.732E-11	
Ra-226	Ra-226	1.000E+00	9.056E+00	9.031E+00	8.980E+00	8.805E+00	8.325E+00	6.840E+00	3.901E+00	5.469E-01	
Pb-210	Ra-226	1.000E+00	1.014E-03	2.994E-03	6.748E-03	1.795E-02	3.767E-02	4.914E-02	2.948E-02	4.133E-03	
Sr-90	Sr-90	1.000E+00	6.923E-03	6.723E-03	6.340E-03	5.164E-03	2.873E-03	3.690E-04	1.048E-06	1.280E-15	

THF(i) is the thread fraction of the parent nuclide.  
 § is used to indicate summation; the Greek sigma is not included in this font.

Individual Nuclide Soil Concentration  
 Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g								
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	
Cs-137	Cs-137	1.000E+00	1.130E-01	1.104E-01	1.054E-01	8.966E-02	5.644E-02	1.117E-02	1.092E-04	1.007E-11	
Ra-226	Ra-226	1.000E+00	1.000E+00	9.972E-01	9.916E-01	9.723E-01	9.192E-01	7.553E-01	4.308E-01	6.039E-02	
Pb-210	Ra-226	1.000E+00	0.000E+00	3.054E-02	8.844E-02	2.612E-01	5.656E-01	7.448E-01	4.472E-01	6.270E-02	
Sr-90	Sr-90	1.000E+00	3.310E-01	3.214E-01	3.031E-01	2.469E-01	1.374E-01	1.764E-02	5.010E-05	6.118E-14	

THF(i) is the thread fraction of the parent nuclide.  
 § is used to indicate summation; the Greek sigma is not included in this font.

RESCALC.EXE execution time = 1.93 seconds

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Cancer Risk Slope Factors Summary Table  
 Risk Library: FGR 13 Morbidity

Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-1	Ground external radiation slope factors, 1/yr per (pCi/g):			
Sf-1	Cs-137+D	2.55E-06	5.32E-10	SLPF( 1,1)
Sf-1	Pb-210+D	4.21E-09	1.41E-09	SLPF( 2,1)
Sf-1	Ra-226+D	8.49E-06	2.29E-08	SLPF( 3,1)
Sf-1	Sr-90+D	1.96E-08	4.82E-10	SLPF( 4,1)
Sf-2	Inhalation, slope factors, 1/(pCi):			
Sf-2	Cs-137+D	1.12E-10	1.12E-10	SLPF( 1,2)
Sf-2	Pb-210+D	3.08E-08	1.58E-08	SLPF( 2,2)
Sf-2	Ra-226+D	2.83E-08	2.82E-08	SLPF( 3,2)
Sf-2	Sr-90+D	4.33E-10	4.25E-10	SLPF( 4,2)
Sf-3	Food ingestion, slope factors, 1/(pCi):			
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF( 1,3)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF( 2,3)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF( 3,3)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF( 4,3)
Sf-3	Water ingestion, slope factors, 1/(pCi):			
Sf-3	Cs-137+D	3.04E-11	3.04E-11	SLPF( 1,4)
Sf-3	Pb-210+D	2.66E-09	8.81E-10	SLPF( 2,4)
Sf-3	Ra-226+D	3.86E-10	3.85E-10	SLPF( 3,4)
Sf-3	Sr-90+D	7.40E-11	5.59E-11	SLPF( 4,4)
Sf-3	Soil ingestion, slope factors, 1/(pCi):			
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF( 1,5)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF( 2,5)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF( 3,5)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF( 4,5)
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	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)

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

Risk Slope and Environmental Transport Factors for the Ground Pathway

Nuclide (i)	Slope(i)* t=	ETFG(i,t) At Time in Years (dimensionless)							
		0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
At-218	3.570E-09	8.421E-01	8.421E-01	8.421E-01	8.421E-01	8.421E-01	8.421E-01	8.421E-01	8.421E-01
Ba-137m	2.690E-06	8.045E-01	8.045E-01	8.045E-01	8.045E-01	8.045E-01	8.045E-01	8.045E-01	8.045E-01
Bi-210	2.760E-09	8.226E-01	8.226E-01	8.226E-01	8.226E-01	8.226E-01	8.226E-01	8.226E-01	8.226E-01
Bi-214	7.480E-06	8.083E-01	8.083E-01	8.083E-01	8.083E-01	8.083E-01	8.083E-01	8.083E-01	8.083E-01
Cs-137	5.320E-10	8.356E-01	8.356E-01	8.356E-01	8.356E-01	8.356E-01	8.356E-01	8.356E-01	8.356E-01
Pb-210	1.410E-09	8.434E-01	8.434E-01	8.434E-01	8.434E-01	8.434E-01	8.434E-01	8.434E-01	8.434E-01
Pb-214	9.820E-07	8.214E-01	8.214E-01	8.214E-01	8.214E-01	8.214E-01	8.214E-01	8.214E-01	8.214E-01
Po-210	3.950E-11	8.067E-01	8.067E-01	8.067E-01	8.067E-01	8.067E-01	8.067E-01	8.067E-01	8.067E-01
Po-214	3.860E-10	8.046E-01	8.046E-01	8.046E-01	8.046E-01	8.046E-01	8.046E-01	8.046E-01	8.045E-01
Po-218	4.260E-11	8.067E-01	8.067E-01	8.067E-01	8.067E-01	8.067E-01	8.067E-01	8.067E-01	8.067E-01
Ra-226	2.290E-08	8.399E-01	8.399E-01	8.399E-01	8.399E-01	8.399E-01	8.399E-01	8.399E-01	8.399E-01
Rn-222	1.740E-09	8.056E-01	8.056E-01	8.056E-01	8.056E-01	8.056E-01	8.056E-01	8.056E-01	8.056E-01
Sr-90	4.820E-10	8.396E-01	8.396E-01	8.396E-01	8.396E-01	8.396E-01	8.396E-01	8.396E-01	8.396E-01
Tl-210	0.000E+00	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01
Y-90	1.910E-08	8.067E-01	8.067E-01	8.067E-01	8.067E-01	8.067E-01	8.067E-01	8.067E-01	8.067E-01
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

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

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	
Cs-137	9.004E-03	0.000E+00	0.000E+00	0.000E+00	9.177E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.177E-01
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	7.968E-02	0.000E+00	0.000E+00	0.000E+00	8.121E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.121E+00
Sr-90	2.637E-02	0.000E+00	0.000E+00	0.000E+00	2.688E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.688E+00

\* 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

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= 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.
Cs-137	4.261E-06	0.0259	1.857E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.320E-10	0.0000
Pb-210	2.388E-08	0.0001	1.676E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.912E-07	0.0012
Ra-226	1.595E-04	0.9712	5.228E-08	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.702E-08	0.0006
Sr-90	9.019E-08	0.0005	1.970E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.414E-09	0.0000
Total	1.639E-04	0.9978	6.926E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.933E-07	0.0018

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.								
Cs-137	0.000E+00	0.0000	4.262E-06	0.0259								
Pb-210	0.000E+00	0.0000	2.319E-07	0.0014								
Ra-226	0.000E+00	0.0000	1.597E-04	0.9721								
Sr-90	0.000E+00	0.0000	9.480E-08	0.0006								
===== Total	0.000E+00	0.0000	1.643E-04	1.0000								

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

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 CNRSI(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.
Cs-137	4.261E-06	0.0259	1.857E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.320E-10	0.0000
Ra-226	1.595E-04	0.9713	6.904E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.882E-07	0.0018
Sr-90	9.019E-08	0.0005	1.970E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.414E-09	0.0000
===== Total	1.639E-04	0.9978	6.926E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.933E-07	0.0018

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	4.262E-06	0.0259										
Ra-226	0.000E+00	0.0000	1.599E-04	0.9735										
Sr-90	0.000E+00	0.0000	9.480E-08	0.0006										
===== Total	0.000E+00	0.0000	1.643E-04	1.0000										

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

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	
Cs-137	8.798E-03	0.000E+00	0.000E+00	0.000E+00	8.967E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.967E-01
Pb-210	2.433E-03	0.000E+00	0.000E+00	0.000E+00	2.480E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.480E-01
Ra-226	7.946E-02	0.000E+00	0.000E+00	0.000E+00	8.098E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.098E+00
Sr-90	2.561E-02	0.000E+00	0.000E+00	0.000E+00	2.610E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.610E+00

\* 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= 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

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.
Cs-137	4.164E-06	0.0254	1.815E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.176E-10	0.0000
Pb-210	2.558E-08	0.0002	1.796E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.049E-07	0.0013
Ra-226	1.591E-04	0.9716	5.214E-08	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.675E-08	0.0006
Sr-90	8.758E-08	0.0005	1.913E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.287E-09	0.0000
Total	1.634E-04	0.9977	7.030E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.065E-07	0.0019

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.								
Cs-137	0.000E+00	0.0000	4.164E-06	0.0254								
Pb-210	0.000E+00	0.0000	2.484E-07	0.0015								
Ra-226	0.000E+00	0.0000	1.592E-04	0.9725								
Sr-90	0.000E+00	0.0000	9.206E-08	0.0006								
===== Total	0.000E+00	0.0000	1.637E-04	1.0000								

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

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

Total Excess Cancer Risk CNRSI(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.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Cs-137	4.164E-06	0.0254	1.815E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.176E-10	0.0000
Ra-226	1.591E-04	0.9717	7.009E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.016E-07	0.0018
Sr-90	8.758E-08	0.0005	1.913E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.287E-09	0.0000
===== Total	1.634E-04	0.9977	7.030E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.065E-07	0.0019

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	4.164E-06	0.0254										
Ra-226	0.000E+00	0.0000	1.595E-04	0.9740										
Sr-90	0.000E+00	0.0000	9.206E-08	0.0006										
===== Total	0.000E+00	0.0000	1.637E-04	1.0000										

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

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	
Cs-137	8.400E-03	0.000E+00	0.000E+00	0.000E+00	8.561E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.561E-01
Pb-210	7.047E-03	0.000E+00	0.000E+00	0.000E+00	7.182E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.182E-01
Ra-226	7.901E-02	0.000E+00	0.000E+00	0.000E+00	8.053E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.053E+00
Sr-90	2.415E-02	0.000E+00	0.000E+00	0.000E+00	2.462E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.462E+00

\* 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

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 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.
Cs-137	3.975E-06	0.0244	1.733E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.896E-10	0.0000
Pb-210	2.881E-08	0.0002	2.022E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.307E-07	0.0014
Ra-226	1.582E-04	0.9724	5.184E-08	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.621E-08	0.0006
Sr-90	8.260E-08	0.0005	1.804E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.043E-09	0.0000
Total	1.623E-04	0.9975	7.226E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.316E-07	0.0020

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.								
Cs-137	0.000E+00	0.0000	3.976E-06	0.0244								
Pb-210	0.000E+00	0.0000	2.798E-07	0.0017								
Ra-226	0.000E+00	0.0000	1.583E-04	0.9733								
Sr-90	0.000E+00	0.0000	8.682E-08	0.0005								
===== Total	0.000E+00	0.0000	1.627E-04	1.0000								

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

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 CNRSI(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.
Cs-137	3.975E-06	0.0244	1.733E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.896E-10	0.0000
Ra-226	1.582E-04	0.9726	7.207E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.269E-07	0.0020
Sr-90	8.260E-08	0.0005	1.804E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.043E-09	0.0000
===== Total	1.623E-04	0.9975	7.226E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.316E-07	0.0020

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	3.976E-06	0.0244										
Ra-226	0.000E+00	0.0000	1.586E-04	0.9750										
Sr-90	0.000E+00	0.0000	8.682E-08	0.0005										
===== Total	0.000E+00	0.0000	1.627E-04	1.0000										

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

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	
Cs-137	7.144E-03	0.000E+00	0.000E+00	0.000E+00	7.281E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.281E-01
Pb-210	2.081E-02	0.000E+00	0.000E+00	0.000E+00	2.121E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.121E+00
Ra-226	7.747E-02	0.000E+00	0.000E+00	0.000E+00	7.896E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.896E+00
Sr-90	1.967E-02	0.000E+00	0.000E+00	0.000E+00	2.005E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.005E+00

\* 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= 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

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.
Cs-137	3.381E-06	0.0213	1.473E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.014E-10	0.0000
Pb-210	3.838E-08	0.0002	2.693E-08	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.073E-07	0.0019
Ra-226	1.551E-04	0.9750	5.084E-08	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.433E-08	0.0006
Sr-90	6.727E-08	0.0004	1.469E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.293E-09	0.0000
Total	1.586E-04	0.9970	7.793E-08	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.054E-07	0.0025

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.								
Cs-137	0.000E+00	0.0000	3.381E-06	0.0213								
Pb-210	0.000E+00	0.0000	3.726E-07	0.0023								
Ra-226	0.000E+00	0.0000	1.553E-04	0.9760								
Sr-90	0.000E+00	0.0000	7.071E-08	0.0004								
===== Total	0.000E+00	0.0000	1.591E-04	1.0000								

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

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 CNRSI(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.
Cs-137	3.381E-06	0.0213	1.473E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.014E-10	0.0000
Ra-226	1.551E-04	0.9753	7.777E-08	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.017E-07	0.0025
Sr-90	6.727E-08	0.0004	1.469E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.293E-09	0.0000
===== Total	1.586E-04	0.9970	7.793E-08	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.054E-07	0.0025

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	3.381E-06	0.0213										
Ra-226	0.000E+00	0.0000	1.556E-04	0.9783										
Sr-90	0.000E+00	0.0000	7.071E-08	0.0004										
===== Total	0.000E+00	0.0000	1.591E-04	1.0000										

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

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As pCi/yr at t= 3.000E+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	
Cs-137	4.497E-03	0.000E+00	0.000E+00	0.000E+00	4.583E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.583E-01
Pb-210	4.507E-02	0.000E+00	0.000E+00	0.000E+00	4.593E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.593E+00
Ra-226	7.325E-02	0.000E+00	0.000E+00	0.000E+00	7.465E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.465E+00
Sr-90	1.094E-02	0.000E+00	0.000E+00	0.000E+00	1.115E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.115E+00

\* 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+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

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p) and Fraction of Total Risk at t= 3.000E+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.
Cs-137	2.128E-06	0.0142	9.275E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.157E-10	0.0000
Pb-210	5.478E-08	0.0004	3.845E-08	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.387E-07	0.0029
Ra-226	1.466E-04	0.9810	4.806E-08	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.918E-08	0.0006
Sr-90	3.743E-08	0.0003	8.174E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.832E-09	0.0000
Total	1.489E-04	0.9959	8.660E-08	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.300E-07	0.0035

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Cs-137	0.000E+00	0.0000	2.129E-06	0.0142								
Pb-210	0.000E+00	0.0000	5.319E-07	0.0036								
Ra-226	0.000E+00	0.0000	1.468E-04	0.9819								
Sr-90	0.000E+00	0.0000	3.934E-08	0.0003								
===== Total	0.000E+00	0.0000	1.495E-04	1.0000								

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

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of  
 Radon and its Decay Products at t= 3.000E+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 CNRSI(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
 and Fraction of Total Risk at t= 3.000E+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.
Cs-137	2.128E-06	0.0142	9.275E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.157E-10	0.0000
Ra-226	1.467E-04	0.9814	8.651E-08	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.278E-07	0.0035
Sr-90	3.743E-08	0.0003	8.174E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.832E-09	0.0000
===== Total	1.489E-04	0.9959	8.660E-08	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.300E-07	0.0035

Total Excess Cancer Risk CNRSI(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
 and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.										
Cs-137	0.000E+00	0.0000	2.129E-06	0.0142										
Ra-226	0.000E+00	0.0000	1.473E-04	0.9855										
Sr-90	0.000E+00	0.0000	3.934E-08	0.0003										
===== Total	0.000E+00	0.0000	1.495E-04	1.0000										

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

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	
Cs-137	8.901E-04	0.000E+00	0.000E+00	0.000E+00	9.071E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.071E-02
Pb-210	5.935E-02	0.000E+00	0.000E+00	0.000E+00	6.049E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.049E+00
Ra-226	6.018E-02	0.000E+00	0.000E+00	0.000E+00	6.133E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.133E+00
Sr-90	1.406E-03	0.000E+00	0.000E+00	0.000E+00	1.433E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.433E-01

\* 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= 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

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.
Cs-137	4.212E-07	0.0035	1.836E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.248E-11	0.0000
Pb-210	6.126E-08	0.0005	4.300E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.906E-07	0.0040
Ra-226	1.205E-04	0.9907	3.949E-08	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.328E-08	0.0006
Sr-90	4.807E-09	0.0000	1.050E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.353E-10	0.0000
Total	1.210E-04	0.9947	8.250E-08	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.642E-07	0.0046

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.								
Cs-137	0.000E+00	0.0000	4.213E-07	0.0035								
Pb-210	0.000E+00	0.0000	5.948E-07	0.0049								
Ra-226	0.000E+00	0.0000	1.206E-04	0.9916								
Sr-90	0.000E+00	0.0000	5.052E-09	0.0000								
===== Total	0.000E+00	0.0000	1.216E-04	1.0000								

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

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 CNRSI(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
 and Fraction of Total Risk at t= 1.000E+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.
Cs-137	4.212E-07	0.0035	1.836E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.248E-11	0.0000
Ra-226	1.205E-04	0.9912	8.248E-08	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.639E-07	0.0046
Sr-90	4.807E-09	0.0000	1.050E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.353E-10	0.0000
===== Total	1.210E-04	0.9947	8.250E-08	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.642E-07	0.0046

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	4.213E-07	0.0035										
Ra-226	0.000E+00	0.0000	1.212E-04	0.9965										
Sr-90	0.000E+00	0.0000	5.052E-09	0.0000										
===== Total	0.000E+00	0.0000	1.216E-04	1.0000										

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

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	
Cs-137	8.698E-06	0.000E+00	0.000E+00	0.000E+00	8.865E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.865E-04
Pb-210	3.563E-02	0.000E+00	0.000E+00	0.000E+00	3.632E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.632E+00
Ra-226	3.433E-02	0.000E+00	0.000E+00	0.000E+00	3.499E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.499E+00
Sr-90	3.992E-06	0.000E+00	0.000E+00	0.000E+00	4.069E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.069E-04

\* 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+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

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.
Cs-137	4.116E-09	0.0001	1.794E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.105E-13	0.0000
Pb-210	3.624E-08	0.0005	2.544E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.902E-07	0.0042
Ra-226	6.873E-05	0.9939	2.252E-08	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.180E-08	0.0006
Sr-90	1.365E-11	0.0000	2.982E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.682E-13	0.0000
Total	6.877E-05	0.9945	4.796E-08	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.320E-07	0.0048

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.								
Cs-137	0.000E+00	0.0000	4.117E-09	0.0001								
Pb-210	0.000E+00	0.0000	3.519E-07	0.0051								
Ra-226	0.000E+00	0.0000	6.879E-05	0.9949								
Sr-90	0.000E+00	0.0000	1.435E-11	0.0000								
===== Total	0.000E+00	0.0000	6.915E-05	1.0000								

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

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 CNRSI(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
 and Fraction of Total Risk at t= 3.000E+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.
Cs-137	4.116E-09	0.0001	1.794E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.105E-13	0.0000
Ra-226	6.876E-05	0.9944	4.796E-08	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.320E-07	0.0048
Sr-90	1.365E-11	0.0000	2.982E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.682E-13	0.0000
===== Total	6.877E-05	0.9945	4.796E-08	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.320E-07	0.0048

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	4.117E-09	0.0001										
Ra-226	0.000E+00	0.0000	6.914E-05	0.9999										
Sr-90	0.000E+00	0.0000	1.435E-11	0.0000										
===== Total	0.000E+00	0.0000	6.915E-05	1.0000										

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

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	
Cs-137	8.023E-13	0.000E+00	0.000E+00	0.000E+00	8.177E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.177E-11
Pb-210	4.996E-03	0.000E+00	0.000E+00	0.000E+00	5.092E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.092E-01
Ra-226	4.812E-03	0.000E+00	0.000E+00	0.000E+00	4.904E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.904E-01
Sr-90	4.875E-15	0.000E+00	0.000E+00	0.000E+00	4.968E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.968E-13

\* 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= 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.
Cs-137	3.797E-16	0.0000	1.655E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.632E-20	0.0000
Pb-210	5.081E-09	0.0005	3.566E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.069E-08	0.0042
Ra-226	9.634E-06	0.9940	3.157E-09	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.859E-09	0.0006
Sr-90	1.667E-20	0.0000	3.641E-23	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.159E-22	0.0000
Total	9.639E-06	0.9945	6.723E-09	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.655E-08	0.0048

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.								
Cs-137	0.000E+00	0.0000	3.798E-16	0.0000								
Pb-210	0.000E+00	0.0000	4.933E-08	0.0051								
Ra-226	0.000E+00	0.0000	9.643E-06	0.9949								
Sr-90	0.000E+00	0.0000	1.752E-20	0.0000								
===== Total	0.000E+00	0.0000	9.692E-06	1.0000								

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

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 CNRSI(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	fract.
Cs-137	3.797E-16	0.0000	1.655E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.632E-20	0.0000
Ra-226	9.639E-06	0.9945	6.723E-09	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.655E-08	0.0048
Sr-90	1.667E-20	0.0000	3.641E-23	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.159E-22	0.0000
===== Total	9.639E-06	0.9945	6.723E-09	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.655E-08	0.0048

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	3.798E-16	0.0000										
Ra-226	0.000E+00	0.0000	9.692E-06	1.0000										
Sr-90	0.000E+00	0.0000	1.752E-20	0.0000										
===== Total	0.000E+00	0.0000	9.692E-06	1.0000										

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

Summary : Parcel C Baseline 4 in 2032 m2

File : Parcel C Total Baseline 4 in 2032 m2.rad

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Summary : Parcel C Baseline 4 in 2032 m2

File : Parcel C Total Baseline 4 in 2032 m2.rad

Dose Conversion Factor (and Related) Parameter Summary

File: FGR 13 MORBIDITY

Menu	Parameter	Current Value	Base Case*	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2( 1)
B-1	Pb-210+D	2.320E-02	1.360E-02	DCF2( 2)
B-1	Ra-226+D	8.594E-03	8.580E-03	DCF2( 3)
B-1	Sr-90+D	1.308E-03	1.300E-03	DCF2( 4)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3( 1)
D-1	Pb-210+D	7.276E-03	5.370E-03	DCF3( 2)
D-1	Ra-226+D	1.321E-03	1.320E-03	DCF3( 3)
D-1	Sr-90+D	1.528E-04	1.420E-04	DCF3( 4)
D-34	Food transfer factors:			
D-34	Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF( 1,1)
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF( 1,2)
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF( 1,3)
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF( 2,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF( 2,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF( 2,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF( 3,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF( 3,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF( 3,3)
D-34				
D-34	Sr-90+D , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF( 4,1)
D-34	Sr-90+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-03	8.000E-03	RTF( 4,2)
D-34	Sr-90+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF( 4,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC( 1,1)
D-5	Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC( 1,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC( 2,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC( 2,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC( 3,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC( 3,2)
D-5				
D-5	Sr-90+D , fish	6.000E+01	6.000E+01	BIOFAC( 4,1)
D-5	Sr-90+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC( 4,2)

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

Summary : Parcel C Baseline 4 in 2032 m2

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Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	2.032E+03	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	2.000E+00	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	not used	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T( 2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T( 3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T( 4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T( 5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T( 6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T( 7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T( 8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T( 9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Cs-137	1.130E-01	0.000E+00	---	SI( 1)
R012	Initial principal radionuclide (pCi/g): Ra-226	1.000E+00	0.000E+00	---	SI( 3)
R012	Initial principal radionuclide (pCi/g): Sr-90	3.310E-01	0.000E+00	---	SI( 4)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	WI( 1)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	WI( 3)
R012	Concentration in groundwater (pCi/L): Sr-90	not used	0.000E+00	---	WI( 4)
R013	Cover depth (m)	1.016E-01	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	1.500E+00	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	0.000E+00	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	2.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.000E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	not used	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	not used	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	not used	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	not used	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	not used	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	not used	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	not used	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	not used	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	not used	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	not used	1.000E+01	---	DWIBWT

Summary : Parcel C Baseline 4 in 2032 m2

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## Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	not used	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	not used	2.500E+02	---	UW
R015	Number of unsaturated zone strata	not used	1	---	NS
R015	Unsat. zone 1, thickness (m)	not used	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	not used	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	not used	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	not used	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	not used	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	not used	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	not used	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	4.600E+03	4.600E+03	---	DCNUCC( 1)
R016	Unsat. zone 1 (cm**3/g)	not used	4.600E+03	---	DCNUCU( 1,1)
R016	Saturated zone (cm**3/g)	not used	4.600E+03	---	DCNUCS( 1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.623E-05	ALEACH( 1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 1)
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC( 3)
R016	Unsat. zone 1 (cm**3/g)	not used	7.000E+01	---	DCNUCU( 3,1)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS( 3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.374E-03	ALEACH( 3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 3)
R016	Distribution coefficients for Sr-90				
R016	Contaminated zone (cm**3/g)	3.000E+01	3.000E+01	---	DCNUCC( 4)
R016	Unsat. zone 1 (cm**3/g)	not used	3.000E+01	---	DCNUCU( 4,1)
R016	Saturated zone (cm**3/g)	not used	3.000E+01	---	DCNUCS( 4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.516E-03	ALEACH( 4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 4)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC( 2)
R016	Unsat. zone 1 (cm**3/g)	not used	1.000E+02	---	DCNUCU( 2,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS( 2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.663E-03	ALEACH( 2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 2)
R017	Inhalation rate (m**3/yr)	7.270E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	2.400E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	9.590E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE( 1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE( 2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE( 3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE( 4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE( 5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE( 6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE( 7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE( 8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE( 9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA( 1)
R017	Ring 2	not used	2.732E-01	---	FRACA( 2)
R017	Ring 3	not used	0.000E+00	---	FRACA( 3)
R017	Ring 4	not used	0.000E+00	---	FRACA( 4)
R017	Ring 5	not used	0.000E+00	---	FRACA( 5)
R017	Ring 6	not used	0.000E+00	---	FRACA( 6)
R017	Ring 7	not used	0.000E+00	---	FRACA( 7)
R017	Ring 8	not used	0.000E+00	---	FRACA( 8)
R017	Ring 9	not used	0.000E+00	---	FRACA( 9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	not used	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	not used	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	not used	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	not used	-1	---	FPLANT
R018	Contamination fraction of meat	not used	-1	---	FMEAT
R018	Contamination fraction of milk	not used	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	not used	5.000E-01	---	LSI

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## Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R019	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	not used	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	not used	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	not used	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	not used	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	not used	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	not used	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	not used	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	not used	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	not used	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
C14	DCF correction factor for gaseous forms of C14	not used	0.000E+00	---	CO2F
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	257	---	---	KYMAX

Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	active
2 -- inhalation (w/o radon)	active
3 -- plant ingestion	suppressed
4 -- meat ingestion	suppressed
5 -- milk ingestion	suppressed
6 -- aquatic foods	suppressed
7 -- drinking water	suppressed
8 -- soil ingestion	active
9 -- radon	suppressed
Find peak pathway doses	suppressed

Summary : Parcel C Baseline 4 in 2032 m2

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Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	2032.00 square meters	Cs-137	1.130E-01
Thickness:	2.00 meters	Ra-226	1.000E+00
Cover Depth:	0.10 meters	Sr-90	3.310E-01

Total Dose TDOSE(t), mrem/yr

Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	3.054E+00	3.046E+00	3.031E+00	2.976E+00	2.819E+00	2.314E+00	1.317E+00	1.847E-01
M(t):	1.222E-01	1.219E-01	1.212E-01	1.191E-01	1.128E-01	9.256E-02	5.269E-02	7.386E-03

Maximum TDOSE(t): 3.054E+00 mrem/yr at t = 0.000E+00 years

Summary : Parcel C Baseline 4 in 2032 m2

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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	7.971E-02	0.0261	1.151E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.308E-05	0.0000
Ra-226	2.956E+00	0.9679	2.887E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.616E-02	0.0053
Sr-90	1.137E-03	0.0004	1.379E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.629E-04	0.0002
===== Total	3.037E+00	0.9944	3.027E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.679E-02	0.0055

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	7.977E-02	0.0261										
Ra-226	0.000E+00	0.0000	2.973E+00	0.9733										
Sr-90	0.000E+00	0.0000	1.714E-03	0.0006										
===== Total	0.000E+00	0.0000	3.054E+00	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 4 in 2032 m2

File : Parcel C Total Baseline 4 in 2032 m2.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	7.789E-02	0.0256	1.125E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.164E-05	0.0000
Ra-226	2.948E+00	0.9677	3.105E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.858E-02	0.0061
Sr-90	1.104E-03	0.0004	1.339E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.467E-04	0.0002
===== Total	3.027E+00	0.9936	3.240E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.919E-02	0.0063

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	7.795E-02	0.0256										
Ra-226	0.000E+00	0.0000	2.967E+00	0.9739										
Sr-90	0.000E+00	0.0000	1.664E-03	0.0005										
===== Total	0.000E+00	0.0000	3.046E+00	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 4 in 2032 m2

File : Parcel C Total Baseline 4 in 2032 m2.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	7.436E-02	0.0245	1.074E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.885E-05	0.0000
Ra-226	2.931E+00	0.9672	3.515E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.317E-02	0.0076
Sr-90	1.042E-03	0.0003	1.263E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.155E-04	0.0002
===== Total	3.007E+00	0.9920	3.643E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.375E-02	0.0078

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	7.442E-02	0.0246										
Ra-226	0.000E+00	0.0000	2.955E+00	0.9749										
Sr-90	0.000E+00	0.0000	1.570E-03	0.0005										
===== Total	0.000E+00	0.0000	3.031E+00	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 4 in 2032 m2

File : Parcel C Total Baseline 4 in 2032 m2.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	6.324E-02	0.0212	9.133E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.005E-05	0.0000
Ra-226	2.874E+00	0.9658	4.733E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.683E-02	0.0124
Sr-90	8.483E-04	0.0003	1.028E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.199E-04	0.0001
===== Total	2.938E+00	0.9873	4.837E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.730E-02	0.0125

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	6.329E-02	0.0213										
Ra-226	0.000E+00	0.0000	2.912E+00	0.9783										
Sr-90	0.000E+00	0.0000	1.278E-03	0.0004										
===== Total	0.000E+00	0.0000	2.976E+00	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 4 in 2032 m2

File : Parcel C Total Baseline 4 in 2032 m2.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	3.981E-02	0.0141	5.749E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.151E-05	0.0000
Ra-226	2.718E+00	0.9639	6.824E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.059E-02	0.0215
Sr-90	4.719E-04	0.0002	5.721E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.336E-04	0.0001
===== Total	2.758E+00	0.9782	6.882E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.085E-02	0.0216

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	3.984E-02	0.0141										
Ra-226	0.000E+00	0.0000	2.779E+00	0.9856										
Sr-90	0.000E+00	0.0000	7.112E-04	0.0003										
===== Total	0.000E+00	0.0000	2.819E+00	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 4 in 2032 m2

File : Parcel C Total Baseline 4 in 2032 m2.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	7.880E-03	0.0034	1.138E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.236E-06	0.0000
Ra-226	2.233E+00	0.9649	7.672E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.243E-02	0.0313
Sr-90	6.061E-05	0.0000	7.348E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.000E-05	0.0000
===== Total	2.241E+00	0.9684	7.679E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.246E-02	0.0313

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	7.886E-03	0.0034										
Ra-226	0.000E+00	0.0000	2.306E+00	0.9966										
Sr-90	0.000E+00	0.0000	9.135E-05	0.0000										
===== Total	0.000E+00	0.0000	2.314E+00	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 4 in 2032 m2

File : Parcel C Total Baseline 4 in 2032 m2.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	7.700E-05	0.0001	1.112E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.094E-08	0.0000
Ra-226	1.274E+00	0.9669	4.541E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.312E-02	0.0327
Sr-90	1.721E-07	0.0000	2.087E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.521E-08	0.0000
===== Total	1.274E+00	0.9669	4.541E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.312E-02	0.0327

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	7.706E-05	0.0001										
Ra-226	0.000E+00	0.0000	1.317E+00	0.9999										
Sr-90	0.000E+00	0.0000	2.594E-07	0.0000										
===== Total	0.000E+00	0.0000	1.317E+00	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 4 in 2032 m2

File : Parcel C Total Baseline 4 in 2032 m2.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	7.103E-12	0.0000	1.026E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.621E-15	0.0000
Ra-226	1.785E-01	0.9669	6.366E-05	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.045E-03	0.0327
Sr-90	2.102E-16	0.0000	2.548E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.040E-16	0.0000
===== Total	1.785E-01	0.9669	6.366E-05	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.045E-03	0.0327

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	7.109E-12	0.0000										
Ra-226	0.000E+00	0.0000	1.847E-01	1.0000										
Sr-90	0.000E+00	0.0000	3.168E-16	0.0000										
===== Total	0.000E+00	0.0000	1.847E-01	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 4 in 2032 m2

File : Parcel C Total Baseline 4 in 2032 m2.rad

Dose/Source Ratios Summed Over All Pathways  
 Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137+D	Cs-137+D	1.000E+00	7.060E-01	6.898E-01	6.586E-01	5.601E-01	3.526E-01	6.979E-02	6.820E-04	6.291E-11
Ra-226+D	Ra-226+D	1.000E+00	2.971E+00	2.963E+00	2.946E+00	2.889E+00	2.731E+00	2.244E+00	1.280E+00	1.794E-01
Ra-226+D	Pb-210+D	1.000E+00	1.280E-03	3.780E-03	8.520E-03	2.266E-02	4.755E-02	6.204E-02	3.722E-02	5.218E-03
Ra-226+D	\$DSR(j)		2.973E+00	2.967E+00	2.955E+00	2.912E+00	2.779E+00	2.306E+00	1.317E+00	1.847E-01
Sr-90+D	Sr-90+D	1.000E+00	5.178E-03	5.029E-03	4.742E-03	3.862E-03	2.149E-03	2.760E-04	7.838E-07	9.571E-16

§ is used to indicate summation; the Greek sigma is not included in this font.  
 The DSR includes contributions from associated (half-life <= 180 days) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g  
 Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Nuclide (i)	t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137		3.541E+01	3.624E+01	3.796E+01	4.463E+01	7.090E+01	3.582E+02	3.666E+04	3.974E+11
Ra-226		8.410E+00	8.427E+00	8.461E+00	8.586E+00	8.996E+00	1.084E+01	1.898E+01	1.354E+02
Sr-90		4.828E+03	4.971E+03	5.272E+03	6.473E+03	1.163E+04	9.059E+04	3.189E+07	*1.365E+14

\*At specific activity limit

Summed Dose/Source Ratios DSR(i,t) in (mrem/yr)/(pCi/g)  
 and Single Radionuclide Soil Guidelines G(i,t) in pCi/g  
 at tmin = time of minimum single radionuclide soil guideline  
 and at tmax = time of maximum total dose = 0.000E+00 years

Nuclide (i)	Initial (pCi/g)	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Cs-137	1.130E-01	0.000E+00	7.060E-01	3.541E+01	7.060E-01	3.541E+01
Ra-226	1.000E+00	0.000E+00	2.973E+00	8.410E+00	2.973E+00	8.410E+00
Sr-90	3.310E-01	0.000E+00	5.178E-03	4.828E+03	5.178E-03	4.828E+03

Summary : Parcel C Baseline 4 in 2032 m2

File : Parcel C Total Baseline 4 in 2032 m2.rad

Individual Nuclide Dose Summed Over All Pathways  
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	DOSE(j,t), mrem/yr							
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137	Cs-137	1.000E+00	7.977E-02	7.795E-02	7.442E-02	6.329E-02	3.984E-02	7.886E-03	7.706E-05	7.109E-12
Ra-226	Ra-226	1.000E+00	2.971E+00	2.963E+00	2.946E+00	2.889E+00	2.731E+00	2.244E+00	1.280E+00	1.794E-01
Pb-210	Ra-226	1.000E+00	1.280E-03	3.780E-03	8.520E-03	2.266E-02	4.755E-02	6.204E-02	3.722E-02	5.218E-03
Sr-90	Sr-90	1.000E+00	1.714E-03	1.664E-03	1.570E-03	1.278E-03	7.112E-04	9.135E-05	2.594E-07	3.168E-16
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

THF(i) is the thread fraction of the parent nuclide.

§ is used to indicate summation; the Greek sigma is not included in this font.

Individual Nuclide Soil Concentration  
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g							
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137	Cs-137	1.000E+00	1.130E-01	1.104E-01	1.054E-01	8.966E-02	5.644E-02	1.117E-02	1.092E-04	1.007E-11
Ra-226	Ra-226	1.000E+00	1.000E+00	9.972E-01	9.916E-01	9.723E-01	9.192E-01	7.553E-01	4.308E-01	6.039E-02
Pb-210	Ra-226	1.000E+00	0.000E+00	3.054E-02	8.844E-02	2.612E-01	5.656E-01	7.448E-01	4.472E-01	6.270E-02
Sr-90	Sr-90	1.000E+00	3.310E-01	3.214E-01	3.031E-01	2.469E-01	1.374E-01	1.764E-02	5.010E-05	6.118E-14
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

THF(i) is the thread fraction of the parent nuclide.

§ is used to indicate summation; the Greek sigma is not included in this font.

RESCALC.EXE execution time = 2.08 seconds

Intrisk : Parcel C Baseline 4 in 2032 m2

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Cancer Risk Slope Factors Summary Table

Risk Library: FGR 13 Morbidity

Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-1	Ground external radiation slope factors, 1/yr per (pCi/g):			
Sf-1	Cs-137+D	2.55E-06	5.32E-10	SLPF( 1,1)
Sf-1	Pb-210+D	4.21E-09	1.41E-09	SLPF( 2,1)
Sf-1	Ra-226+D	8.49E-06	2.29E-08	SLPF( 3,1)
Sf-1	Sr-90+D	1.96E-08	4.82E-10	SLPF( 4,1)
Sf-2	Inhalation, slope factors, 1/(pCi):			
Sf-2	Cs-137+D	1.12E-10	1.12E-10	SLPF( 1,2)
Sf-2	Pb-210+D	3.08E-08	1.58E-08	SLPF( 2,2)
Sf-2	Ra-226+D	2.83E-08	2.82E-08	SLPF( 3,2)
Sf-2	Sr-90+D	4.33E-10	4.25E-10	SLPF( 4,2)
Sf-3	Food ingestion, slope factors, 1/(pCi):			
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF( 1,3)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF( 2,3)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF( 3,3)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF( 4,3)
Sf-3	Water ingestion, slope factors, 1/(pCi):			
Sf-3	Cs-137+D	3.04E-11	3.04E-11	SLPF( 1,4)
Sf-3	Pb-210+D	2.66E-09	8.81E-10	SLPF( 2,4)
Sf-3	Ra-226+D	3.86E-10	3.85E-10	SLPF( 3,4)
Sf-3	Sr-90+D	7.40E-11	5.59E-11	SLPF( 4,4)
Sf-3	Soil ingestion, slope factors, 1/(pCi):			
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF( 1,5)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF( 2,5)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF( 3,5)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF( 4,5)
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	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)

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

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Risk Slope and Environmental Transport Factors for the Ground Pathway

Nuclide (i)	Slope(i)* t=	ETFG(i,t) At Time in Years (dimensionless)							
		0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
At-218	3.570E-09	2.735E-03	2.735E-03	2.735E-03	2.735E-03	2.735E-03	2.735E-03	2.735E-03	2.735E-03
Ba-137m	2.690E-06	2.092E-01	2.092E-01	2.092E-01	2.092E-01	2.092E-01	2.092E-01	2.092E-01	2.092E-01
Bi-210	2.760E-09	1.097E-01	1.097E-01	1.097E-01	1.097E-01	1.097E-01	1.097E-01	1.097E-01	1.097E-01
Bi-214	7.480E-06	2.792E-01	2.792E-01	2.792E-01	2.792E-01	2.792E-01	2.792E-01	2.792E-01	2.792E-01
Cs-137	5.320E-10	7.432E-02	7.432E-02	7.432E-02	7.432E-02	7.432E-02	7.432E-02	7.432E-02	7.432E-02
Pb-210	1.410E-09	4.208E-04	4.208E-04	4.208E-04	4.208E-04	4.208E-04	4.208E-04	4.208E-04	4.208E-04
Pb-214	9.820E-07	1.626E-01	1.626E-01	1.626E-01	1.626E-01	1.626E-01	1.626E-01	1.626E-01	1.626E-01
Po-210	3.950E-11	2.255E-01	2.255E-01	2.255E-01	2.255E-01	2.255E-01	2.255E-01	2.255E-01	2.255E-01
Po-214	3.860E-10	2.298E-01	2.298E-01	2.298E-01	2.298E-01	2.298E-01	2.298E-01	2.298E-01	2.298E-01
Po-218	4.260E-11	2.303E-01	2.303E-01	2.303E-01	2.303E-01	2.303E-01	2.303E-01	2.303E-01	2.303E-01
Ra-226	2.290E-08	1.142E-01	1.142E-01	1.142E-01	1.142E-01	1.142E-01	1.142E-01	1.142E-01	1.142E-01
Rn-222	1.740E-09	1.986E-01	1.986E-01	1.986E-01	1.986E-01	1.986E-01	1.986E-01	1.986E-01	1.986E-01
Sr-90	4.820E-10	6.096E-02	6.096E-02	6.096E-02	6.096E-02	6.096E-02	6.096E-02	6.096E-02	6.096E-02
Tl-210	0.000E+00	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01
Y-90	1.910E-08	1.440E-01	1.440E-01	1.440E-01	1.440E-01	1.440E-01	1.440E-01	1.440E-01	1.440E-01
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* - Units are 1/yr per (pCi/g) at infinite depth and area. Multiplication by ETEG(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	
Cs-137	3.650E-03	0.000E+00	0.000E+00	0.000E+00	1.276E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.276E+00
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	3.230E-02	0.000E+00	0.000E+00	0.000E+00	1.129E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.129E+01
Sr-90	1.069E-02	0.000E+00	0.000E+00	0.000E+00	3.738E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.738E+00

\* 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

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= 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.
Cs-137	1.108E-06	0.0206	7.529E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.790E-10	0.0000
Pb-210	2.135E-09	0.0000	6.795E-09	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.660E-07	0.0049
Ra-226	5.224E-05	0.9710	2.120E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.349E-07	0.0025
Sr-90	1.586E-08	0.0003	7.986E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.139E-09	0.0001
Total	5.337E-05	0.9919	2.808E-08	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.079E-07	0.0076

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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 Dependent Pathways

Radio- Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Cs-137	0.000E+00	0.0000	1.109E-06	0.0206								
Pb-210	0.000E+00	0.0000	2.749E-07	0.0051								
Ra-226	0.000E+00	0.0000	5.240E-05	0.9739								
Sr-90	0.000E+00	0.0000	2.208E-08	0.0004								
===== Total	0.000E+00	0.0000	5.381E-05	1.0000								

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

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 CNRSI(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.
Cs-137	1.108E-06	0.0206	7.529E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.790E-10	0.0000
Ra-226	5.225E-05	0.9710	2.799E-08	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.009E-07	0.0075
Sr-90	1.586E-08	0.0003	7.986E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.139E-09	0.0001
===== Total	5.337E-05	0.9919	2.808E-08	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.079E-07	0.0076

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Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	1.109E-06	0.0206										
Ra-226	0.000E+00	0.0000	5.268E-05	0.9790										
Sr-90	0.000E+00	0.0000	2.208E-08	0.0004										
===== Total	0.000E+00	0.0000	5.381E-05	1.0000										

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

Intrisk : Parcel C Baseline 4 in 2032 m2

File : Parcel C Total Baseline 4 in 2032 m2.rad

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	
Cs-137	3.567E-03	0.000E+00	0.000E+00	0.000E+00	1.247E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.247E+00
Pb-210	9.864E-04	0.000E+00	0.000E+00	0.000E+00	3.449E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.449E-01
Ra-226	3.221E-02	0.000E+00	0.000E+00	0.000E+00	1.126E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.126E+01
Sr-90	1.038E-02	0.000E+00	0.000E+00	0.000E+00	3.630E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.630E+00

\* 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= 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

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 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.
Cs-137	1.083E-06	0.0202	7.357E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.589E-10	0.0000
Pb-210	2.288E-09	0.0000	7.280E-09	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.850E-07	0.0053
Ra-226	5.210E-05	0.9710	2.114E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.346E-07	0.0025
Sr-90	1.540E-08	0.0003	7.755E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.962E-09	0.0001
Total	5.320E-05	0.9915	2.850E-08	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.263E-07	0.0079

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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

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Cs-137	0.000E+00	0.0000	1.083E-06	0.0202								
Pb-210	0.000E+00	0.0000	2.945E-07	0.0055								
Ra-226	0.000E+00	0.0000	5.225E-05	0.9739								
Sr-90	0.000E+00	0.0000	2.144E-08	0.0004								
===== Total	0.000E+00	0.0000	5.365E-05	1.0000								

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

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

Total Excess Cancer Risk CNRSI(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.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Cs-137	1.083E-06	0.0202	7.357E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.589E-10	0.0000
Ra-226	5.210E-05	0.9711	2.842E-08	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.195E-07	0.0078
Sr-90	1.540E-08	0.0003	7.755E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.962E-09	0.0001
===== Total	5.320E-05	0.9915	2.850E-08	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.263E-07	0.0079

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Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	1.083E-06	0.0202										
Ra-226	0.000E+00	0.0000	5.255E-05	0.9794										
Sr-90	0.000E+00	0.0000	2.144E-08	0.0004										
===== Total	0.000E+00	0.0000	5.365E-05	1.0000										

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

Intrisk : Parcel C Baseline 4 in 2032 m2

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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	
Cs-137	3.405E-03	0.000E+00	0.000E+00	0.000E+00	1.191E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.191E+00
Pb-210	2.857E-03	0.000E+00	0.000E+00	0.000E+00	9.988E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.988E-01
Ra-226	3.203E-02	0.000E+00	0.000E+00	0.000E+00	1.120E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.120E+01
Sr-90	9.792E-03	0.000E+00	0.000E+00	0.000E+00	3.424E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.424E+00
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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

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 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.
Cs-137	1.034E-06	0.0194	7.024E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.201E-10	0.0000
Pb-210	2.576E-09	0.0000	8.198E-09	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.209E-07	0.0060
Ra-226	5.181E-05	0.9711	2.102E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.338E-07	0.0025
Sr-90	1.452E-08	0.0003	7.313E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.622E-09	0.0001
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	5.286E-05	0.9908	2.930E-08	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.611E-07	0.0086

Intrisk : Parcel C Baseline 4 in 2032 m2

File : Parcel C Total Baseline 4 in 2032 m2.rad

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.								
Cs-137	0.000E+00	0.0000	1.034E-06	0.0194								
Pb-210	0.000E+00	0.0000	3.317E-07	0.0062								
Ra-226	0.000E+00	0.0000	5.196E-05	0.9740								
Sr-90	0.000E+00	0.0000	2.022E-08	0.0004								
===== Total	0.000E+00	0.0000	5.335E-05	1.0000								

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

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 CNRSI(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.
Cs-137	1.034E-06	0.0194	7.024E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.201E-10	0.0000
Ra-226	5.181E-05	0.9712	2.922E-08	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.547E-07	0.0085
Sr-90	1.452E-08	0.0003	7.313E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.622E-09	0.0001
===== Total	5.286E-05	0.9908	2.930E-08	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.611E-07	0.0086

Intrisk : Parcel C Baseline 4 in 2032 m2

File : Parcel C Total Baseline 4 in 2032 m2.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	1.034E-06	0.0194										
Ra-226	0.000E+00	0.0000	5.229E-05	0.9802										
Sr-90	0.000E+00	0.0000	2.022E-08	0.0004										
===== Total	0.000E+00	0.0000	5.335E-05	1.0000										

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

Intrisk : Parcel C Baseline 4 in 2032 m2

File : Parcel C Total Baseline 4 in 2032 m2.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	
Cs-137	2.896E-03	0.000E+00	0.000E+00	0.000E+00	1.013E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.013E+00
Pb-210	8.437E-03	0.000E+00	0.000E+00	0.000E+00	2.950E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.950E+00
Ra-226	3.141E-02	0.000E+00	0.000E+00	0.000E+00	1.098E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.098E+01
Sr-90	7.975E-03	0.000E+00	0.000E+00	0.000E+00	2.788E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.788E+00

\* 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= 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

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.
Cs-137	8.791E-07	0.0168	5.973E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.974E-10	0.0000
Pb-210	3.431E-09	0.0001	1.092E-08	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.274E-07	0.0082
Ra-226	5.080E-05	0.9715	2.061E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.312E-07	0.0025
Sr-90	1.183E-08	0.0002	5.956E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.579E-09	0.0001
Total	5.169E-05	0.9886	3.159E-08	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.639E-07	0.0108

Intrisk : Parcel C Baseline 4 in 2032 m2

File : Parcel C Total Baseline 4 in 2032 m2.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

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Cs-137	0.000E+00	0.0000	8.798E-07	0.0168								
Pb-210	0.000E+00	0.0000	4.418E-07	0.0084								
Ra-226	0.000E+00	0.0000	5.095E-05	0.9744								
Sr-90	0.000E+00	0.0000	1.647E-08	0.0003								
===== Total	0.000E+00	0.0000	5.229E-05	1.0000								

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

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 CNRSI(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.
Cs-137	8.791E-07	0.0168	5.973E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.974E-10	0.0000
Ra-226	5.080E-05	0.9716	3.153E-08	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.586E-07	0.0107
Sr-90	1.183E-08	0.0002	5.956E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.579E-09	0.0001
===== Total	5.169E-05	0.9886	3.159E-08	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.639E-07	0.0108

Intrisk : Parcel C Baseline 4 in 2032 m2

File : Parcel C Total Baseline 4 in 2032 m2.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	8.798E-07	0.0168										
Ra-226	0.000E+00	0.0000	5.139E-05	0.9829										
Sr-90	0.000E+00	0.0000	1.647E-08	0.0003										
===== Total	0.000E+00	0.0000	5.229E-05	1.0000										

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

Intrisk : Parcel C Baseline 4 in 2032 m2

File : Parcel C Total Baseline 4 in 2032 m2.rad

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As pCi/yr at t= 3.000E+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	
Cs-137	1.823E-03	0.000E+00	0.000E+00	0.000E+00	6.374E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.374E-01
Pb-210	1.827E-02	0.000E+00	0.000E+00	0.000E+00	6.389E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.389E+00
Ra-226	2.969E-02	0.000E+00	0.000E+00	0.000E+00	1.038E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.038E+01
Sr-90	4.437E-03	0.000E+00	0.000E+00	0.000E+00	1.551E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.551E+00

\* 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+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

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p) and Fraction of Total Risk at t= 3.000E+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.
Cs-137	5.534E-07	0.0112	3.760E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.390E-10	0.0000
Pb-210	4.898E-09	0.0001	1.559E-08	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.101E-07	0.0124
Ra-226	4.803E-05	0.9729	1.948E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.240E-07	0.0025
Sr-90	6.580E-09	0.0001	3.314E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.548E-09	0.0001
Total	4.859E-05	0.9844	3.511E-08	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.371E-07	0.0149

Intrisk : Parcel C Baseline 4 in 2032 m2

File : Parcel C Total Baseline 4 in 2032 m2.rad

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Cs-137	0.000E+00	0.0000	5.538E-07	0.0112								
Pb-210	0.000E+00	0.0000	6.306E-07	0.0128								
Ra-226	0.000E+00	0.0000	4.817E-05	0.9758								
Sr-90	0.000E+00	0.0000	9.161E-09	0.0002								
===== Total	0.000E+00	0.0000	4.936E-05	1.0000								

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

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of  
Radon and its Decay Products at t= 3.000E+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 CNRSI(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 3.000E+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.
Cs-137	5.534E-07	0.0112	3.760E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.390E-10	0.0000
Ra-226	4.803E-05	0.9730	3.507E-08	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.341E-07	0.0149
Sr-90	6.580E-09	0.0001	3.314E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.548E-09	0.0001
===== Total	4.859E-05	0.9844	3.511E-08	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.371E-07	0.0149

Intrisk : Parcel C Baseline 4 in 2032 m2

File : Parcel C Total Baseline 4 in 2032 m2.rad

Total Excess Cancer Risk CNRSI(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.										
Cs-137	0.000E+00	0.0000	5.538E-07	0.0112										
Ra-226	0.000E+00	0.0000	4.880E-05	0.9886										
Sr-90	0.000E+00	0.0000	9.161E-09	0.0002										
===== Total	0.000E+00	0.0000	4.936E-05	1.0000										

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

Intrisk : Parcel C Baseline 4 in 2032 m2

File : Parcel C Total Baseline 4 in 2032 m2.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	
Cs-137	3.608E-04	0.000E+00	0.000E+00	0.000E+00	1.262E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.262E-01
Pb-210	2.406E-02	0.000E+00	0.000E+00	0.000E+00	8.413E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.413E+00
Ra-226	2.440E-02	0.000E+00	0.000E+00	0.000E+00	8.530E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.530E+00
Sr-90	5.698E-04	0.000E+00	0.000E+00	0.000E+00	1.992E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.992E-01
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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= 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

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.
Cs-137	1.095E-07	0.0027	7.443E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.689E-11	0.0000
Pb-210	5.477E-09	0.0001	1.743E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.823E-07	0.0169
Ra-226	3.946E-05	0.9769	1.601E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.019E-07	0.0025
Sr-90	8.451E-10	0.0000	4.256E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.272E-10	0.0000
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	3.957E-05	0.9797	3.345E-08	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.846E-07	0.0194

Intrisk : Parcel C Baseline 4 in 2032 m2

File : Parcel C Total Baseline 4 in 2032 m2.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

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Cs-137	0.000E+00	0.0000	1.096E-07	0.0027								
Pb-210	0.000E+00	0.0000	7.052E-07	0.0175								
Ra-226	0.000E+00	0.0000	3.958E-05	0.9798								
Sr-90	0.000E+00	0.0000	1.177E-09	0.0000								
===== Total	0.000E+00	0.0000	4.039E-05	1.0000								

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

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 CNRSI(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 1.000E+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.
Cs-137	1.095E-07	0.0027	7.443E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.689E-11	0.0000
Ra-226	3.946E-05	0.9770	3.344E-08	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.842E-07	0.0194
Sr-90	8.451E-10	0.0000	4.256E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.272E-10	0.0000
===== Total	3.957E-05	0.9797	3.345E-08	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.846E-07	0.0194

Intrisk : Parcel C Baseline 4 in 2032 m2

File : Parcel C Total Baseline 4 in 2032 m2.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	1.096E-07	0.0027										
Ra-226	0.000E+00	0.0000	4.028E-05	0.9973										
Sr-90	0.000E+00	0.0000	1.177E-09	0.0000										
===== Total	0.000E+00	0.0000	4.039E-05	1.0000										

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

Intrisk : Parcel C Baseline 4 in 2032 m2

File : Parcel C Total Baseline 4 in 2032 m2.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	
Cs-137	3.526E-06	0.000E+00	0.000E+00	0.000E+00	1.233E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.233E-03
Pb-210	1.445E-02	0.000E+00	0.000E+00	0.000E+00	5.051E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.051E+00
Ra-226	1.392E-02	0.000E+00	0.000E+00	0.000E+00	4.866E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.866E+00
Sr-90	1.618E-06	0.000E+00	0.000E+00	0.000E+00	5.659E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.659E-04

\* 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+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

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.
Cs-137	1.070E-09	0.0000	7.273E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.491E-13	0.0000
Pb-210	3.240E-09	0.0001	1.031E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.036E-07	0.0176
Ra-226	2.251E-05	0.9789	9.132E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.813E-08	0.0025
Sr-90	2.400E-12	0.0000	1.209E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.293E-13	0.0000
Total	2.251E-05	0.9791	1.944E-08	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.618E-07	0.0201

Intrisk : Parcel C Baseline 4 in 2032 m2

File : Parcel C Total Baseline 4 in 2032 m2.rad

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.								
Cs-137	0.000E+00	0.0000	1.071E-09	0.0000								
Pb-210	0.000E+00	0.0000	4.172E-07	0.0181								
Ra-226	0.000E+00	0.0000	2.258E-05	0.9818								
Sr-90	0.000E+00	0.0000	3.342E-12	0.0000								
===== Total	0.000E+00	0.0000	2.299E-05	1.0000								

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

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 CNRSI(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 3.000E+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.
Cs-137	1.070E-09	0.0000	7.273E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.491E-13	0.0000
Ra-226	2.251E-05	0.9790	1.944E-08	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.618E-07	0.0201
Sr-90	2.400E-12	0.0000	1.209E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.293E-13	0.0000
===== Total	2.251E-05	0.9791	1.944E-08	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.618E-07	0.0201

Intrisk : Parcel C Baseline 4 in 2032 m2

File : Parcel C Total Baseline 4 in 2032 m2.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	1.071E-09	0.0000										
Ra-226	0.000E+00	0.0000	2.299E-05	1.0000										
Sr-90	0.000E+00	0.0000	3.342E-12	0.0000										
===== Total	0.000E+00	0.0000	2.299E-05	1.0000										

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

Intrisk : Parcel C Baseline 4 in 2032 m2

File : Parcel C Total Baseline 4 in 2032 m2.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	
Cs-137	3.253E-13	0.000E+00	0.000E+00	0.000E+00	1.137E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.137E-10
Pb-210	2.025E-03	0.000E+00	0.000E+00	0.000E+00	7.081E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.081E-01
Ra-226	1.951E-03	0.000E+00	0.000E+00	0.000E+00	6.821E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.821E-01
Sr-90	1.976E-15	0.000E+00	0.000E+00	0.000E+00	6.910E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.910E-13
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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= 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.
Cs-137	9.873E-17	0.0000	6.709E-22	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.833E-20	0.0000
Pb-210	4.543E-10	0.0001	1.446E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.659E-08	0.0176
Ra-226	3.155E-06	0.9789	1.280E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.149E-09	0.0025
Sr-90	2.931E-21	0.0000	1.476E-23	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.135E-21	0.0000
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	3.156E-06	0.9791	2.726E-09	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.474E-08	0.0201

Intrisk : Parcel C Baseline 4 in 2032 m2

File : Parcel C Total Baseline 4 in 2032 m2.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 Dependent Pathways

Radio- Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Cs-137	0.000E+00	0.0000	9.881E-17	0.0000								
Pb-210	0.000E+00	0.0000	5.849E-08	0.0181								
Ra-226	0.000E+00	0.0000	3.165E-06	0.9819								
Sr-90	0.000E+00	0.0000	4.080E-21	0.0000								
===== Total	0.000E+00	0.0000	3.223E-06	1.0000								

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

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 CNRSI(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	fract.
Cs-137	9.873E-17	0.0000	6.709E-22	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.833E-20	0.0000
Ra-226	3.156E-06	0.9791	2.726E-09	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.474E-08	0.0201
Sr-90	2.931E-21	0.0000	1.476E-23	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.135E-21	0.0000
===== Total	3.156E-06	0.9791	2.726E-09	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.474E-08	0.0201

Intrisk : Parcel C Baseline 4 in 2032 m2

File : Parcel C Total Baseline 4 in 2032 m2.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	9.881E-17	0.0000										
Ra-226	0.000E+00	0.0000	3.223E-06	1.0000										
Sr-90	0.000E+00	0.0000	4.080E-21	0.0000										
===== Total	0.000E+00	0.0000	3.223E-06	1.0000										

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

Summary : Parcel C Baseline 4 in 232 m2

File : Parcel C Total Baseline 4 in 232 m2.rad

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Summary : Parcel C Baseline 4 in 232 m2

File : Parcel C Total Baseline 4 in 232 m2.rad

Dose Conversion Factor (and Related) Parameter Summary

File: FGR 13 MORBIDITY

Menu	Parameter	Current Value	Base Case*	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2( 1)
B-1	Pb-210+D	2.320E-02	1.360E-02	DCF2( 2)
B-1	Ra-226+D	8.594E-03	8.580E-03	DCF2( 3)
B-1	Sr-90+D	1.308E-03	1.300E-03	DCF2( 4)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3( 1)
D-1	Pb-210+D	7.276E-03	5.370E-03	DCF3( 2)
D-1	Ra-226+D	1.321E-03	1.320E-03	DCF3( 3)
D-1	Sr-90+D	1.528E-04	1.420E-04	DCF3( 4)
D-34	Food transfer factors:			
D-34	Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF( 1,1)
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF( 1,2)
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF( 1,3)
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF( 2,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF( 2,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF( 2,3)
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF( 3,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF( 3,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF( 3,3)
D-34	Sr-90+D , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF( 4,1)
D-34	Sr-90+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-03	8.000E-03	RTF( 4,2)
D-34	Sr-90+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF( 4,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC( 1,1)
D-5	Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC( 1,2)
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC( 2,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC( 2,2)
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC( 3,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC( 3,2)
D-5	Sr-90+D , fish	6.000E+01	6.000E+01	BIOFAC( 4,1)
D-5	Sr-90+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC( 4,2)

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

Summary : Parcel C Baseline 4 in 232 m2

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## Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	2.320E+02	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	2.000E+00	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	not used	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T( 2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T( 3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T( 4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T( 5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T( 6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T( 7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T( 8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T( 9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Cs-137	1.130E-01	0.000E+00	---	SI( 1)
R012	Initial principal radionuclide (pCi/g): Ra-226	1.000E+00	0.000E+00	---	SI( 3)
R012	Initial principal radionuclide (pCi/g): Sr-90	3.310E-01	0.000E+00	---	SI( 4)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	WI( 1)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	WI( 3)
R012	Concentration in groundwater (pCi/L): Sr-90	not used	0.000E+00	---	WI( 4)
R013	Cover depth (m)	1.016E-01	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	1.500E+00	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	0.000E+00	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	2.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.000E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	not used	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	not used	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	not used	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	not used	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	not used	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	not used	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	not used	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	not used	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	not used	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	not used	1.000E+01	---	DWIBWT

Summary : Parcel C Baseline 4 in 232 m2

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## Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	not used	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	not used	2.500E+02	---	UW
R015	Number of unsaturated zone strata	not used	1	---	NS
R015	Unsat. zone 1, thickness (m)	not used	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	not used	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	not used	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	not used	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	not used	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	not used	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	not used	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	4.600E+03	4.600E+03	---	DCNUCC( 1)
R016	Unsaturated zone 1 (cm**3/g)	not used	4.600E+03	---	DCNUCU( 1,1)
R016	Saturated zone (cm**3/g)	not used	4.600E+03	---	DCNUCS( 1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.623E-05	ALEACH( 1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 1)
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC( 3)
R016	Unsaturated zone 1 (cm**3/g)	not used	7.000E+01	---	DCNUCU( 3,1)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS( 3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.374E-03	ALEACH( 3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 3)
R016	Distribution coefficients for Sr-90				
R016	Contaminated zone (cm**3/g)	3.000E+01	3.000E+01	---	DCNUCC( 4)
R016	Unsaturated zone 1 (cm**3/g)	not used	3.000E+01	---	DCNUCU( 4,1)
R016	Saturated zone (cm**3/g)	not used	3.000E+01	---	DCNUCS( 4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.516E-03	ALEACH( 4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 4)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC( 2)
R016	Unsaturated zone 1 (cm**3/g)	not used	1.000E+02	---	DCNUCU( 2,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS( 2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.663E-03	ALEACH( 2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 2)
R017	Inhalation rate (m**3/yr)	7.270E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	2.400E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	9.590E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS

Summary : Parcel C Baseline 4 in 232 m2

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE( 1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE( 2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE( 3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE( 4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE( 5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE( 6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE( 7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE( 8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE( 9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA( 1)
R017	Ring 2	not used	2.732E-01	---	FRACA( 2)
R017	Ring 3	not used	0.000E+00	---	FRACA( 3)
R017	Ring 4	not used	0.000E+00	---	FRACA( 4)
R017	Ring 5	not used	0.000E+00	---	FRACA( 5)
R017	Ring 6	not used	0.000E+00	---	FRACA( 6)
R017	Ring 7	not used	0.000E+00	---	FRACA( 7)
R017	Ring 8	not used	0.000E+00	---	FRACA( 8)
R017	Ring 9	not used	0.000E+00	---	FRACA( 9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	not used	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	not used	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	not used	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	not used	-1	---	FPLANT
R018	Contamination fraction of meat	not used	-1	---	FMEAT
R018	Contamination fraction of milk	not used	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	not used	5.000E-01	---	LSI

Summary : Parcel C Baseline 4 in 232 m2

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## Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R019	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	not used	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	not used	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	not used	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	not used	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	not used	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	not used	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	not used	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	not used	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	not used	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
C14	DCF correction factor for gaseous forms of C14	not used	0.000E+00	---	CO2F
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV

Summary : Parcel C Baseline 4 in 232 m2

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## Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	257	---	---	KYMAX

## Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	active
2 -- inhalation (w/o radon)	active
3 -- plant ingestion	suppressed
4 -- meat ingestion	suppressed
5 -- milk ingestion	suppressed
6 -- aquatic foods	suppressed
7 -- drinking water	suppressed
8 -- soil ingestion	active
9 -- radon	suppressed
Find peak pathway doses	suppressed

Summary : Parcel C Baseline 4 in 232 m2

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Contaminated Zone Dimensions

Initial Soil Concentrations, pCi/g

Area:	232.00 square meters	Cs-137	1.130E-01
Thickness:	2.00 meters	Ra-226	1.000E+00
Cover Depth:	0.10 meters	Sr-90	3.310E-01

Total Dose TDOSE(t), mrem/yr

Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	3.037E+00	3.027E+00	3.008E+00	2.943E+00	2.769E+00	2.255E+00	1.282E+00	1.797E-01
M(t):	1.215E-01	1.211E-01	1.203E-01	1.177E-01	1.107E-01	9.021E-02	5.129E-02	7.190E-03

Maximum TDOSE(t): 3.037E+00 mrem/yr at t = 0.000E+00 years

Summary : Parcel C Baseline 4 in 232 m2

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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	7.971E-02	0.0262	9.161E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.463E-05	0.0000
Ra-226	2.952E+00	0.9720	2.298E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.749E-03	0.0012
Sr-90	1.134E-03	0.0004	1.097E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.306E-04	0.0000
===== Total	3.033E+00	0.9986	2.409E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.894E-03	0.0013

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	7.973E-02	0.0263										
Ra-226	0.000E+00	0.0000	2.956E+00	0.9733										
Sr-90	0.000E+00	0.0000	1.275E-03	0.0004										
===== Total	0.000E+00	0.0000	3.037E+00	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 4 in 232 m2

File : Parcel C Total Baseline 4 in 232 m2.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	7.789E-02	0.0257	8.952E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.430E-05	0.0000
Ra-226	2.944E+00	0.9724	2.471E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.311E-03	0.0014
Sr-90	1.101E-03	0.0004	1.066E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.268E-04	0.0000
===== Total	3.023E+00	0.9984	2.578E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.453E-03	0.0015

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	7.790E-02	0.0257										
Ra-226	0.000E+00	0.0000	2.948E+00	0.9739										
Sr-90	0.000E+00	0.0000	1.238E-03	0.0004										
===== Total	0.000E+00	0.0000	3.027E+00	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 4 in 232 m2

File : Parcel C Total Baseline 4 in 232 m2.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	7.436E-02	0.0247	8.547E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.365E-05	0.0000
Ra-226	2.927E+00	0.9730	2.798E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.377E-03	0.0018
Sr-90	1.038E-03	0.0003	1.005E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.196E-04	0.0000
===== Total	3.003E+00	0.9981	2.899E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.510E-03	0.0018

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	7.438E-02	0.0247										
Ra-226	0.000E+00	0.0000	2.933E+00	0.9749										
Sr-90	0.000E+00	0.0000	1.168E-03	0.0004										
===== Total	0.000E+00	0.0000	3.008E+00	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 4 in 232 m2

File : Parcel C Total Baseline 4 in 232 m2.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	6.324E-02	0.0215	7.269E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.161E-05	0.0000
Ra-226	2.870E+00	0.9752	3.767E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.545E-03	0.0029
Sr-90	8.455E-04	0.0003	8.185E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.741E-05	0.0000
===== Total	2.934E+00	0.9969	3.849E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.654E-03	0.0029

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	6.326E-02	0.0215										
Ra-226	0.000E+00	0.0000	2.879E+00	0.9782										
Sr-90	0.000E+00	0.0000	9.511E-04	0.0003										
===== Total	0.000E+00	0.0000	2.943E+00	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 4 in 232 m2

File : Parcel C Total Baseline 4 in 232 m2.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	3.981E-02	0.0144	4.576E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.309E-06	0.0000
Ra-226	2.714E+00	0.9802	5.431E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.406E-02	0.0051
Sr-90	4.704E-04	0.0002	4.553E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.419E-05	0.0000
===== Total	2.754E+00	0.9947	5.477E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.412E-02	0.0051

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	3.982E-02	0.0144										
Ra-226	0.000E+00	0.0000	2.728E+00	0.9854										
Sr-90	0.000E+00	0.0000	5.291E-04	0.0002										
===== Total	0.000E+00	0.0000	2.769E+00	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 4 in 232 m2

File : Parcel C Total Baseline 4 in 232 m2.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	7.880E-03	0.0035	9.056E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.447E-06	0.0000
Ra-226	2.230E+00	0.9888	6.106E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.680E-02	0.0075
Sr-90	6.041E-05	0.0000	5.848E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.960E-06	0.0000
===== Total	2.238E+00	0.9923	6.112E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.681E-02	0.0075

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	7.881E-03	0.0035										
Ra-226	0.000E+00	0.0000	2.247E+00	0.9965										
Sr-90	0.000E+00	0.0000	6.795E-05	0.0000										
===== Total	0.000E+00	0.0000	2.255E+00	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 4 in 232 m2

File : Parcel C Total Baseline 4 in 232 m2.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	7.700E-05	0.0001	8.850E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.414E-08	0.0000
Ra-226	1.272E+00	0.9919	3.614E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.000E-02	0.0078
Sr-90	1.716E-07	0.0000	1.661E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.977E-08	0.0000
===== Total	1.272E+00	0.9919	3.614E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.000E-02	0.0078

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	7.702E-05	0.0001										
Ra-226	0.000E+00	0.0000	1.282E+00	0.9999										
Sr-90	0.000E+00	0.0000	1.930E-07	0.0000										
===== Total	0.000E+00	0.0000	1.282E+00	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 4 in 232 m2

File : Parcel C Total Baseline 4 in 232 m2.rad

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	7.103E-12	0.0000	8.164E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.304E-15	0.0000
Ra-226	1.783E-01	0.9919	5.066E-05	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.402E-03	0.0078
Sr-90	2.095E-16	0.0000	2.028E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.414E-17	0.0000
===== Total	1.783E-01	0.9919	5.066E-05	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.402E-03	0.0078

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	7.104E-12	0.0000										
Ra-226	0.000E+00	0.0000	1.797E-01	1.0000										
Sr-90	0.000E+00	0.0000	2.357E-16	0.0000										
===== Total	0.000E+00	0.0000	1.797E-01	1.0000										

\*Sum of all water independent and dependent pathways.

Summary : Parcel C Baseline 4 in 232 m2

File : Parcel C Total Baseline 4 in 232 m2.rad

Dose/Source Ratios Summed Over All Pathways  
 Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137+D	Cs-137+D	1.000E+00	7.055E-01	6.894E-01	6.582E-01	5.598E-01	3.524E-01	6.974E-02	6.816E-04	6.287E-11
Ra-226+D	Ra-226+D	1.000E+00	2.956E+00	2.947E+00	2.931E+00	2.874E+00	2.717E+00	2.232E+00	1.273E+00	1.785E-01
Ra-226+D	Pb-210+D	1.000E+00	3.083E-04	9.104E-04	2.052E-03	5.457E-03	1.145E-02	1.494E-02	8.964E-03	1.257E-03
Ra-226+D	\$DSR(j)		2.956E+00	2.948E+00	2.933E+00	2.879E+00	2.728E+00	2.247E+00	1.282E+00	1.797E-01
Sr-90+D	Sr-90+D	1.000E+00	3.852E-03	3.741E-03	3.528E-03	2.873E-03	1.599E-03	2.053E-04	5.831E-07	7.120E-16

§ is used to indicate summation; the Greek sigma is not included in this font.  
 The DSR includes contributions from associated (half-life <= 180 days) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g  
 Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Nuclide (i)	t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137		3.543E+01	3.626E+01	3.798E+01	4.466E+01	7.095E+01	3.584E+02	3.668E+04	3.976E+11
Ra-226		8.458E+00	8.480E+00	8.524E+00	8.683E+00	9.163E+00	1.112E+01	1.950E+01	1.391E+02
Sr-90		6.490E+03	6.683E+03	7.086E+03	8.701E+03	1.564E+04	1.218E+05	4.287E+07	*1.365E+14

\*At specific activity limit

Summed Dose/Source Ratios DSR(i,t) in (mrem/yr)/(pCi/g)  
 and Single Radionuclide Soil Guidelines G(i,t) in pCi/g  
 at tmin = time of minimum single radionuclide soil guideline  
 and at tmax = time of maximum total dose = 0.000E+00 years

Nuclide (i)	Initial (pCi/g)	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Cs-137	1.130E-01	0.000E+00	7.055E-01	3.543E+01	7.055E-01	3.543E+01
Ra-226	1.000E+00	0.000E+00	2.956E+00	8.458E+00	2.956E+00	8.458E+00
Sr-90	3.310E-01	0.000E+00	3.852E-03	6.490E+03	3.852E-03	6.490E+03

Summary : Parcel C Baseline 4 in 232 m2

File : Parcel C Total Baseline 4 in 232 m2.rad

Individual Nuclide Dose Summed Over All Pathways  
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	DOSE(j,t), mrem/yr							
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137	Cs-137	1.000E+00	7.973E-02	7.790E-02	7.438E-02	6.326E-02	3.982E-02	7.881E-03	7.702E-05	7.104E-12
Ra-226	Ra-226	1.000E+00	2.956E+00	2.947E+00	2.931E+00	2.874E+00	2.717E+00	2.232E+00	1.273E+00	1.785E-01
Pb-210	Ra-226	1.000E+00	3.083E-04	9.104E-04	2.052E-03	5.457E-03	1.145E-02	1.494E-02	8.964E-03	1.257E-03
Sr-90	Sr-90	1.000E+00	1.275E-03	1.238E-03	1.168E-03	9.511E-04	5.291E-04	6.795E-05	1.930E-07	2.357E-16
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

THF(i) is the thread fraction of the parent nuclide.

§ is used to indicate summation; the Greek sigma is not included in this font.

Individual Nuclide Soil Concentration  
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g							
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137	Cs-137	1.000E+00	1.130E-01	1.104E-01	1.054E-01	8.966E-02	5.644E-02	1.117E-02	1.092E-04	1.007E-11
Ra-226	Ra-226	1.000E+00	1.000E+00	9.972E-01	9.916E-01	9.723E-01	9.192E-01	7.553E-01	4.308E-01	6.039E-02
Pb-210	Ra-226	1.000E+00	0.000E+00	3.054E-02	8.844E-02	2.612E-01	5.656E-01	7.448E-01	4.472E-01	6.270E-02
Sr-90	Sr-90	1.000E+00	3.310E-01	3.214E-01	3.031E-01	2.469E-01	1.374E-01	1.764E-02	5.010E-05	6.118E-14
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

THF(i) is the thread fraction of the parent nuclide.

§ is used to indicate summation; the Greek sigma is not included in this font.

RESCALC.EXE execution time = 1.61 seconds

Intrisk : Parcel C Baseline 4 in 232 m2

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Cancer Risk Slope Factors Summary Table

Risk Library: FGR 13 Morbidity

Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-1	Ground external radiation slope factors, 1/yr per (pCi/g):			
Sf-1	Cs-137+D	2.55E-06	5.32E-10	SLPF( 1,1)
Sf-1	Pb-210+D	4.21E-09	1.41E-09	SLPF( 2,1)
Sf-1	Ra-226+D	8.49E-06	2.29E-08	SLPF( 3,1)
Sf-1	Sr-90+D	1.96E-08	4.82E-10	SLPF( 4,1)
Sf-2	Inhalation, slope factors, 1/(pCi):			
Sf-2	Cs-137+D	1.12E-10	1.12E-10	SLPF( 1,2)
Sf-2	Pb-210+D	3.08E-08	1.58E-08	SLPF( 2,2)
Sf-2	Ra-226+D	2.83E-08	2.82E-08	SLPF( 3,2)
Sf-2	Sr-90+D	4.33E-10	4.25E-10	SLPF( 4,2)
Sf-3	Food ingestion, slope factors, 1/(pCi):			
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF( 1,3)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF( 2,3)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF( 3,3)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF( 4,3)
Sf-3	Water ingestion, slope factors, 1/(pCi):			
Sf-3	Cs-137+D	3.04E-11	3.04E-11	SLPF( 1,4)
Sf-3	Pb-210+D	2.66E-09	8.81E-10	SLPF( 2,4)
Sf-3	Ra-226+D	3.86E-10	3.85E-10	SLPF( 3,4)
Sf-3	Sr-90+D	7.40E-11	5.59E-11	SLPF( 4,4)
Sf-3	Soil ingestion, slope factors, 1/(pCi):			
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF( 1,5)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF( 2,5)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF( 3,5)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF( 4,5)
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	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)

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

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Risk Slope and Environmental Transport Factors for the Ground Pathway

Nuclide (i)	Slope(i)* t=	ETFG(i,t) At Time in Years (dimensionless)							
		0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
At-218	3.570E-09	2.735E-03	2.735E-03	2.735E-03	2.735E-03	2.735E-03	2.735E-03	2.735E-03	2.735E-03
Ba-137m	2.690E-06	2.092E-01	2.092E-01	2.092E-01	2.092E-01	2.092E-01	2.092E-01	2.092E-01	2.092E-01
Bi-210	2.760E-09	1.097E-01	1.097E-01	1.097E-01	1.097E-01	1.097E-01	1.097E-01	1.097E-01	1.097E-01
Bi-214	7.480E-06	2.788E-01	2.788E-01	2.788E-01	2.788E-01	2.788E-01	2.788E-01	2.788E-01	2.788E-01
Cs-137	5.320E-10	7.432E-02	7.432E-02	7.432E-02	7.432E-02	7.432E-02	7.432E-02	7.432E-02	7.432E-02
Pb-210	1.410E-09	4.208E-04	4.208E-04	4.208E-04	4.208E-04	4.208E-04	4.208E-04	4.208E-04	4.208E-04
Pb-214	9.820E-07	1.626E-01	1.626E-01	1.626E-01	1.626E-01	1.626E-01	1.626E-01	1.626E-01	1.626E-01
Po-210	3.950E-11	2.248E-01	2.248E-01	2.248E-01	2.248E-01	2.248E-01	2.248E-01	2.248E-01	2.248E-01
Po-214	3.860E-10	2.298E-01	2.298E-01	2.298E-01	2.298E-01	2.298E-01	2.298E-01	2.298E-01	2.298E-01
Po-218	4.260E-11	2.295E-01	2.295E-01	2.295E-01	2.295E-01	2.295E-01	2.295E-01	2.295E-01	2.295E-01
Ra-226	2.290E-08	1.142E-01	1.142E-01	1.142E-01	1.142E-01	1.142E-01	1.142E-01	1.142E-01	1.142E-01
Rn-222	1.740E-09	1.985E-01	1.985E-01	1.985E-01	1.985E-01	1.985E-01	1.985E-01	1.985E-01	1.985E-01
Sr-90	4.820E-10	6.096E-02	6.096E-02	6.096E-02	6.096E-02	6.096E-02	6.096E-02	6.096E-02	6.096E-02
Tl-210	0.000E+00	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01
Y-90	1.910E-08	1.435E-01	1.435E-01	1.435E-01	1.435E-01	1.435E-01	1.435E-01	1.435E-01	1.435E-01
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* - Units are 1/yr per (pCi/g) at infinite depth and area. Multiplication by ETEG(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	
Cs-137	2.905E-03	0.000E+00	0.000E+00	0.000E+00	2.961E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.961E-01
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	2.571E-02	0.000E+00	0.000E+00	0.000E+00	2.620E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.620E+00
Sr-90	8.510E-03	0.000E+00	0.000E+00	0.000E+00	8.673E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.673E-01

\* 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

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= 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.
Cs-137	1.108E-06	0.0207	5.992E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.039E-10	0.0000
Pb-210	2.135E-09	0.0000	5.408E-09	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.170E-08	0.0012
Ra-226	5.217E-05	0.9767	1.687E-08	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.131E-08	0.0006
Sr-90	1.580E-08	0.0003	6.356E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.424E-09	0.0000
Total	5.330E-05	0.9978	2.235E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.464E-08	0.0018

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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 Dependent Pathways

Radio- Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Cs-137	0.000E+00	0.0000	1.108E-06	0.0207								
Pb-210	0.000E+00	0.0000	6.925E-08	0.0013								
Ra-226	0.000E+00	0.0000	5.222E-05	0.9776								
Sr-90	0.000E+00	0.0000	1.729E-08	0.0003								
===== Total	0.000E+00	0.0000	5.341E-05	1.0000								

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

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 CNRSI(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.
Cs-137	1.108E-06	0.0207	5.992E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.039E-10	0.0000
Ra-226	5.217E-05	0.9768	2.228E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.301E-08	0.0017
Sr-90	1.580E-08	0.0003	6.356E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.424E-09	0.0000
===== Total	5.330E-05	0.9978	2.235E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.464E-08	0.0018

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Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	1.108E-06	0.0207										
Ra-226	0.000E+00	0.0000	5.229E-05	0.9789										
Sr-90	0.000E+00	0.0000	1.729E-08	0.0003										
===== Total	0.000E+00	0.0000	5.341E-05	1.0000										

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

Intrisk : Parcel C Baseline 4 in 232 m2

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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	
Cs-137	2.839E-03	0.000E+00	0.000E+00	0.000E+00	2.893E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.893E-01
Pb-210	7.851E-04	0.000E+00	0.000E+00	0.000E+00	8.001E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.001E-02
Ra-226	2.564E-02	0.000E+00	0.000E+00	0.000E+00	2.613E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.613E+00
Sr-90	8.264E-03	0.000E+00	0.000E+00	0.000E+00	8.423E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.423E-01
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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= 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

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.
Cs-137	1.083E-06	0.0203	5.855E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.993E-10	0.0000
Pb-210	2.287E-09	0.0000	5.794E-09	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.611E-08	0.0012
Ra-226	5.202E-05	0.9771	1.682E-08	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.122E-08	0.0006
Sr-90	1.535E-08	0.0003	6.172E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.383E-09	0.0000
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	5.312E-05	0.9977	2.268E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.891E-08	0.0019

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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

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Cs-137	0.000E+00	0.0000	1.083E-06	0.0203								
Pb-210	0.000E+00	0.0000	7.419E-08	0.0014								
Ra-226	0.000E+00	0.0000	5.207E-05	0.9780								
Sr-90	0.000E+00	0.0000	1.679E-08	0.0003								
===== Total	0.000E+00	0.0000	5.325E-05	1.0000								

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

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

Total Excess Cancer Risk CNRSI(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.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Cs-137	1.083E-06	0.0203	5.855E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.993E-10	0.0000
Ra-226	5.203E-05	0.9771	2.262E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.733E-08	0.0018
Sr-90	1.535E-08	0.0003	6.172E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.383E-09	0.0000
===== Total	5.312E-05	0.9977	2.268E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.891E-08	0.0019

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Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	1.083E-06	0.0203										
Ra-226	0.000E+00	0.0000	5.215E-05	0.9793										
Sr-90	0.000E+00	0.0000	1.679E-08	0.0003										
===== Total	0.000E+00	0.0000	5.325E-05	1.0000										

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

Intrisk : Parcel C Baseline 4 in 232 m2

File : Parcel C Total Baseline 4 in 232 m2.rad

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	
Cs-137	2.710E-03	0.000E+00	0.000E+00	0.000E+00	2.762E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.762E-01
Pb-210	2.274E-03	0.000E+00	0.000E+00	0.000E+00	2.317E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.317E-01
Ra-226	2.549E-02	0.000E+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	2.598E+00
Sr-90	7.794E-03	0.000E+00	0.000E+00	0.000E+00	7.943E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.943E-01
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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

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.
Cs-137	1.034E-06	0.0195	5.590E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.903E-10	0.0000
Pb-210	2.576E-09	0.0000	6.525E-09	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.445E-08	0.0014
Ra-226	5.173E-05	0.9777	1.673E-08	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.104E-08	0.0006
Sr-90	1.447E-08	0.0003	5.821E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.304E-09	0.0000
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	5.278E-05	0.9975	2.332E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.070E-07	0.0020

Intrisk : Parcel C Baseline 4 in 232 m2

File : Parcel C Total Baseline 4 in 232 m2.rad

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.								
Cs-137	0.000E+00	0.0000	1.034E-06	0.0195								
Pb-210	0.000E+00	0.0000	8.355E-08	0.0016								
Ra-226	0.000E+00	0.0000	5.178E-05	0.9786								
Sr-90	0.000E+00	0.0000	1.584E-08	0.0003								
===== Total	0.000E+00	0.0000	5.291E-05	1.0000								

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

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 CNRSI(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.
Cs-137	1.034E-06	0.0195	5.590E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.903E-10	0.0000
Ra-226	5.174E-05	0.9777	2.325E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.055E-07	0.0020
Sr-90	1.447E-08	0.0003	5.821E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.304E-09	0.0000
===== Total	5.278E-05	0.9975	2.332E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.070E-07	0.0020

Intrisk : Parcel C Baseline 4 in 232 m2

File : Parcel C Total Baseline 4 in 232 m2.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	1.034E-06	0.0195										
Ra-226	0.000E+00	0.0000	5.186E-05	0.9802										
Sr-90	0.000E+00	0.0000	1.584E-08	0.0003										
===== Total	0.000E+00	0.0000	5.291E-05	1.0000										

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

Intrisk : Parcel C Baseline 4 in 232 m2

File : Parcel C Total Baseline 4 in 232 m2.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	
Cs-137	2.305E-03	0.000E+00	0.000E+00	0.000E+00	2.349E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.349E-01
Pb-210	6.715E-03	0.000E+00	0.000E+00	0.000E+00	6.844E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.844E-01
Ra-226	2.500E-02	0.000E+00	0.000E+00	0.000E+00	2.548E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.548E+00
Sr-90	6.347E-03	0.000E+00	0.000E+00	0.000E+00	6.469E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.469E-01

\* 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= 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

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.
Cs-137	8.791E-07	0.0170	4.754E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.618E-10	0.0000
Pb-210	3.431E-09	0.0001	8.691E-09	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.916E-08	0.0019
Ra-226	5.073E-05	0.9797	1.640E-08	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.044E-08	0.0006
Sr-90	1.179E-08	0.0002	4.741E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.062E-09	0.0000
Total	5.162E-05	0.9970	2.515E-08	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.308E-07	0.0025

Intrisk : Parcel C Baseline 4 in 232 m2

File : Parcel C Total Baseline 4 in 232 m2.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

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Cs-137	0.000E+00	0.0000	8.792E-07	0.0170								
Pb-210	0.000E+00	0.0000	1.113E-07	0.0021								
Ra-226	0.000E+00	0.0000	5.077E-05	0.9806								
Sr-90	0.000E+00	0.0000	1.290E-08	0.0002								
===== Total	0.000E+00	0.0000	5.178E-05	1.0000								

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

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 CNRSI(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.
Cs-137	8.791E-07	0.0170	4.754E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.618E-10	0.0000
Ra-226	5.073E-05	0.9798	2.509E-08	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.296E-07	0.0025
Sr-90	1.179E-08	0.0002	4.741E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.062E-09	0.0000
===== Total	5.162E-05	0.9970	2.515E-08	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.308E-07	0.0025

Intrisk : Parcel C Baseline 4 in 232 m2

File : Parcel C Total Baseline 4 in 232 m2.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	8.792E-07	0.0170										
Ra-226	0.000E+00	0.0000	5.089E-05	0.9828										
Sr-90	0.000E+00	0.0000	1.290E-08	0.0002										
===== Total	0.000E+00	0.0000	5.178E-05	1.0000										

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

Intrisk : Parcel C Baseline 4 in 232 m2

File : Parcel C Total Baseline 4 in 232 m2.rad

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As pCi/yr at t= 3.000E+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	
Cs-137	1.451E-03	0.000E+00	0.000E+00	0.000E+00	1.479E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.479E-01
Pb-210	1.454E-02	0.000E+00	0.000E+00	0.000E+00	1.482E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.482E+00
Ra-226	2.363E-02	0.000E+00	0.000E+00	0.000E+00	2.409E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.409E+00
Sr-90	3.531E-03	0.000E+00	0.000E+00	0.000E+00	3.599E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.599E-01

\* 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+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

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p) and Fraction of Total Risk at t= 3.000E+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.
Cs-137	5.534E-07	0.0114	2.993E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.019E-10	0.0000
Pb-210	4.897E-09	0.0001	1.241E-08	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.415E-07	0.0029
Ra-226	4.796E-05	0.9843	1.551E-08	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.878E-08	0.0006
Sr-90	6.558E-09	0.0001	2.637E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.910E-10	0.0000
Total	4.852E-05	0.9959	2.794E-08	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.710E-07	0.0035

Intrisk : Parcel C Baseline 4 in 232 m2

File : Parcel C Total Baseline 4 in 232 m2.rad

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Cs-137	0.000E+00	0.0000	5.535E-07	0.0114								
Pb-210	0.000E+00	0.0000	1.588E-07	0.0033								
Ra-226	0.000E+00	0.0000	4.800E-05	0.9852								
Sr-90	0.000E+00	0.0000	7.176E-09	0.0001								
===== Total	0.000E+00	0.0000	4.872E-05	1.0000								

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

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of  
Radon and its Decay Products at t= 3.000E+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 CNRSI(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 3.000E+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.
Cs-137	5.534E-07	0.0114	2.993E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.019E-10	0.0000
Ra-226	4.796E-05	0.9844	2.791E-08	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.703E-07	0.0035
Sr-90	6.558E-09	0.0001	2.637E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.910E-10	0.0000
===== Total	4.852E-05	0.9959	2.794E-08	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.710E-07	0.0035

Intrisk : Parcel C Baseline 4 in 232 m2

File : Parcel C Total Baseline 4 in 232 m2.rad

Total Excess Cancer Risk CNRSI(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.										
Cs-137	0.000E+00	0.0000	5.535E-07	0.0114										
Ra-226	0.000E+00	0.0000	4.816E-05	0.9885										
Sr-90	0.000E+00	0.0000	7.176E-09	0.0001										
===== Total	0.000E+00	0.0000	4.872E-05	1.0000										

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

Intrisk : Parcel C Baseline 4 in 232 m2

File : Parcel C Total Baseline 4 in 232 m2.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	
Cs-137	2.872E-04	0.000E+00	0.000E+00	0.000E+00	2.927E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.927E-02
Pb-210	1.915E-02	0.000E+00	0.000E+00	0.000E+00	1.952E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.952E+00
Ra-226	1.942E-02	0.000E+00	0.000E+00	0.000E+00	1.979E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.979E+00
Sr-90	4.535E-04	0.000E+00	0.000E+00	0.000E+00	4.622E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.622E-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= 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

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.
Cs-137	1.095E-07	0.0028	5.923E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.016E-11	0.0000
Pb-210	5.477E-09	0.0001	1.387E-08	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.583E-07	0.0040
Ra-226	3.940E-05	0.9918	1.274E-08	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.364E-08	0.0006
Sr-90	8.423E-10	0.0000	3.387E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.591E-11	0.0000
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	3.952E-05	0.9947	2.662E-08	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.820E-07	0.0046

Intrisk : Parcel C Baseline 4 in 232 m2

File : Parcel C Total Baseline 4 in 232 m2.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

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Cs-137	0.000E+00	0.0000	1.095E-07	0.0028								
Pb-210	0.000E+00	0.0000	1.776E-07	0.0045								
Ra-226	0.000E+00	0.0000	3.944E-05	0.9927								
Sr-90	0.000E+00	0.0000	9.216E-10	0.0000								
===== Total	0.000E+00	0.0000	3.973E-05	1.0000								

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

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 CNRSI(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 1.000E+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.
Cs-137	1.095E-07	0.0028	5.923E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.016E-11	0.0000
Ra-226	3.941E-05	0.9920	2.662E-08	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.819E-07	0.0046
Sr-90	8.423E-10	0.0000	3.387E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.591E-11	0.0000
===== Total	3.952E-05	0.9947	2.662E-08	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.820E-07	0.0046

Intrisk : Parcel C Baseline 4 in 232 m2

File : Parcel C Total Baseline 4 in 232 m2.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	1.095E-07	0.0028										
Ra-226	0.000E+00	0.0000	3.962E-05	0.9972										
Sr-90	0.000E+00	0.0000	9.216E-10	0.0000										
===== Total	0.000E+00	0.0000	3.973E-05	1.0000										

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

Intrisk : Parcel C Baseline 4 in 232 m2

File : Parcel C Total Baseline 4 in 232 m2.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	
Cs-137	2.806E-06	0.000E+00	0.000E+00	0.000E+00	2.860E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.860E-04
Pb-210	1.150E-02	0.000E+00	0.000E+00	0.000E+00	1.172E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.172E+00
Ra-226	1.108E-02	0.000E+00	0.000E+00	0.000E+00	1.129E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.129E+00
Sr-90	1.288E-06	0.000E+00	0.000E+00	0.000E+00	1.313E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.313E-04
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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+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

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)

Radio-Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Cs-137	1.070E-09	0.0000	5.788E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.970E-13	0.0000
Pb-210	3.240E-09	0.0001	8.208E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.365E-08	0.0041
Ra-226	2.248E-05	0.9944	7.268E-09	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.349E-08	0.0006
Sr-90	2.392E-12	0.0000	9.620E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.156E-13	0.0000
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	2.248E-05	0.9946	1.548E-08	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.071E-07	0.0047

Intrisk : Parcel C Baseline 4 in 232 m2

File : Parcel C Total Baseline 4 in 232 m2.rad

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.								
Cs-137	0.000E+00	0.0000	1.071E-09	0.0000								
Pb-210	0.000E+00	0.0000	1.051E-07	0.0046								
Ra-226	0.000E+00	0.0000	2.250E-05	0.9953								
Sr-90	0.000E+00	0.0000	2.618E-12	0.0000								
===== Total	0.000E+00	0.0000	2.260E-05	1.0000								

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

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 CNRSI(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 3.000E+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.
Cs-137	1.070E-09	0.0000	5.788E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.970E-13	0.0000
Ra-226	2.248E-05	0.9945	1.548E-08	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.071E-07	0.0047
Sr-90	2.392E-12	0.0000	9.620E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.156E-13	0.0000
===== Total	2.248E-05	0.9946	1.548E-08	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.071E-07	0.0047

Intrisk : Parcel C Baseline 4 in 232 m2

File : Parcel C Total Baseline 4 in 232 m2.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	1.071E-09	0.0000										
Ra-226	0.000E+00	0.0000	2.260E-05	1.0000										
Sr-90	0.000E+00	0.0000	2.618E-12	0.0000										
===== Total	0.000E+00	0.0000	2.260E-05	1.0000										

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

Intrisk : Parcel C Baseline 4 in 232 m2

File : Parcel C Total Baseline 4 in 232 m2.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	
Cs-137	2.589E-13	0.000E+00	0.000E+00	0.000E+00	2.639E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.639E-11
Pb-210	1.612E-03	0.000E+00	0.000E+00	0.000E+00	1.643E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.643E-01
Ra-226	1.553E-03	0.000E+00	0.000E+00	0.000E+00	1.582E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.582E-01
Sr-90	1.573E-15	0.000E+00	0.000E+00	0.000E+00	1.603E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.603E-13
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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= 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.
Cs-137	9.873E-17	0.0000	5.340E-22	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.817E-20	0.0000
Pb-210	4.542E-10	0.0001	1.151E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.313E-08	0.0041
Ra-226	3.151E-06	0.9944	1.019E-09	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.891E-09	0.0006
Sr-90	2.921E-21	0.0000	1.175E-23	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.633E-22	0.0000
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	3.151E-06	0.9946	2.169E-09	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.502E-08	0.0047

Intrisk : Parcel C Baseline 4 in 232 m2

File : Parcel C Total Baseline 4 in 232 m2.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 Dependent Pathways

Radio- Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Cs-137	0.000E+00	0.0000	9.875E-17	0.0000								
Pb-210	0.000E+00	0.0000	1.473E-08	0.0047								
Ra-226	0.000E+00	0.0000	3.154E-06	0.9953								
Sr-90	0.000E+00	0.0000	3.196E-21	0.0000								
===== Total	0.000E+00	0.0000	3.168E-06	1.0000								

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

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 CNRSI(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	fract.
Cs-137	9.873E-17	0.0000	5.340E-22	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.817E-20	0.0000
Ra-226	3.151E-06	0.9946	2.169E-09	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.502E-08	0.0047
Sr-90	2.921E-21	0.0000	1.175E-23	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.633E-22	0.0000
===== Total	3.151E-06	0.9946	2.169E-09	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.502E-08	0.0047

Intrisk : Parcel C Baseline 4 in 232 m2

File : Parcel C Total Baseline 4 in 232 m2.rad

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	9.875E-17	0.0000										
Ra-226	0.000E+00	0.0000	3.168E-06	1.0000										
Sr-90	0.000E+00	0.0000	3.196E-21	0.0000										
===== Total	0.000E+00	0.0000	3.168E-06	1.0000										

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

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Dose Conversion Factor (and Related) Parameter Summary  
 File: FGR 13 MORBIDITY

Menu	Parameter	Current Value	Base Case*	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2( 1)
B-1	Pb-210+D	2.320E-02	1.360E-02	DCF2( 2)
B-1	Ra-226+D	8.594E-03	8.580E-03	DCF2( 3)
B-1	Sr-90+D	1.308E-03	1.300E-03	DCF2( 4)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3( 1)
D-1	Pb-210+D	7.276E-03	5.370E-03	DCF3( 2)
D-1	Ra-226+D	1.321E-03	1.320E-03	DCF3( 3)
D-1	Sr-90+D	1.528E-04	1.420E-04	DCF3( 4)
D-34	Food transfer factors:			
D-34	Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF( 1,1)
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF( 1,2)
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF( 1,3)
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF( 2,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF( 2,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF( 2,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF( 3,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF( 3,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF( 3,3)
D-34				
D-34	Sr-90+D , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF( 4,1)
D-34	Sr-90+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-03	8.000E-03	RTF( 4,2)
D-34	Sr-90+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF( 4,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC( 1,1)
D-5	Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC( 1,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC( 2,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC( 2,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC( 3,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC( 3,2)
D-5				
D-5	Sr-90+D , fish	6.000E+01	6.000E+01	BIOFAC( 4,1)
D-5	Sr-90+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC( 4,2)

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

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.000E+04	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	2.000E+00	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	not used	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T( 2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T( 3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T( 4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T( 5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T( 6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T( 7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T( 8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T( 9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Cs-137	1.130E-01	0.000E+00	---	SI( 1)
R012	Initial principal radionuclide (pCi/g): Ra-226	1.000E+00	0.000E+00	---	SI( 3)
R012	Initial principal radionuclide (pCi/g): Sr-90	3.310E-01	0.000E+00	---	SI( 4)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	WI( 1)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	WI( 3)
R012	Concentration in groundwater (pCi/L): Sr-90	not used	0.000E+00	---	WI( 4)
R013	Cover depth (m)	1.016E-01	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	1.500E+00	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	0.000E+00	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	2.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.000E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	not used	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	not used	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	not used	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	not used	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	not used	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	not used	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	not used	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	not used	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	not used	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	not used	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	not used	ND	---	MODEL

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R014	Well pumping rate (m**3/yr)	not used	2.500E+02	---	UW
R015	Number of unsaturated zone strata	not used	1	---	NS
R015	Unsat. zone 1, thickness (m)	not used	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	not used	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	not used	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	not used	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	not used	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	not used	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	not used	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	4.600E+03	4.600E+03	---	DCNUCC( 1)
R016	Unsat. zone 1 (cm**3/g)	not used	4.600E+03	---	DCNUCU( 1,1)
R016	Saturated zone (cm**3/g)	not used	4.600E+03	---	DCNUCS( 1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.623E-05	ALEACH( 1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 1)
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC( 3)
R016	Unsat. zone 1 (cm**3/g)	not used	7.000E+01	---	DCNUCU( 3,1)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS( 3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.374E-03	ALEACH( 3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 3)
R016	Distribution coefficients for Sr-90				
R016	Contaminated zone (cm**3/g)	3.000E+01	3.000E+01	---	DCNUCC( 4)
R016	Unsat. zone 1 (cm**3/g)	not used	3.000E+01	---	DCNUCU( 4,1)
R016	Saturated zone (cm**3/g)	not used	3.000E+01	---	DCNUCS( 4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.516E-03	ALEACH( 4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 4)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC( 2)
R016	Unsat. zone 1 (cm**3/g)	not used	1.000E+02	---	DCNUCU( 2,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS( 2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.663E-03	ALEACH( 2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 2)
R017	Inhalation rate (m**3/yr)	7.270E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	2.400E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	9.590E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE( 1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE( 2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE( 3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE( 4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE( 5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE( 6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE( 7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE( 8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE( 9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA( 1)
R017	Ring 2	not used	2.732E-01	---	FRACA( 2)
R017	Ring 3	not used	0.000E+00	---	FRACA( 3)
R017	Ring 4	not used	0.000E+00	---	FRACA( 4)
R017	Ring 5	not used	0.000E+00	---	FRACA( 5)
R017	Ring 6	not used	0.000E+00	---	FRACA( 6)
R017	Ring 7	not used	0.000E+00	---	FRACA( 7)
R017	Ring 8	not used	0.000E+00	---	FRACA( 8)
R017	Ring 9	not used	0.000E+00	---	FRACA( 9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	not used	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	not used	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	not used	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	not used	-1	---	FPLANT
R018	Contamination fraction of meat	not used	-1	---	FMEAT
R018	Contamination fraction of milk	not used	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	not used	5.000E-01	---	LSI
R019	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	---	MLFD

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	not used	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	not used	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	not used	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	not used	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	not used	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	not used	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	not used	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	not used	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	not used	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
C14	DCF correction factor for gaseous forms of C14	not used	0.000E+00	---	CO2F
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA (1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA (2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	257	---	---	KYMAX

Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	active
2 -- inhalation (w/o radon)	active
3 -- plant ingestion	suppressed
4 -- meat ingestion	suppressed
5 -- milk ingestion	suppressed
6 -- aquatic foods	suppressed
7 -- drinking water	suppressed
8 -- soil ingestion	active
9 -- radon	suppressed
Find peak pathway doses	suppressed

Contaminated Zone Dimensions

Initial Soil Concentrations, pCi/g

Area:	10000.00 square meters	Cs-137	1.130E-01
Thickness:	2.00 meters	Ra-226	1.000E+00
Cover Depth:	0.10 meters	Sr-90	3.310E-01

Total Dose TDOSE(t), mrem/yr

Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	3.054E+00	3.046E+00	3.031E+00	2.976E+00	2.820E+00	2.314E+00	1.317E+00	1.847E-01
M(t):	1.222E-01	1.219E-01	1.212E-01	1.191E-01	1.128E-01	9.257E-02	5.270E-02	7.387E-03

Maximum TDOSE(t): 3.054E+00 mrem/yr at t = 0.000E+00 years

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	7.971E-02	0.0261	1.357E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.308E-05	0.0000
Ra-226	2.956E+00	0.9679	3.404E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.616E-02	0.0053
Sr-90	1.137E-03	0.0004	1.626E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.629E-04	0.0002
===== Total	3.037E+00	0.9944	3.568E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.679E-02	0.0055

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	7.977E-02	0.0261										
Ra-226	0.000E+00	0.0000	2.973E+00	0.9733										
Sr-90	0.000E+00	0.0000	1.716E-03	0.0006										
===== Total	0.000E+00	0.0000	3.054E+00	1.0000										

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	7.789E-02	0.0256	1.326E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.164E-05	0.0000
Ra-226	2.948E+00	0.9676	3.660E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.858E-02	0.0061
Sr-90	1.104E-03	0.0004	1.579E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.467E-04	0.0002
===== Total	3.027E+00	0.9936	3.819E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.919E-02	0.0063

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	7.795E-02	0.0256										
Ra-226	0.000E+00	0.0000	2.967E+00	0.9739										
Sr-90	0.000E+00	0.0000	1.667E-03	0.0005										
===== Total	0.000E+00	0.0000	3.046E+00	1.0000										

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	7.436E-02	0.0245	1.266E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.885E-05	0.0000
Ra-226	2.931E+00	0.9671	4.144E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.317E-02	0.0076
Sr-90	1.042E-03	0.0003	1.489E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.155E-04	0.0002
===== Total	3.007E+00	0.9920	4.295E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.375E-02	0.0078

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	7.442E-02	0.0246										
Ra-226	0.000E+00	0.0000	2.955E+00	0.9749										
Sr-90	0.000E+00	0.0000	1.572E-03	0.0005										
===== Total	0.000E+00	0.0000	3.031E+00	1.0000										

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	6.324E-02	0.0212	1.077E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.005E-05	0.0000
Ra-226	2.874E+00	0.9657	5.580E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.683E-02	0.0124
Sr-90	8.483E-04	0.0003	1.212E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.199E-04	0.0001
===== Total	2.938E+00	0.9873	5.702E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.730E-02	0.0125

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	6.329E-02	0.0213										
Ra-226	0.000E+00	0.0000	2.912E+00	0.9783										
Sr-90	0.000E+00	0.0000	1.280E-03	0.0004										
===== Total	0.000E+00	0.0000	2.976E+00	1.0000										

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	3.981E-02	0.0141	6.778E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.151E-05	0.0000
Ra-226	2.718E+00	0.9638	8.045E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.059E-02	0.0215
Sr-90	4.719E-04	0.0002	6.745E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.336E-04	0.0001
===== Total	2.758E+00	0.9781	8.114E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.085E-02	0.0216

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	3.984E-02	0.0141										
Ra-226	0.000E+00	0.0000	2.779E+00	0.9856										
Sr-90	0.000E+00	0.0000	7.123E-04	0.0003										
===== Total	0.000E+00	0.0000	2.820E+00	1.0000										

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	7.880E-03	0.0034	1.342E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.236E-06	0.0000
Ra-226	2.233E+00	0.9649	9.045E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.243E-02	0.0313
Sr-90	6.061E-05	0.0000	8.663E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.000E-05	0.0000
===== Total	2.241E+00	0.9683	9.054E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.246E-02	0.0313

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	7.886E-03	0.0034										
Ra-226	0.000E+00	0.0000	2.306E+00	0.9966										
Sr-90	0.000E+00	0.0000	9.148E-05	0.0000										
===== Total	0.000E+00	0.0000	2.314E+00	1.0000										

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	7.700E-05	0.0001	1.311E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.094E-08	0.0000
Ra-226	1.274E+00	0.9668	5.354E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.312E-02	0.0327
Sr-90	1.721E-07	0.0000	2.461E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.521E-08	0.0000
===== Total	1.274E+00	0.9669	5.354E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.312E-02	0.0327

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	7.706E-05	0.0001										
Ra-226	0.000E+00	0.0000	1.317E+00	0.9999										
Sr-90	0.000E+00	0.0000	2.598E-07	0.0000										
===== Total	0.000E+00	0.0000	1.317E+00	1.0000										

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	7.103E-12	0.0000	1.209E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.621E-15	0.0000
Ra-226	1.785E-01	0.9669	7.505E-05	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.045E-03	0.0327
Sr-90	2.102E-16	0.0000	3.004E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.040E-16	0.0000
===== Total	1.785E-01	0.9669	7.505E-05	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.045E-03	0.0327

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	7.109E-12	0.0000										
Ra-226	0.000E+00	0.0000	1.847E-01	1.0000										
Sr-90	0.000E+00	0.0000	3.173E-16	0.0000										
===== Total	0.000E+00	0.0000	1.847E-01	1.0000										

\*Sum of all water independent and dependent pathways.

Dose/Source Ratios Summed Over All Pathways  
 Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137+D	Cs-137+D	1.000E+00	7.060E-01	6.898E-01	6.586E-01	5.601E-01	3.526E-01	6.979E-02	6.820E-04	6.291E-11
Ra-226+D	Ra-226+D	1.000E+00	2.971E+00	2.963E+00	2.946E+00	2.889E+00	2.731E+00	2.244E+00	1.280E+00	1.794E-01
Ra-226+D	Pb-210+D	1.000E+00	1.282E-03	3.786E-03	8.534E-03	2.270E-02	4.763E-02	6.214E-02	3.728E-02	5.226E-03
Ra-226+D	§DSR(j)		2.973E+00	2.967E+00	2.955E+00	2.912E+00	2.779E+00	2.306E+00	1.317E+00	1.847E-01
Sr-90+D	Sr-90+D	1.000E+00	5.186E-03	5.036E-03	4.749E-03	3.868E-03	2.152E-03	2.764E-04	7.850E-07	9.585E-16

§ is used to indicate summation; the Greek sigma is not included in this font.  
 The DSR includes contributions from associated (half-life <= 180 days) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g  
 Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Nuclide (i)	t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137		3.541E+01	3.624E+01	3.796E+01	4.463E+01	7.090E+01	3.582E+02	3.666E+04	3.974E+11
Ra-226		8.410E+00	8.427E+00	8.460E+00	8.586E+00	8.996E+00	1.084E+01	1.898E+01	1.354E+02
Sr-90		4.821E+03	4.964E+03	5.264E+03	6.463E+03	1.162E+04	9.046E+04	3.185E+07	*1.365E+14

\*At specific activity limit

Summed Dose/Source Ratios DSR(i,t) in (mrem/yr)/(pCi/g)  
 and Single Radionuclide Soil Guidelines G(i,t) in pCi/g  
 at tmin = time of minimum single radionuclide soil guideline  
 and at tmax = time of maximum total dose = 0.000E+00 years

Nuclide (i)	Initial (pCi/g)	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Cs-137	1.130E-01	0.000E+00	7.060E-01	3.541E+01	7.060E-01	3.541E+01
Ra-226	1.000E+00	0.000E+00	2.973E+00	8.410E+00	2.973E+00	8.410E+00
Sr-90	3.310E-01	0.000E+00	5.186E-03	4.821E+03	5.186E-03	4.821E+03

Individual Nuclide Dose Summed Over All Pathways  
 Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	DOSE(j,t), mrem/yr							
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137	Cs-137	1.000E+00	7.977E-02	7.795E-02	7.442E-02	6.329E-02	3.984E-02	7.886E-03	7.706E-05	7.109E-12
Ra-226	Ra-226	1.000E+00	2.971E+00	2.963E+00	2.946E+00	2.889E+00	2.731E+00	2.244E+00	1.280E+00	1.794E-01
Pb-210	Ra-226	1.000E+00	1.282E-03	3.786E-03	8.534E-03	2.270E-02	4.763E-02	6.214E-02	3.728E-02	5.226E-03
Sr-90	Sr-90	1.000E+00	1.716E-03	1.667E-03	1.572E-03	1.280E-03	7.123E-04	9.148E-05	2.598E-07	3.173E-16

THF(i) is the thread fraction of the parent nuclide.  
 § is used to indicate summation; the Greek sigma is not included in this font.

Individual Nuclide Soil Concentration  
 Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g							
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137	Cs-137	1.000E+00	1.130E-01	1.104E-01	1.054E-01	8.966E-02	5.644E-02	1.117E-02	1.092E-04	1.007E-11
Ra-226	Ra-226	1.000E+00	1.000E+00	9.972E-01	9.916E-01	9.723E-01	9.192E-01	7.553E-01	4.308E-01	6.039E-02
Pb-210	Ra-226	1.000E+00	0.000E+00	3.054E-02	8.844E-02	2.612E-01	5.656E-01	7.448E-01	4.472E-01	6.270E-02
Sr-90	Sr-90	1.000E+00	3.310E-01	3.214E-01	3.031E-01	2.469E-01	1.374E-01	1.764E-02	5.010E-05	6.118E-14

THF(i) is the thread fraction of the parent nuclide.  
 § is used to indicate summation; the Greek sigma is not included in this font.

RESCALC.EXE execution time = 5.94 seconds

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Cancer Risk Slope Factors Summary Table  
 Risk Library: FGR 13 Morbidity

Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-1	Ground external radiation slope factors, 1/yr per (pCi/g):			
Sf-1	Cs-137+D	2.55E-06	5.32E-10	SLPF( 1,1)
Sf-1	Pb-210+D	4.21E-09	1.41E-09	SLPF( 2,1)
Sf-1	Ra-226+D	8.49E-06	2.29E-08	SLPF( 3,1)
Sf-1	Sr-90+D	1.96E-08	4.82E-10	SLPF( 4,1)
Sf-2	Inhalation, slope factors, 1/(pCi):			
Sf-2	Cs-137+D	1.12E-10	1.12E-10	SLPF( 1,2)
Sf-2	Pb-210+D	3.08E-08	1.58E-08	SLPF( 2,2)
Sf-2	Ra-226+D	2.83E-08	2.82E-08	SLPF( 3,2)
Sf-2	Sr-90+D	4.33E-10	4.25E-10	SLPF( 4,2)
Sf-3	Food ingestion, slope factors, 1/(pCi):			
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF( 1,3)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF( 2,3)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF( 3,3)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF( 4,3)
Sf-3	Water ingestion, slope factors, 1/(pCi):			
Sf-3	Cs-137+D	3.04E-11	3.04E-11	SLPF( 1,4)
Sf-3	Pb-210+D	2.66E-09	8.81E-10	SLPF( 2,4)
Sf-3	Ra-226+D	3.86E-10	3.85E-10	SLPF( 3,4)
Sf-3	Sr-90+D	7.40E-11	5.59E-11	SLPF( 4,4)
Sf-3	Soil ingestion, slope factors, 1/(pCi):			
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF( 1,5)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF( 2,5)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF( 3,5)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF( 4,5)
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	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)

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

Risk Slope and Environmental Transport Factors for the Ground Pathway

Nuclide (i)	Slope(i)*	ETFG(i,t) At Time in Years (dimensionless)							
		t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
At-218	3.570E-09	2.735E-03	2.735E-03	2.735E-03	2.735E-03	2.735E-03	2.735E-03	2.735E-03	2.735E-03
Ba-137m	2.690E-06	2.092E-01	2.092E-01	2.092E-01	2.092E-01	2.092E-01	2.092E-01	2.092E-01	2.092E-01
Bi-210	2.760E-09	1.097E-01	1.097E-01	1.097E-01	1.097E-01	1.097E-01	1.097E-01	1.097E-01	1.097E-01
Bi-214	7.480E-06	2.792E-01	2.792E-01	2.792E-01	2.792E-01	2.792E-01	2.792E-01	2.792E-01	2.792E-01
Cs-137	5.320E-10	7.432E-02	7.432E-02	7.432E-02	7.432E-02	7.432E-02	7.432E-02	7.432E-02	7.432E-02
Pb-210	1.410E-09	4.208E-04	4.208E-04	4.208E-04	4.208E-04	4.208E-04	4.208E-04	4.208E-04	4.208E-04
Pb-214	9.820E-07	1.626E-01	1.626E-01	1.626E-01	1.626E-01	1.626E-01	1.626E-01	1.626E-01	1.626E-01
Po-210	3.950E-11	2.255E-01	2.255E-01	2.255E-01	2.255E-01	2.255E-01	2.255E-01	2.255E-01	2.255E-01
Po-214	3.860E-10	2.298E-01	2.298E-01	2.298E-01	2.298E-01	2.298E-01	2.298E-01	2.298E-01	2.298E-01
Po-218	4.260E-11	2.303E-01	2.303E-01	2.303E-01	2.303E-01	2.303E-01	2.303E-01	2.303E-01	2.303E-01
Ra-226	2.290E-08	1.142E-01	1.142E-01	1.142E-01	1.142E-01	1.142E-01	1.142E-01	1.142E-01	1.142E-01
Rn-222	1.740E-09	1.986E-01	1.986E-01	1.986E-01	1.986E-01	1.986E-01	1.986E-01	1.986E-01	1.986E-01
Sr-90	4.820E-10	6.096E-02	6.096E-02	6.096E-02	6.096E-02	6.096E-02	6.096E-02	6.096E-02	6.096E-02
Tl-210	0.000E+00	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01
Y-90	1.910E-08	1.440E-01	1.440E-01	1.440E-01	1.440E-01	1.440E-01	1.440E-01	1.440E-01	1.440E-01
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

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

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	
Cs-137	4.304E-03	0.000E+00	0.000E+00	0.000E+00	1.276E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.276E+00
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	3.809E-02	0.000E+00	0.000E+00	0.000E+00	1.129E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.129E+01
Sr-90	1.261E-02	0.000E+00	0.000E+00	0.000E+00	3.738E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.738E+00

\* 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

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= 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.
Cs-137	1.108E-06	0.0206	8.876E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.790E-10	0.0000
Pb-210	2.135E-09	0.0000	8.011E-09	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.660E-07	0.0049
Ra-226	5.224E-05	0.9709	2.499E-08	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.349E-07	0.0025
Sr-90	1.586E-08	0.0003	9.415E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.139E-09	0.0001
Total	5.337E-05	0.9918	3.310E-08	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.079E-07	0.0076

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.								
Cs-137	0.000E+00	0.0000	1.109E-06	0.0206								
Pb-210	0.000E+00	0.0000	2.761E-07	0.0051								
Ra-226	0.000E+00	0.0000	5.240E-05	0.9739								
Sr-90	0.000E+00	0.0000	2.209E-08	0.0004								
===== Total	0.000E+00	0.0000	5.381E-05	1.0000								

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

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 CNRSI(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.
Cs-137	1.108E-06	0.0206	8.876E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.790E-10	0.0000
Ra-226	5.225E-05	0.9709	3.300E-08	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.009E-07	0.0074
Sr-90	1.586E-08	0.0003	9.415E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.139E-09	0.0001
===== Total	5.337E-05	0.9918	3.310E-08	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.079E-07	0.0076

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	1.109E-06	0.0206										
Ra-226	0.000E+00	0.0000	5.268E-05	0.9790										
Sr-90	0.000E+00	0.0000	2.209E-08	0.0004										
===== Total	0.000E+00	0.0000	5.381E-05	1.0000										

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

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	
Cs-137	4.205E-03	0.000E+00	0.000E+00	0.000E+00	1.247E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.247E+00
Pb-210	1.163E-03	0.000E+00	0.000E+00	0.000E+00	3.449E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.449E-01
Ra-226	3.798E-02	0.000E+00	0.000E+00	0.000E+00	1.126E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.126E+01
Sr-90	1.224E-02	0.000E+00	0.000E+00	0.000E+00	3.630E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.630E+00

\* 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= 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

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 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.
Cs-137	1.083E-06	0.0202	8.673E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.589E-10	0.0000
Pb-210	2.288E-09	0.0000	8.583E-09	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.850E-07	0.0053
Ra-226	5.210E-05	0.9709	2.492E-08	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.346E-07	0.0025
Sr-90	1.540E-08	0.0003	9.143E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.962E-09	0.0001
Total	5.320E-05	0.9914	3.360E-08	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.263E-07	0.0079

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.								
Cs-137	0.000E+00	0.0000	1.083E-06	0.0202								
Pb-210	0.000E+00	0.0000	2.958E-07	0.0055								
Ra-226	0.000E+00	0.0000	5.226E-05	0.9739								
Sr-90	0.000E+00	0.0000	2.145E-08	0.0004								
===== Total	0.000E+00	0.0000	5.366E-05	1.0000								

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

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

Total Excess Cancer Risk CNRSI(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.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Cs-137	1.083E-06	0.0202	8.673E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.589E-10	0.0000
Ra-226	5.210E-05	0.9710	3.350E-08	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.195E-07	0.0078
Sr-90	1.540E-08	0.0003	9.143E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.962E-09	0.0001
===== Total	5.320E-05	0.9914	3.360E-08	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.263E-07	0.0079

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	1.083E-06	0.0202										
Ra-226	0.000E+00	0.0000	5.255E-05	0.9794										
Sr-90	0.000E+00	0.0000	2.145E-08	0.0004										
===== Total	0.000E+00	0.0000	5.366E-05	1.0000										

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

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	
Cs-137	4.015E-03	0.000E+00	0.000E+00	0.000E+00	1.191E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.191E+00
Pb-210	3.368E-03	0.000E+00	0.000E+00	0.000E+00	9.988E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.988E-01
Ra-226	3.777E-02	0.000E+00	0.000E+00	0.000E+00	1.120E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.120E+01
Sr-90	1.154E-02	0.000E+00	0.000E+00	0.000E+00	3.424E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.424E+00

\* 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

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.
Cs-137	1.034E-06	0.0194	8.281E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.201E-10	0.0000
Pb-210	2.576E-09	0.0000	9.666E-09	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.209E-07	0.0060
Ra-226	5.181E-05	0.9710	2.478E-08	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.338E-07	0.0025
Sr-90	1.452E-08	0.0003	8.622E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.622E-09	0.0001
Total	5.286E-05	0.9907	3.454E-08	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.611E-07	0.0086

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.								
Cs-137	0.000E+00	0.0000	1.034E-06	0.0194								
Pb-210	0.000E+00	0.0000	3.331E-07	0.0062								
Ra-226	0.000E+00	0.0000	5.197E-05	0.9740								
Sr-90	0.000E+00	0.0000	2.023E-08	0.0004								
===== Total	0.000E+00	0.0000	5.335E-05	1.0000								

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

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 CNRSI(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.
Cs-137	1.034E-06	0.0194	8.281E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.201E-10	0.0000
Ra-226	5.181E-05	0.9711	3.445E-08	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.547E-07	0.0085
Sr-90	1.452E-08	0.0003	8.622E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.622E-09	0.0001
===== Total	5.286E-05	0.9907	3.454E-08	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.611E-07	0.0086

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	1.034E-06	0.0194										
Ra-226	0.000E+00	0.0000	5.230E-05	0.9802										
Sr-90	0.000E+00	0.0000	2.023E-08	0.0004										
===== Total	0.000E+00	0.0000	5.335E-05	1.0000										

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

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	
Cs-137	3.415E-03	0.000E+00	0.000E+00	0.000E+00	1.013E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.013E+00
Pb-210	9.947E-03	0.000E+00	0.000E+00	0.000E+00	2.950E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.950E+00
Ra-226	3.703E-02	0.000E+00	0.000E+00	0.000E+00	1.098E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.098E+01
Sr-90	9.403E-03	0.000E+00	0.000E+00	0.000E+00	2.788E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.788E+00

\* 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= 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

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.
Cs-137	8.791E-07	0.0168	7.043E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.974E-10	0.0000
Pb-210	3.431E-09	0.0001	1.287E-08	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.274E-07	0.0082
Ra-226	5.080E-05	0.9714	2.430E-08	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.312E-07	0.0025
Sr-90	1.183E-08	0.0002	7.022E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.579E-09	0.0001
Total	5.169E-05	0.9885	3.725E-08	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.639E-07	0.0108

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.								
Cs-137	0.000E+00	0.0000	8.798E-07	0.0168								
Pb-210	0.000E+00	0.0000	4.437E-07	0.0085								
Ra-226	0.000E+00	0.0000	5.095E-05	0.9744								
Sr-90	0.000E+00	0.0000	1.648E-08	0.0003								
===== Total	0.000E+00	0.0000	5.229E-05	1.0000								

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

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 CNRSI(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.
Cs-137	8.791E-07	0.0168	7.043E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.974E-10	0.0000
Ra-226	5.080E-05	0.9715	3.717E-08	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.586E-07	0.0107
Sr-90	1.183E-08	0.0002	7.022E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.579E-09	0.0001
===== Total	5.169E-05	0.9885	3.725E-08	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.639E-07	0.0108

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	8.798E-07	0.0168										
Ra-226	0.000E+00	0.0000	5.140E-05	0.9829										
Sr-90	0.000E+00	0.0000	1.648E-08	0.0003										
===== Total	0.000E+00	0.0000	5.229E-05	1.0000										

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

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As pCi/yr at t= 3.000E+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	
Cs-137	2.150E-03	0.000E+00	0.000E+00	0.000E+00	6.374E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.374E-01
Pb-210	2.154E-02	0.000E+00	0.000E+00	0.000E+00	6.389E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.389E+00
Ra-226	3.501E-02	0.000E+00	0.000E+00	0.000E+00	1.038E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.038E+01
Sr-90	5.231E-03	0.000E+00	0.000E+00	0.000E+00	1.551E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.551E+00

\* 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+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

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p) and Fraction of Total Risk at t= 3.000E+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.
Cs-137	5.534E-07	0.0112	4.433E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.390E-10	0.0000
Pb-210	4.898E-09	0.0001	1.838E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.101E-07	0.0124
Ra-226	4.803E-05	0.9728	2.297E-08	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.240E-07	0.0025
Sr-90	6.580E-09	0.0001	3.907E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.548E-09	0.0001
Total	4.859E-05	0.9842	4.139E-08	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.371E-07	0.0149

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Cs-137	0.000E+00	0.0000	5.538E-07	0.0112								
Pb-210	0.000E+00	0.0000	6.334E-07	0.0128								
Ra-226	0.000E+00	0.0000	4.817E-05	0.9758								
Sr-90	0.000E+00	0.0000	9.167E-09	0.0002								
===== Total	0.000E+00	0.0000	4.937E-05	1.0000								

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

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of  
 Radon and its Decay Products at t= 3.000E+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 CNRSI(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
 and Fraction of Total Risk at t= 3.000E+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.
Cs-137	5.534E-07	0.0112	4.433E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.390E-10	0.0000
Ra-226	4.803E-05	0.9729	4.135E-08	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.341E-07	0.0149
Sr-90	6.580E-09	0.0001	3.907E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.548E-09	0.0001
===== Total	4.859E-05	0.9842	4.139E-08	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.371E-07	0.0149

Total Excess Cancer Risk CNRSI(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
 and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.										
Cs-137	0.000E+00	0.0000	5.538E-07	0.0112										
Ra-226	0.000E+00	0.0000	4.881E-05	0.9886										
Sr-90	0.000E+00	0.0000	9.167E-09	0.0002										
===== Total	0.000E+00	0.0000	4.937E-05	1.0000										

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

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	
Cs-137	4.254E-04	0.000E+00	0.000E+00	0.000E+00	1.262E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.262E-01
Pb-210	2.837E-02	0.000E+00	0.000E+00	0.000E+00	8.413E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.413E+00
Ra-226	2.876E-02	0.000E+00	0.000E+00	0.000E+00	8.530E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.530E+00
Sr-90	6.718E-04	0.000E+00	0.000E+00	0.000E+00	1.992E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.992E-01

\* 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= 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

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 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.
Cs-137	1.095E-07	0.0027	8.775E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.689E-11	0.0000
Pb-210	5.477E-09	0.0001	2.055E-08	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.823E-07	0.0169
Ra-226	3.946E-05	0.9767	1.887E-08	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.019E-07	0.0025
Sr-90	8.451E-10	0.0000	5.018E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.272E-10	0.0000
Total	3.957E-05	0.9796	3.943E-08	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.846E-07	0.0194

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.								
Cs-137	0.000E+00	0.0000	1.096E-07	0.0027								
Pb-210	0.000E+00	0.0000	7.083E-07	0.0175								
Ra-226	0.000E+00	0.0000	3.958E-05	0.9797								
Sr-90	0.000E+00	0.0000	1.177E-09	0.0000								
===== Total	0.000E+00	0.0000	4.040E-05	1.0000								

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

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 CNRSI(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
 and Fraction of Total Risk at t= 1.000E+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.
Cs-137	1.095E-07	0.0027	8.775E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.689E-11	0.0000
Ra-226	3.946E-05	0.9769	3.943E-08	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.842E-07	0.0194
Sr-90	8.451E-10	0.0000	5.018E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.272E-10	0.0000
===== Total	3.957E-05	0.9796	3.943E-08	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.846E-07	0.0194

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	1.096E-07	0.0027										
Ra-226	0.000E+00	0.0000	4.029E-05	0.9973										
Sr-90	0.000E+00	0.0000	1.177E-09	0.0000										
===== Total	0.000E+00	0.0000	4.040E-05	1.0000										

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

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	
Cs-137	4.157E-06	0.000E+00	0.000E+00	0.000E+00	1.233E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.233E-03
Pb-210	1.703E-02	0.000E+00	0.000E+00	0.000E+00	5.051E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.051E+00
Ra-226	1.641E-02	0.000E+00	0.000E+00	0.000E+00	4.866E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.866E+00
Sr-90	1.908E-06	0.000E+00	0.000E+00	0.000E+00	5.659E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.659E-04

\* 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+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

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)

Radio-Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Cs-137	1.070E-09	0.0000	8.575E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.491E-13	0.0000
Pb-210	3.240E-09	0.0001	1.216E-08	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.036E-07	0.0176
Ra-226	2.251E-05	0.9787	1.077E-08	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.813E-08	0.0025
Sr-90	2.400E-12	0.0000	1.425E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.293E-13	0.0000
Total	2.251E-05	0.9789	2.292E-08	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.618E-07	0.0201

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.								
Cs-137	0.000E+00	0.0000	1.071E-09	0.0000								
Pb-210	0.000E+00	0.0000	4.190E-07	0.0182								
Ra-226	0.000E+00	0.0000	2.258E-05	0.9817								
Sr-90	0.000E+00	0.0000	3.344E-12	0.0000								
===== Total	0.000E+00	0.0000	2.300E-05	1.0000								

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

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 CNRSI(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
 and Fraction of Total Risk at t= 3.000E+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.
Cs-137	1.070E-09	0.0000	8.575E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.491E-13	0.0000
Ra-226	2.251E-05	0.9789	2.292E-08	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.618E-07	0.0201
Sr-90	2.400E-12	0.0000	1.425E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.293E-13	0.0000
===== Total	2.251E-05	0.9789	2.292E-08	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.618E-07	0.0201

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	1.071E-09	0.0000										
Ra-226	0.000E+00	0.0000	2.300E-05	1.0000										
Sr-90	0.000E+00	0.0000	3.344E-12	0.0000										
===== Total	0.000E+00	0.0000	2.300E-05	1.0000										

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

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	
Cs-137	3.835E-13	0.000E+00	0.000E+00	0.000E+00	1.137E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.137E-10
Pb-210	2.388E-03	0.000E+00	0.000E+00	0.000E+00	7.081E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.081E-01
Ra-226	2.300E-03	0.000E+00	0.000E+00	0.000E+00	6.821E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.821E-01
Sr-90	2.330E-15	0.000E+00	0.000E+00	0.000E+00	6.910E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.910E-13
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

\* 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= 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.
Cs-137	9.873E-17	0.0000	7.910E-22	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.833E-20	0.0000
Pb-210	4.543E-10	0.0001	1.705E-09	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.659E-08	0.0176
Ra-226	3.155E-06	0.9788	1.509E-09	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.149E-09	0.0025
Sr-90	2.931E-21	0.0000	1.740E-23	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.135E-21	0.0000
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Total	3.156E-06	0.9789	3.214E-09	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.474E-08	0.0201

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.								
Cs-137	0.000E+00	0.0000	9.881E-17	0.0000								
Pb-210	0.000E+00	0.0000	5.875E-08	0.0182								
Ra-226	0.000E+00	0.0000	3.165E-06	0.9818								
Sr-90	0.000E+00	0.0000	4.083E-21	0.0000								
===== Total	0.000E+00	0.0000	3.224E-06	1.0000								

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

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 CNRSI(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	fract.
Cs-137	9.873E-17	0.0000	7.910E-22	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.833E-20	0.0000
Ra-226	3.156E-06	0.9789	3.214E-09	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.474E-08	0.0201
Sr-90	2.931E-21	0.0000	1.740E-23	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.135E-21	0.0000
===== Total	3.156E-06	0.9789	3.214E-09	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.474E-08	0.0201

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	9.881E-17	0.0000										
Ra-226	0.000E+00	0.0000	3.224E-06	1.0000										
Sr-90	0.000E+00	0.0000	4.083E-21	0.0000										
===== Total	0.000E+00	0.0000	3.224E-06	1.0000										

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

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Dose Conversion Factor (and Related) Parameter Summary  
 File: FGR 13 MORBIDITY

Menu	Parameter	Current Value	Base Case*	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2( 1)
B-1	Pb-210+D	2.320E-02	1.360E-02	DCF2( 2)
B-1	Ra-226+D	8.594E-03	8.580E-03	DCF2( 3)
B-1	Sr-90+D	1.308E-03	1.300E-03	DCF2( 4)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3( 1)
D-1	Pb-210+D	7.276E-03	5.370E-03	DCF3( 2)
D-1	Ra-226+D	1.321E-03	1.320E-03	DCF3( 3)
D-1	Sr-90+D	1.528E-04	1.420E-04	DCF3( 4)
D-34	Food transfer factors:			
D-34	Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF( 1,1)
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF( 1,2)
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF( 1,3)
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF( 2,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF( 2,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF( 2,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF( 3,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF( 3,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF( 3,3)
D-34				
D-34	Sr-90+D , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF( 4,1)
D-34	Sr-90+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-03	8.000E-03	RTF( 4,2)
D-34	Sr-90+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF( 4,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC( 1,1)
D-5	Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC( 1,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC( 2,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC( 2,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC( 3,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC( 3,2)
D-5				
D-5	Sr-90+D , fish	6.000E+01	6.000E+01	BIOFAC( 4,1)
D-5	Sr-90+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC( 4,2)

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

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.000E+04	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	2.000E+00	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	not used	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T( 2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T( 3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T( 4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T( 5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T( 6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T( 7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T( 8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T( 9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Cs-137	1.130E-01	0.000E+00	---	SI( 1)
R012	Initial principal radionuclide (pCi/g): Ra-226	1.000E+00	0.000E+00	---	SI( 3)
R012	Initial principal radionuclide (pCi/g): Sr-90	3.310E-01	0.000E+00	---	SI( 4)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	WI( 1)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	WI( 3)
R012	Concentration in groundwater (pCi/L): Sr-90	not used	0.000E+00	---	WI( 4)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	2.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.000E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	not used	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	not used	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	not used	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	not used	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	not used	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	not used	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	not used	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	not used	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	not used	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	not used	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	not used	ND	---	MODEL

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R014	Well pumping rate (m**3/yr)	not used	2.500E+02	---	UW
R015	Number of unsaturated zone strata	not used	1	---	NS
R015	Unsat. zone 1, thickness (m)	not used	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	not used	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	not used	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	not used	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	not used	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	not used	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	not used	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	4.600E+03	4.600E+03	---	DCNUCC( 1)
R016	Unsat. zone 1 (cm**3/g)	not used	4.600E+03	---	DCNUCU( 1,1)
R016	Saturated zone (cm**3/g)	not used	4.600E+03	---	DCNUCS( 1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.623E-05	ALEACH( 1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 1)
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC( 3)
R016	Unsat. zone 1 (cm**3/g)	not used	7.000E+01	---	DCNUCU( 3,1)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS( 3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.374E-03	ALEACH( 3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 3)
R016	Distribution coefficients for Sr-90				
R016	Contaminated zone (cm**3/g)	3.000E+01	3.000E+01	---	DCNUCC( 4)
R016	Unsat. zone 1 (cm**3/g)	not used	3.000E+01	---	DCNUCU( 4,1)
R016	Saturated zone (cm**3/g)	not used	3.000E+01	---	DCNUCS( 4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.516E-03	ALEACH( 4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 4)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC( 2)
R016	Unsat. zone 1 (cm**3/g)	not used	1.000E+02	---	DCNUCU( 2,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS( 2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.663E-03	ALEACH( 2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 2)
R017	Inhalation rate (m**3/yr)	7.270E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	2.400E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	9.590E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE( 1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE( 2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE( 3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE( 4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE( 5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE( 6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE( 7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE( 8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE( 9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA( 1)
R017	Ring 2	not used	2.732E-01	---	FRACA( 2)
R017	Ring 3	not used	0.000E+00	---	FRACA( 3)
R017	Ring 4	not used	0.000E+00	---	FRACA( 4)
R017	Ring 5	not used	0.000E+00	---	FRACA( 5)
R017	Ring 6	not used	0.000E+00	---	FRACA( 6)
R017	Ring 7	not used	0.000E+00	---	FRACA( 7)
R017	Ring 8	not used	0.000E+00	---	FRACA( 8)
R017	Ring 9	not used	0.000E+00	---	FRACA( 9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	not used	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	not used	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	not used	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	not used	-1	---	FPLANT
R018	Contamination fraction of meat	not used	-1	---	FMEAT
R018	Contamination fraction of milk	not used	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	not used	5.000E-01	---	LSI
R019	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	---	MLFD

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	not used	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	not used	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	not used	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	not used	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	not used	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	not used	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	not used	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	not used	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	not used	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
C14	DCF correction factor for gaseous forms of C14	not used	0.000E+00	---	CO2F
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA (1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA (2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	257	---	---	KYMAX

Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	active
2 -- inhalation (w/o radon)	active
3 -- plant ingestion	suppressed
4 -- meat ingestion	suppressed
5 -- milk ingestion	suppressed
6 -- aquatic foods	suppressed
7 -- drinking water	suppressed
8 -- soil ingestion	active
9 -- radon	suppressed
Find peak pathway doses	suppressed

Contaminated Zone Dimensions

Initial Soil Concentrations, pCi/g

Area:	10000.00 square meters	Cs-137	1.130E-01
Thickness:	2.00 meters	Ra-226	1.000E+00
Cover Depth:	0.00 meters	Sr-90	3.310E-01

Total Dose TDOSE(t), mrem/yr

Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	1.048E+01	1.045E+01	1.039E+01	1.019E+01	9.628E+00	7.874E+00	4.478E+00	6.277E-01
M(t):	4.190E-01	4.179E-01	4.156E-01	4.076E-01	3.851E-01	3.150E-01	1.791E-01	2.511E-02

Maximum TDOSE(t): 1.048E+01 mrem/yr at t = 0.000E+00 years

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	3.420E-01	0.0327	4.206E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.955E-04	0.0000
Ra-226	1.007E+01	0.9616	1.055E-03	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.008E-02	0.0048
Sr-90	7.233E-03	0.0007	5.038E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.745E-03	0.0002
===== Total	1.042E+01	0.9949	1.106E-03	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.202E-02	0.0050

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	3.422E-01	0.0327										
Ra-226	0.000E+00	0.0000	1.012E+01	0.9665										
Sr-90	0.000E+00	0.0000	9.028E-03	0.0009										
===== Total	0.000E+00	0.0000	1.048E+01	1.0000										

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	3.342E-01	0.0320	4.110E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.910E-04	0.0000
Ra-226	1.005E+01	0.9615	1.134E-03	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.759E-02	0.0055
Sr-90	7.024E-03	0.0007	4.892E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.694E-03	0.0002
===== Total	1.039E+01	0.9942	1.184E-03	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.948E-02	0.0057

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	3.344E-01	0.0320										
Ra-226	0.000E+00	0.0000	1.010E+01	0.9672										
Sr-90	0.000E+00	0.0000	8.767E-03	0.0008										
===== Total	0.000E+00	0.0000	1.045E+01	1.0000										

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	3.191E-01	0.0307	3.924E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.824E-04	0.0000
Ra-226	9.990E+00	0.9614	1.284E-03	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.182E-02	0.0069
Sr-90	6.624E-03	0.0006	4.614E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.598E-03	0.0002
===== Total	1.032E+01	0.9928	1.331E-03	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.360E-02	0.0071

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	3.193E-01	0.0307										
Ra-226	0.000E+00	0.0000	1.006E+01	0.9685										
Sr-90	0.000E+00	0.0000	8.268E-03	0.0008										
===== Total	0.000E+00	0.0000	1.039E+01	1.0000										

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	2.714E-01	0.0266	3.337E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.551E-04	0.0000
Ra-226	9.796E+00	0.9613	1.729E-03	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.141E-01	0.0112
Sr-90	5.395E-03	0.0005	3.758E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.301E-03	0.0001
===== Total	1.007E+01	0.9885	1.767E-03	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.156E-01	0.0113

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	2.715E-01	0.0266										
Ra-226	0.000E+00	0.0000	9.912E+00	0.9727										
Sr-90	0.000E+00	0.0000	6.734E-03	0.0007										
===== Total	0.000E+00	0.0000	1.019E+01	1.0000										

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	1.708E-01	0.0177	2.101E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.764E-05	0.0000
Ra-226	9.263E+00	0.9621	2.493E-03	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.878E-01	0.0195
Sr-90	3.001E-03	0.0003	2.090E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.240E-04	0.0001
===== Total	9.437E+00	0.9802	2.515E-03	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.886E-01	0.0196

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	1.709E-01	0.0178										
Ra-226	0.000E+00	0.0000	9.453E+00	0.9819										
Sr-90	0.000E+00	0.0000	3.746E-03	0.0004										
===== Total	0.000E+00	0.0000	9.628E+00	1.0000										

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	3.381E-02	0.0043	4.158E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.933E-05	0.0000
Ra-226	7.612E+00	0.9668	2.803E-03	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.245E-01	0.0285
Sr-90	3.855E-04	0.0000	2.685E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.298E-05	0.0000
===== Total	7.646E+00	0.9711	2.806E-03	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.246E-01	0.0285

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	3.383E-02	0.0043										
Ra-226	0.000E+00	0.0000	7.840E+00	0.9956										
Sr-90	0.000E+00	0.0000	4.811E-04	0.0001										
===== Total	0.000E+00	0.0000	7.874E+00	1.0000										

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	3.304E-04	0.0001	4.063E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.889E-07	0.0000
Ra-226	4.342E+00	0.9697	1.659E-03	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.336E-01	0.0298
Sr-90	1.095E-06	0.0000	7.626E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.641E-07	0.0000
===== Total	4.343E+00	0.9698	1.659E-03	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.336E-01	0.0298

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	3.306E-04	0.0001										
Ra-226	0.000E+00	0.0000	4.478E+00	0.9999										
Sr-90	0.000E+00	0.0000	1.367E-06	0.0000										
===== Total	0.000E+00	0.0000	4.478E+00	1.0000										

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	3.048E-11	0.0000	3.748E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.742E-14	0.0000
Ra-226	6.087E-01	0.9698	2.326E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.874E-02	0.0298
Sr-90	1.337E-15	0.0000	9.311E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.225E-16	0.0000
===== Total	6.087E-01	0.9698	2.326E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.874E-02	0.0298

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.										
Cs-137	0.000E+00	0.0000	3.050E-11	0.0000										
Ra-226	0.000E+00	0.0000	6.277E-01	1.0000										
Sr-90	0.000E+00	0.0000	1.669E-15	0.0000										
===== Total	0.000E+00	0.0000	6.277E-01	1.0000										

\*Sum of all water independent and dependent pathways.

Dose/Source Ratios Summed Over All Pathways  
 Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137+D	Cs-137+D	1.000E+00	3.029E+00	2.959E+00	2.826E+00	2.403E+00	1.513E+00	2.994E-01	2.926E-03	2.699E-10
Ra-226+D	Ra-226+D	1.000E+00	1.012E+01	1.009E+01	1.004E+01	9.841E+00	9.303E+00	7.644E+00	4.360E+00	6.112E-01
Ra-226+D	Pb-210+D	1.000E+00	4.040E-03	1.193E-02	2.689E-02	7.152E-02	1.501E-01	1.958E-01	1.175E-01	1.647E-02
Ra-226+D	§DSR(j)		1.012E+01	1.010E+01	1.006E+01	9.912E+00	9.453E+00	7.840E+00	4.478E+00	6.277E-01
Sr-90+D	Sr-90+D	1.000E+00	2.728E-02	2.649E-02	2.498E-02	2.034E-02	1.132E-02	1.454E-03	4.129E-06	5.041E-15

§ is used to indicate summation; the Greek sigma is not included in this font.  
 The DSR includes contributions from associated (half-life <= 180 days) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g  
 Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Nuclide (i)	t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137		8.254E+00	8.448E+00	8.848E+00	1.040E+01	1.653E+01	8.350E+01	8.545E+03	9.263E+10
Ra-226		2.469E+00	2.474E+00	2.484E+00	2.522E+00	2.645E+00	3.189E+00	5.583E+00	3.983E+01
Sr-90		9.166E+02	9.438E+02	1.001E+03	1.229E+03	2.209E+03	1.720E+04	6.055E+06	*1.365E+14

\*At specific activity limit

Summed Dose/Source Ratios DSR(i,t) in (mrem/yr)/(pCi/g)  
 and Single Radionuclide Soil Guidelines G(i,t) in pCi/g  
 at tmin = time of minimum single radionuclide soil guideline  
 and at tmax = time of maximum total dose = 0.000E+00 years

Nuclide (i)	Initial (pCi/g)	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Cs-137	1.130E-01	0.000E+00	3.029E+00	8.254E+00	3.029E+00	8.254E+00
Ra-226	1.000E+00	0.000E+00	1.012E+01	2.469E+00	1.012E+01	2.469E+00
Sr-90	3.310E-01	0.000E+00	2.728E-02	9.166E+02	2.728E-02	9.166E+02

Individual Nuclide Dose Summed Over All Pathways  
 Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	DOSE(j,t), mrem/yr							
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137	Cs-137	1.000E+00	3.422E-01	3.344E-01	3.193E-01	2.715E-01	1.709E-01	3.383E-02	3.306E-04	3.050E-11
Ra-226	Ra-226	1.000E+00	1.012E+01	1.009E+01	1.004E+01	9.841E+00	9.303E+00	7.644E+00	4.360E+00	6.112E-01
Pb-210	Ra-226	1.000E+00	4.040E-03	1.193E-02	2.689E-02	7.152E-02	1.501E-01	1.958E-01	1.175E-01	1.647E-02
Sr-90	Sr-90	1.000E+00	9.028E-03	8.767E-03	8.268E-03	6.734E-03	3.746E-03	4.811E-04	1.367E-06	1.669E-15

THF(i) is the thread fraction of the parent nuclide.  
 § is used to indicate summation; the Greek sigma is not included in this font.

Individual Nuclide Soil Concentration  
 Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g							
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137	Cs-137	1.000E+00	1.130E-01	1.104E-01	1.054E-01	8.966E-02	5.644E-02	1.117E-02	1.092E-04	1.007E-11
Ra-226	Ra-226	1.000E+00	1.000E+00	9.972E-01	9.916E-01	9.723E-01	9.192E-01	7.553E-01	4.308E-01	6.039E-02
Pb-210	Ra-226	1.000E+00	0.000E+00	3.054E-02	8.844E-02	2.612E-01	5.656E-01	7.448E-01	4.472E-01	6.270E-02
Sr-90	Sr-90	1.000E+00	3.310E-01	3.214E-01	3.031E-01	2.469E-01	1.374E-01	1.764E-02	5.010E-05	6.118E-14

THF(i) is the thread fraction of the parent nuclide.  
 § is used to indicate summation; the Greek sigma is not included in this font.

RESCALC.EXE execution time = 1.87 seconds

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Cancer Risk Slope Factors Summary Table  
 Risk Library: FGR 13 Morbidity

Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-1	Ground external radiation slope factors, 1/yr per (pCi/g):			
Sf-1	Cs-137+D	2.55E-06	5.32E-10	SLPF( 1,1)
Sf-1	Pb-210+D	4.21E-09	1.41E-09	SLPF( 2,1)
Sf-1	Ra-226+D	8.49E-06	2.29E-08	SLPF( 3,1)
Sf-1	Sr-90+D	1.96E-08	4.82E-10	SLPF( 4,1)
Sf-2	Inhalation, slope factors, 1/(pCi):			
Sf-2	Cs-137+D	1.12E-10	1.12E-10	SLPF( 1,2)
Sf-2	Pb-210+D	3.08E-08	1.58E-08	SLPF( 2,2)
Sf-2	Ra-226+D	2.83E-08	2.82E-08	SLPF( 3,2)
Sf-2	Sr-90+D	4.33E-10	4.25E-10	SLPF( 4,2)
Sf-3	Food ingestion, slope factors, 1/(pCi):			
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF( 1,3)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF( 2,3)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF( 3,3)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF( 4,3)
Sf-3	Water ingestion, slope factors, 1/(pCi):			
Sf-3	Cs-137+D	3.04E-11	3.04E-11	SLPF( 1,4)
Sf-3	Pb-210+D	2.66E-09	8.81E-10	SLPF( 2,4)
Sf-3	Ra-226+D	3.86E-10	3.85E-10	SLPF( 3,4)
Sf-3	Sr-90+D	7.40E-11	5.59E-11	SLPF( 4,4)
Sf-3	Soil ingestion, slope factors, 1/(pCi):			
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF( 1,5)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF( 2,5)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF( 3,5)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF( 4,5)
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	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)

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

Risk Slope and Environmental Transport Factors for the Ground Pathway

Nuclide (i)	Slope(i)*	ETFG(i,t) At Time in Years (dimensionless)							
		t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
At-218	3.570E-09	9.305E-01	9.305E-01	9.305E-01	9.305E-01	9.305E-01	9.305E-01	9.305E-01	9.305E-01
Ba-137m	2.690E-06	8.976E-01	8.976E-01	8.976E-01	8.976E-01	8.976E-01	8.976E-01	8.976E-01	8.976E-01
Bi-210	2.760E-09	9.063E-01	9.063E-01	9.063E-01	9.063E-01	9.063E-01	9.063E-01	9.063E-01	9.063E-01
Bi-214	7.480E-06	9.015E-01	9.015E-01	9.015E-01	9.015E-01	9.015E-01	9.015E-01	9.015E-01	9.015E-01
Cs-137	5.320E-10	9.113E-01	9.113E-01	9.113E-01	9.113E-01	9.113E-01	9.113E-01	9.113E-01	9.113E-01
Pb-210	1.410E-09	9.411E-01	9.411E-01	9.411E-01	9.411E-01	9.411E-01	9.411E-01	9.411E-01	9.411E-01
Pb-214	9.820E-07	9.059E-01	9.059E-01	9.059E-01	9.059E-01	9.059E-01	9.059E-01	9.059E-01	9.059E-01
Po-210	3.950E-11	9.005E-01	9.005E-01	9.005E-01	9.005E-01	9.005E-01	9.005E-01	9.005E-01	9.005E-01
Po-214	3.860E-10	8.976E-01	8.976E-01	8.976E-01	8.976E-01	8.976E-01	8.976E-01	8.976E-01	8.976E-01
Po-218	4.260E-11	9.005E-01	9.005E-01	9.005E-01	9.005E-01	9.005E-01	9.005E-01	9.005E-01	9.005E-01
Ra-226	2.290E-08	9.133E-01	9.133E-01	9.133E-01	9.133E-01	9.133E-01	9.133E-01	9.133E-01	9.133E-01
Rn-222	1.740E-09	8.986E-01	8.986E-01	8.986E-01	8.986E-01	8.986E-01	8.986E-01	8.986E-01	8.986E-01
Sr-90	4.820E-10	9.130E-01	9.130E-01	9.130E-01	9.130E-01	9.130E-01	9.130E-01	9.130E-01	9.130E-01
Tl-210	0.000E+00	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01	9.590E-01
Y-90	1.910E-08	9.005E-01	9.005E-01	9.005E-01	9.005E-01	9.005E-01	9.005E-01	9.005E-01	9.005E-01
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

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

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	
Cs-137	1.334E-02	0.000E+00	0.000E+00	0.000E+00	3.955E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.955E+00
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	1.180E-01	0.000E+00	0.000E+00	0.000E+00	3.500E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.500E+01
Sr-90	3.907E-02	0.000E+00	0.000E+00	0.000E+00	1.159E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.159E+01

\* 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

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= 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.
Cs-137	4.754E-06	0.0258	2.751E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.724E-09	0.0000
Pb-210	2.643E-08	0.0001	2.483E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.243E-07	0.0045
Ra-226	1.777E-04	0.9660	7.745E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.182E-07	0.0023
Sr-90	1.006E-07	0.0005	2.918E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.903E-08	0.0001
Total	1.826E-04	0.9926	1.026E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.264E-06	0.0069

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.								
Cs-137	0.000E+00	0.0000	4.757E-06	0.0259								
Pb-210	0.000E+00	0.0000	8.755E-07	0.0048								
Ra-226	0.000E+00	0.0000	1.782E-04	0.9687								
Sr-90	0.000E+00	0.0000	1.199E-07	0.0007								
===== Total	0.000E+00	0.0000	1.839E-04	1.0000								

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

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 CNRSI(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.
Cs-137	4.754E-06	0.0258	2.751E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.724E-09	0.0000
Ra-226	1.777E-04	0.9662	1.023E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.242E-06	0.0068
Sr-90	1.006E-07	0.0005	2.918E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.903E-08	0.0001
===== Total	1.826E-04	0.9926	1.026E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.264E-06	0.0069

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	4.757E-06	0.0259										
Ra-226	0.000E+00	0.0000	1.791E-04	0.9735										
Sr-90	0.000E+00	0.0000	1.199E-07	0.0007										
===== Total	0.000E+00	0.0000	1.839E-04	1.0000										

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

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	
Cs-137	1.303E-02	0.000E+00	0.000E+00	0.000E+00	3.865E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.865E+00
Pb-210	3.604E-03	0.000E+00	0.000E+00	0.000E+00	1.069E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.069E+00
Ra-226	1.177E-01	0.000E+00	0.000E+00	0.000E+00	3.491E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.491E+01
Sr-90	3.794E-02	0.000E+00	0.000E+00	0.000E+00	1.125E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.125E+01

\* 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= 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

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.
Cs-137	4.646E-06	0.0253	2.688E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.662E-09	0.0000
Pb-210	2.831E-08	0.0002	2.660E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.831E-07	0.0048
Ra-226	1.772E-04	0.9662	7.723E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.170E-07	0.0023
Sr-90	9.771E-08	0.0005	2.834E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.848E-08	0.0001
Total	1.820E-04	0.9922	1.041E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.321E-06	0.0072

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.								
Cs-137	0.000E+00	0.0000	4.648E-06	0.0253								
Pb-210	0.000E+00	0.0000	9.380E-07	0.0051								
Ra-226	0.000E+00	0.0000	1.777E-04	0.9689								
Sr-90	0.000E+00	0.0000	1.165E-07	0.0006								
===== Total	0.000E+00	0.0000	1.834E-04	1.0000								

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

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

Total Excess Cancer Risk CNRSI(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.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Cs-137	4.646E-06	0.0253	2.688E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.662E-09	0.0000
Ra-226	1.772E-04	0.9664	1.038E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.300E-06	0.0071
Sr-90	9.771E-08	0.0005	2.834E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.848E-08	0.0001
===== Total	1.820E-04	0.9922	1.041E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.321E-06	0.0072

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	4.648E-06	0.0253										
Ra-226	0.000E+00	0.0000	1.786E-04	0.9740										
Sr-90	0.000E+00	0.0000	1.165E-07	0.0006										
===== Total	0.000E+00	0.0000	1.834E-04	1.0000										

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

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	
Cs-137	1.244E-02	0.000E+00	0.000E+00	0.000E+00	3.690E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.690E+00
Pb-210	1.044E-02	0.000E+00	0.000E+00	0.000E+00	3.096E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.096E+00
Ra-226	1.170E-01	0.000E+00	0.000E+00	0.000E+00	3.471E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.471E+01
Sr-90	3.578E-02	0.000E+00	0.000E+00	0.000E+00	1.061E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.061E+01

\* 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

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 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.
Cs-137	4.435E-06	0.0243	2.566E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.541E-09	0.0000
Pb-210	3.188E-08	0.0002	2.996E-08	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.945E-07	0.0055
Ra-226	1.762E-04	0.9666	7.680E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.147E-07	0.0023
Sr-90	9.214E-08	0.0005	2.672E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.742E-08	0.0001
Total	1.808E-04	0.9916	1.070E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.429E-06	0.0078

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.								
Cs-137	0.000E+00	0.0000	4.438E-06	0.0243								
Pb-210	0.000E+00	0.0000	1.056E-06	0.0058								
Ra-226	0.000E+00	0.0000	1.767E-04	0.9693								
Sr-90	0.000E+00	0.0000	1.098E-07	0.0006								
===== Total	0.000E+00	0.0000	1.823E-04	1.0000								

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

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 CNRSI(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.
Cs-137	4.435E-06	0.0243	2.566E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.541E-09	0.0000
Ra-226	1.762E-04	0.9667	1.068E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.409E-06	0.0077
Sr-90	9.214E-08	0.0005	2.672E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.742E-08	0.0001
===== Total	1.808E-04	0.9916	1.070E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.429E-06	0.0078

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	4.438E-06	0.0243										
Ra-226	0.000E+00	0.0000	1.777E-04	0.9751										
Sr-90	0.000E+00	0.0000	1.098E-07	0.0006										
===== Total	0.000E+00	0.0000	1.823E-04	1.0000										

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

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	
Cs-137	1.058E-02	0.000E+00	0.000E+00	0.000E+00	3.138E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.138E+00
Pb-210	3.083E-02	0.000E+00	0.000E+00	0.000E+00	9.142E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.142E+00
Ra-226	1.148E-01	0.000E+00	0.000E+00	0.000E+00	3.403E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.403E+01
Sr-90	2.914E-02	0.000E+00	0.000E+00	0.000E+00	8.642E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.642E+00

\* 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= 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

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.
Cs-137	3.772E-06	0.0211	2.183E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.161E-09	0.0000
Pb-210	4.247E-08	0.0002	3.990E-08	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.325E-06	0.0074
Ra-226	1.728E-04	0.9678	7.530E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.066E-07	0.0023
Sr-90	7.505E-08	0.0004	2.176E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.419E-08	0.0001
Total	1.767E-04	0.9896	1.154E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.748E-06	0.0098

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.								
Cs-137	0.000E+00	0.0000	3.774E-06	0.0211								
Pb-210	0.000E+00	0.0000	1.407E-06	0.0079								
Ra-226	0.000E+00	0.0000	1.732E-04	0.9705								
Sr-90	0.000E+00	0.0000	8.945E-08	0.0005								
===== Total	0.000E+00	0.0000	1.785E-04	1.0000								

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

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 CNRSI(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.
Cs-137	3.772E-06	0.0211	2.183E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.161E-09	0.0000
Ra-226	1.728E-04	0.9680	1.152E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.731E-06	0.0097
Sr-90	7.505E-08	0.0004	2.176E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.419E-08	0.0001
===== Total	1.767E-04	0.9896	1.154E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.748E-06	0.0098

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	3.774E-06	0.0211										
Ra-226	0.000E+00	0.0000	1.747E-04	0.9784										
Sr-90	0.000E+00	0.0000	8.945E-08	0.0005										
===== Total	0.000E+00	0.0000	1.785E-04	1.0000										

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

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As pCi/yr at t= 3.000E+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	
Cs-137	6.662E-03	0.000E+00	0.000E+00	0.000E+00	1.976E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.976E+00
Pb-210	6.676E-02	0.000E+00	0.000E+00	0.000E+00	1.980E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.980E+01
Ra-226	1.085E-01	0.000E+00	0.000E+00	0.000E+00	3.218E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.218E+01
Sr-90	1.621E-02	0.000E+00	0.000E+00	0.000E+00	4.808E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.808E+00

\* 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+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

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p) and Fraction of Total Risk at t= 3.000E+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.
Cs-137	2.375E-06	0.0141	1.374E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.361E-09	0.0000
Pb-210	6.062E-08	0.0004	5.695E-08	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.891E-06	0.0112
Ra-226	1.633E-04	0.9709	7.119E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.844E-07	0.0023
Sr-90	4.175E-08	0.0002	1.211E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.895E-09	0.0000
Total	1.658E-04	0.9857	1.283E-07	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.284E-06	0.0136

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Cs-137	0.000E+00	0.0000	2.376E-06	0.0141								
Pb-210	0.000E+00	0.0000	2.008E-06	0.0119								
Ra-226	0.000E+00	0.0000	1.638E-04	0.9736								
Sr-90	0.000E+00	0.0000	4.977E-08	0.0003								
===== Total	0.000E+00	0.0000	1.682E-04	1.0000								

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

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of  
 Radon and its Decay Products at t= 3.000E+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 CNRSI(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
 and Fraction of Total Risk at t= 3.000E+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.
Cs-137	2.375E-06	0.0141	1.374E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.361E-09	0.0000
Ra-226	1.634E-04	0.9713	1.281E-07	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.275E-06	0.0135
Sr-90	4.175E-08	0.0002	1.211E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.895E-09	0.0000
===== Total	1.658E-04	0.9857	1.283E-07	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.284E-06	0.0136

Total Excess Cancer Risk CNRSI(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
 and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.										
Cs-137	0.000E+00	0.0000	2.376E-06	0.0141										
Ra-226	0.000E+00	0.0000	1.658E-04	0.9856										
Sr-90	0.000E+00	0.0000	4.977E-08	0.0003										
===== Total	0.000E+00	0.0000	1.682E-04	1.0000										

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

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	
Cs-137	1.318E-03	0.000E+00	0.000E+00	0.000E+00	3.910E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.910E-01
Pb-210	8.792E-02	0.000E+00	0.000E+00	0.000E+00	2.607E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.607E+01
Ra-226	8.915E-02	0.000E+00	0.000E+00	0.000E+00	2.644E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.644E+01
Sr-90	2.082E-03	0.000E+00	0.000E+00	0.000E+00	6.175E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.175E-01

\* 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= 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

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.
Cs-137	4.700E-07	0.0034	2.719E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.693E-10	0.0000
Pb-210	6.779E-08	0.0005	6.369E-08	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.115E-06	0.0154
Ra-226	1.342E-04	0.9774	5.849E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.158E-07	0.0023
Sr-90	5.362E-09	0.0000	1.555E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.014E-09	0.0000
Total	1.347E-04	0.9814	1.222E-07	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.432E-06	0.0177

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.								
Cs-137	0.000E+00	0.0000	4.703E-07	0.0034								
Pb-210	0.000E+00	0.0000	2.246E-06	0.0164								
Ra-226	0.000E+00	0.0000	1.346E-04	0.9802								
Sr-90	0.000E+00	0.0000	6.392E-09	0.0000								
===== Total	0.000E+00	0.0000	1.373E-04	1.0000								

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

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 CNRSI(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
 and Fraction of Total Risk at t= 1.000E+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.
Cs-137	4.700E-07	0.0034	2.719E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.693E-10	0.0000
Ra-226	1.343E-04	0.9779	1.222E-07	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.430E-06	0.0177
Sr-90	5.362E-09	0.0000	1.555E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.014E-09	0.0000
===== Total	1.347E-04	0.9814	1.222E-07	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.432E-06	0.0177

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	4.703E-07	0.0034										
Ra-226	0.000E+00	0.0000	1.368E-04	0.9965										
Sr-90	0.000E+00	0.0000	6.392E-09	0.0000										
===== Total	0.000E+00	0.0000	1.373E-04	1.0000										

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

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	
Cs-137	1.288E-05	0.000E+00	0.000E+00	0.000E+00	3.821E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.821E-03
Pb-210	5.279E-02	0.000E+00	0.000E+00	0.000E+00	1.565E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.565E+01
Ra-226	5.085E-02	0.000E+00	0.000E+00	0.000E+00	1.508E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.508E+01
Sr-90	5.914E-06	0.000E+00	0.000E+00	0.000E+00	1.754E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.754E-03

\* 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+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

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.
Cs-137	4.593E-09	0.0001	2.657E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.632E-12	0.0000
Pb-210	4.011E-08	0.0005	3.768E-08	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.251E-06	0.0160
Ra-226	7.655E-05	0.9802	3.337E-08	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.802E-07	0.0023
Sr-90	1.523E-11	0.0000	4.417E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.880E-12	0.0000
Total	7.659E-05	0.9808	7.105E-08	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.431E-06	0.0183

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.								
Cs-137	0.000E+00	0.0000	4.595E-09	0.0001								
Pb-210	0.000E+00	0.0000	1.329E-06	0.0170								
Ra-226	0.000E+00	0.0000	7.676E-05	0.9829								
Sr-90	0.000E+00	0.0000	1.815E-11	0.0000								
===== Total	0.000E+00	0.0000	7.810E-05	1.0000								

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

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 CNRSI(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
 and Fraction of Total Risk at t= 3.000E+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.
Cs-137	4.593E-09	0.0001	2.657E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.632E-12	0.0000
Ra-226	7.659E-05	0.9807	7.105E-08	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.431E-06	0.0183
Sr-90	1.523E-11	0.0000	4.417E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.880E-12	0.0000
===== Total	7.659E-05	0.9808	7.105E-08	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.431E-06	0.0183

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	4.595E-09	0.0001										
Ra-226	0.000E+00	0.0000	7.809E-05	0.9999										
Sr-90	0.000E+00	0.0000	1.815E-11	0.0000										
===== Total	0.000E+00	0.0000	7.810E-05	1.0000										

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

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	
Cs-137	1.189E-12	0.000E+00	0.000E+00	0.000E+00	3.525E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.525E-10
Pb-210	7.401E-03	0.000E+00	0.000E+00	0.000E+00	2.195E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.195E+00
Ra-226	7.128E-03	0.000E+00	0.000E+00	0.000E+00	2.114E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.114E+00
Sr-90	7.221E-15	0.000E+00	0.000E+00	0.000E+00	2.141E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.141E-12

\* 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= 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

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.
Cs-137	4.237E-16	0.0000	2.451E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.428E-19	0.0000
Pb-210	5.623E-09	0.0005	5.283E-09	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.754E-07	0.0160
Ra-226	1.073E-05	0.9802	4.677E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.525E-08	0.0023
Sr-90	1.860E-20	0.0000	5.393E-23	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.517E-21	0.0000
Total	1.074E-05	0.9808	9.960E-09	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.006E-07	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**	
	risk	fract.	risk	fract.								
Cs-137	0.000E+00	0.0000	4.239E-16	0.0000								
Pb-210	0.000E+00	0.0000	1.863E-07	0.0170								
Ra-226	0.000E+00	0.0000	1.076E-05	0.9830								
Sr-90	0.000E+00	0.0000	2.217E-20	0.0000								
===== Total	0.000E+00	0.0000	1.095E-05	1.0000								

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

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 CNRSI(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	fract.
Cs-137	4.237E-16	0.0000	2.451E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.428E-19	0.0000
Ra-226	1.074E-05	0.9808	9.960E-09	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.006E-07	0.0183
Sr-90	1.860E-20	0.0000	5.393E-23	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.517E-21	0.0000
===== Total	1.074E-05	0.9808	9.960E-09	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.006E-07	0.0183

Total Excess Cancer Risk CNRSI(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.										
Cs-137	0.000E+00	0.0000	4.239E-16	0.0000										
Ra-226	0.000E+00	0.0000	1.095E-05	1.0000										
Sr-90	0.000E+00	0.0000	2.217E-20	0.0000										
===== Total	0.000E+00	0.0000	1.095E-05	1.0000										

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

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldgs 203, 205, and 214.bld

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Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldgs 203, 205, and 214.bld

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RESRAD-BUILD Input Parameters

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Number of Sources : 1  
Number of Receptors: 1  
Total Time : 3.650000E+02 days  
Fraction Inside : 5.000000E-01

===== Receptor Information =====

Receptor	Room	x	y	z	FracTime	Inhalation	Ingestion(Dust)
		[m]	[m]	[m]		[m3/day]	[m2/hr]
1	1	5.000	5.000	1.000	1.000	1.80E+01	1.00E-04

===== Receptor-Source Shielding Relationship =====

Receptor	Source	Density	Thickness	Material
		[g/cm3]	[cm]	
1	1	2.40E+00	0.00E+00	Concrete

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldgs 203, 205, and 214.bld

==== Building Information ====

Building Air Exchange Rate: 8.00E-01 1/hr

Height [m]	Air Exchanges [m3/hr]
Area [m2]	*****
	* * *
	* * *
	* * * <=Q01: 2.00E+02
H1: 2.500	* Room 1 * Q10 : 2.00E+02
	* LAMBDA: 8.00E-01 * *
Area 100.000	* * *
	* * *
	*****

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldgs 203, 205, and 214.bld

==== Source Information =====

Source: 1

Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00[m]  
 Geometry:: Type: Area Area:1.00E+02 [m2] Direction: z  
 Pathway ::  
     Direct Ingestion Rate: 0.000E+00 [1/hr]  
     Fraction released to air: 1.000E-01  
     Removable fraction: 5.000E-01  
     Time to Remove: 3.650E+02 [day]  
  
     Radon Release Fraction: 1.000E-01

Contamination::

Nuclide Concentration Dose Conversion Factor (Library: FGR 13 Morbidity)

		Ingestion	Inhalation	Submersion
	[dpm/m2]	[mrem/dpm]	[mrem/dpm]	[mrem/yr/ (dpm/m3)]
PU-239	2.500E+03	1.595E-03	1.932E-01	2.231E-07
U-235	0.000E+00	1.204E-04	5.541E-02	4.063E-04
PA-231	0.000E+00	4.775E-03	5.766E-01	9.049E-05
AC-227	0.000E+00	6.665E-03	3.029E+00	9.734E-04
RA-226	2.500E+03	5.950E-04	3.871E-03	4.663E-03
PB-210	0.000E+00	2.422E-03	6.214E-03	4.698E-06
CS-137	1.250E+05	2.252E-05	1.437E-05	1.434E-03
SR-90	2.500E+04	6.883E-05	5.894E-04	1.039E-05

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldgs 203, 205, and 214.bld

Evaluation Time: 0.0000000E+00 years

```
=====
=====
=====
Assessment for Time: 1
Time =0.00E+00 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00 [m]

Geometry:: Type: Area Area:1.00E+02 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	PU-239	2.500E+03
	U-235	0.000E+00
	PA-231	0.000E+00
	AC-227	0.000E+00
	RA-226	2.500E+03
	PB-210	0.000E+00
	CS-137	1.250E+05
	SR-90	2.500E+04

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldgs 203, 205, and 214.bld

Evaluation Time: 0.0000000E+00 years

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RESRAD-BUILD Dose Tables

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Source Contributions to Receptor Doses

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[mrem]

	Source	Total
	1	
Receptor 1	5.43E+00	5.43E+00
Total	5.43E+00	5.43E+00

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldgs 203, 205, and 214.bld

Evaluation Time: 0.0000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	4.77E-01	3.46E-02	2.58E-04	4.67E+00	2.66E-03	2.43E-01
Total	4.77E-01	3.46E-02	2.58E-04	4.67E+00	2.66E-03	2.43E-01

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldgs 203, 205, and 214.bld

Evaluation Time: 0.0000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
PU-239	4.53E+00	4.53E+00
U-235	6.17E-10	6.17E-10
PA-231	4.49E-14	4.49E-14
AC-227	1.73E-15	1.73E-15
RA-226	1.57E-01	1.57E-01
PB-210	4.22E-03	4.22E-03
CS-137	5.64E-01	5.64E-01
SR-90	1.72E-01	1.72E-01

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldgs 203, 205, and 214.bld

Evaluation Time: 1.00000000 years

```
=====
=====
=====
Assessment for Time: 2
Time =1.00E+00 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00 [m]

Geometry:: Type: Area Area:1.00E+02 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	PU-239	1.250E+03
	U-235	1.231E-06
	PA-231	1.300E-11
	AC-227	1.367E-13
	RA-226	1.249E+03
	PB-210	3.825E+01
	CS-137	6.107E+04
	SR-90	1.221E+04

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldgs 203, 205, and 214.bld

Evaluation Time: 1.00000000 years

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RESRAD-BUILD Dose Tables

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Source Contributions to Receptor Doses

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[mrem]

	Source	Total
	1	
Receptor 1	3.12E-01	3.12E-01
Total	3.12E-01	3.12E-01

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldgs 203, 205, and 214.bld

Evaluation Time: 1.00000000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	3.11E-01	0.00E+00	0.00E+00	0.00E+00	1.77E-03	0.00E+00
Total	3.11E-01	0.00E+00	0.00E+00	0.00E+00	1.77E-03	0.00E+00

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldgs 203, 205, and 214.bld

Evaluation Time: 1.00000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
PU-239	1.14E-05	1.14E-05
U-235	2.81E-12	2.81E-12
PA-231	1.26E-17	1.26E-17
AC-227	1.74E-18	1.74E-18
RA-226	1.98E-02	1.98E-02
PB-210	2.99E-06	2.99E-06
CS-137	2.92E-01	2.92E-01
SR-90	5.91E-04	5.91E-04

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldgs 203, 205, and 214.bld

Full Summary

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RESRAD-BUILD Dose (Time) Tables

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Receptor Dose Received for the Exposure Duration

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(mrem)

Evaluation Time [yr]

0.00E+00 1.00E+00

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---

1 5.43E+00 3.12E-01

Receptor Dose/Yr Averaged Over Exposure Duration

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(mrem/yr)

Evaluation Time [yr]

0.00E+00 1.00E+00

---

---

1 5.43E+00 3.13E-01

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldgs 203, 205, and 214.bld

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Risk by Pathway Detail.....	11
Risk by Nuclide Detail.....	12

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldgs 203, 205, and 214.bld

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=====

RESRAD-BUILD Input Parameters

=====

=====

Number of Sources : 1  
Number of Receptors: 1  
Total Time : 3.650000E+02 days  
Fraction Inside : 5.000000E-01

===== Receptor Information =====

Receptor	Room	x	y	z	FracTime	Inhalation	Ingestion(Dust)
		[m]	[m]	[m]		[m3/day]	[m2/hr]
1	1	5.000	5.000	1.000	1.000	1.80E+01	1.00E-04

===== Receptor-Source Shielding Relationship =====

Receptor	Source	Density	Thickness	Material
		[g/cm3]	[cm]	
1	1	2.40E+00	0.00E+00	Concrete

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldgs 203, 205, and 214.bld

==== Building Information =====

Building Air Exchange Rate: 8.00E-01 1/hr

Height [m]	Area [m2]	Air Exchanges [m3/hr]
		*****
		* * *
		* * *
		* * *
H1: 2.500		* Room 1 * Q10 : 2.00E+02
		* LAMBDA: 8.00E-01 * <=Q01: 2.00E+02
Area 100.000		* * *
		* * *
		*****

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldgs 203, 205, and 214.bld

==== Source Information =====

Source: 1

Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00[m]

Geometry:: Type: Area Area:1.00E+02 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Radon Release Fraction: 1.000E-01

Contamination::

	Nuclide Concentration	Slope Factor	
		Ingestion	Inhalation
	[dpm/m2]	[Risk/dpm]	[Risk/dpm]
PU-239	2.500E+03	7.838E-11	2.482E-08
U-235	0.000E+00	4.398E-11	1.126E-08
PA-231	0.000E+00	1.018E-10	3.432E-08
AC-227	0.000E+00	2.941E-10	9.588E-08
RA-226	2.500E+03	2.319E-10	1.273E-08
PB-210	0.000E+00	5.374E-10	7.322E-09
CS-137	1.250E+05	1.685E-11	5.045E-11
SR-90	2.500E+04	4.293E-11	1.952E-10

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldgs 203, 205, and 214.bld

Evaluation Time: 0.0000000E+00 years

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=====
=====
Assessment for Time: 1
Time =0.00E+00 yr
=====
=====
```

=====  
Source Information  
=====

Source: 1

Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00 [m]  
Geometry:: Type: Area Area:1.00E+02 [m2] Direction: z  
Pathway ::  
Direct Ingestion Rate: 0.000E+00 [1/hr]  
Fraction released to air: 1.000E-01  
Removable fraction: 5.000E-01  
Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	PU-239	2.500E+03
	U-235	0.000E+00
	PA-231	0.000E+00
	AC-227	0.000E+00
	RA-226	2.500E+03
	PB-210	0.000E+00
	CS-137	1.250E+05
	SR-90	2.500E+04

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldgs 203, 205, and 214.bld

Evaluation Time: 0.0000000E+00 years

---

---

RESRAD-BUILD Risk Tables

---

---

Source Contributions to Receptor Risks

---

[Risk]

	Source	Total
	1	
Receptor 1	1.44E-06	1.44E-06
Total	1.44E-06	1.44E-06

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldgs 203, 205, and 214.bld

Evaluation Time: 0.00000000E+00 years

Pathway Detail of Risks

---

---

[Risk]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	3.56E-07	2.58E-08	1.93E-10	9.63E-07	3.16E-09	9.43E-08
Total	3.56E-07	2.58E-08	1.93E-10	9.63E-07	3.16E-09	9.43E-08

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldgs 203, 205, and 214.bld

Evaluation Time: 0.0000000E+00 years

Nuclide Detail of Risks

[Risk]

Source: 1

Nuclide	Receptor	Total
	1	
PU-239	5.74E-07	5.74E-07
U-235	1.27E-16	1.27E-16
PA-231	2.64E-21	2.64E-21
AC-227	5.49E-23	5.49E-23
RA-226	3.31E-07	3.31E-07
PB-210	2.92E-09	2.92E-09
CS-137	4.64E-07	4.64E-07
SR-90	6.91E-08	6.91E-08

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldgs 203, 205, and 214.bld

Evaluation Time: 1.00000000 years

```
=====
=====
=====
Assessment for Time: 2
Time =1.00E+00 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00 [m]  
Geometry:: Type: Area Area:1.00E+02 [m2] Direction: z  
Pathway ::  
Direct Ingestion Rate: 0.000E+00 [1/hr]  
Fraction released to air: 1.000E-01  
Removable fraction: 0.000E+00  
Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	PU-239	1.250E+03
	U-235	1.231E-06
	PA-231	1.300E-11
	AC-227	1.367E-13
	RA-226	1.249E+03
	PB-210	3.825E+01
	CS-137	6.107E+04
	SR-90	1.221E+04

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldgs 203, 205, and 214.bld

Evaluation Time: 1.00000000 years

---

---

RESRAD-BUILD Risk Tables

---

---

Source Contributions to Receptor Risks

---

[Risk]

	Source	Total
	1	
Receptor 1	2.34E-07	2.34E-07
Total	2.34E-07	2.34E-07

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldgs 203, 205, and 214.bld

Evaluation Time: 1.00000000 years

Pathway Detail of Risks

[Risk]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	2.32E-07	0.00E+00	0.00E+00	0.00E+00	2.11E-09	0.00E+00
Total	2.32E-07	0.00E+00	0.00E+00	0.00E+00	2.11E-09	0.00E+00

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldgs 203, 205, and 214.bld

Evaluation Time: 1.00000000 years

Nuclide Detail of Risks

[Risk]

Source: 1

Nuclide	Receptor	Total
	1	
PU-239	7.72E-12	7.72E-12
U-235	2.01E-18	2.01E-18
PA-231	9.16E-24	9.16E-24
AC-227	1.27E-24	1.27E-24
RA-226	1.57E-08	1.57E-08
PB-210	2.05E-12	2.05E-12
CS-137	2.18E-07	2.18E-07
SR-90	4.70E-10	4.70E-10

Title : Parcel C Building 211

Input File : C:\RESRAD\_Family\BUILD\Bldg 211.bld

---

---

RESRAD-BUILD Table of Contents

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For time = 1.00E+00 yr

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Full Summary..... 13

Title : Parcel C Building 211

Input File : C:\RESRAD\_Family\BUILD\Bldg 211.bld

=====

=====

=====

RESRAD-BUILD Input Parameters

=====

=====

Number of Sources : 1  
Number of Receptors: 1  
Total Time : 3.650000E+02 days  
Fraction Inside : 5.000000E-01

===== Receptor Information =====

Receptor	Room	x	y	z	FracTime	Inhalation	Ingestion(Dust)
		[m]	[m]	[m]		[m3/day]	[m2/hr]
1	1	5.000	5.000	1.000	1.000	1.80E+01	1.00E-04

===== Receptor-Source Shielding Relationship =====

Receptor	Source	Density	Thickness	Material
		[g/cm3]	[cm]	
1	1	2.40E+00	0.00E+00	Concrete

Title : Parcel C Building 211

Input File : C:\RESRAD\_Family\BUILD\Bldg 211.bld

==== Building Information =====

Building Air Exchange Rate: 8.00E-01 1/hr

Height [m]	Area [m2]	Air Exchanges [m3/hr]
		*****
		* * *
		* * *
		* * *
		<=Q01: 2.00E+02
H1: 2.500		* Room 1 * Q10 : 2.00E+02
		* LAMBDA: 8.00E-01 *
Area 100.000		* * *
		* * *
		*****

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

Title : Parcel C Building 211

Input File : C:\RESRAD\_Family\BUILD\Bldg 211.bld

==== Source Information =====

Source: 1

Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00[m]

Geometry:: Type: Area Length[m]:1.00E+01 Width[m]:1.00E+01 Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Radon Release Fraction: 1.000E-01

Contamination::

Nuclide Concentration Dose Conversion Factor (Library: FGR 11)

	[dpm/m2]	Dose Conversion Factor (Library: FGR 11)		
		Ingestion [mrem/dpm]	Inhalation [mrem/dpm]	Submersion [mrem/yr/ (dpm/m3)]
TH-232	1.220E+03	1.230E-03	7.387E-01	4.588E-07
TH-228	0.000E+00	3.642E-04	1.556E-01	4.224E-03
RA-228	0.000E+00	6.496E-04	2.287E-03	2.515E-03
RA-226	3.330E+03	5.950E-04	3.871E-03	4.663E-03
PB-210	0.000E+00	2.422E-03	6.214E-03	4.698E-06
CS-137	1.670E+05	2.252E-05	1.437E-05	1.434E-03

Title : Parcel C Building 211

Input File : C:\RESRAD\_Family\BUILD\Bldg 211.bld

Evaluation Time: 0.0000000E+00 years

```
=====
=====
=====
Assessment for Time: 1
Time =0.00E+00 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00 [m]

Geometry:: Type: Area Length[m]:1.00E+01 Width[m]:1.00E+01 Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	TH-232	1.220E+03
	TH-228	0.000E+00
	RA-228	0.000E+00
	RA-226	3.330E+03
	PB-210	0.000E+00
	CS-137	1.670E+05

Title : Parcel C Building 211

Input File : C:\RESRAD\_Family\BUILD\Bldg 211.bld

Evaluation Time: 0.0000000E+00 years

---

---

RESRAD-BUILD Dose Tables

---

---

Source Contributions to Receptor Doses

---

[mrem]

	Source	Total
	1	
Receptor 1	9.28E+00	9.28E+00
Total	9.28E+00	9.28E+00

Title : Parcel C Building 211

Input File : C:\RESRAD\_Family\BUILD\Bldg 211.bld

Evaluation Time: 0.0000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	6.32E-01	4.59E-02	3.45E-04	8.42E+00	3.65E-03	1.78E-01
Total	6.32E-01	4.59E-02	3.45E-04	8.42E+00	3.65E-03	1.78E-01

Title : Parcel C Building 211

Input File : C:\RESRAD\_Family\BUILD\Bldg 211.bld

Evaluation Time: 0.0000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
TH-232	8.31E+00	8.31E+00
RA-228		
TH-228	7.91E-03	7.91E-03
RA-226	2.09E-01	2.09E-01
PB-210	5.63E-03	5.63E-03
CS-137	7.49E-01	7.49E-01

Title : Parcel C Building 211

Input File : C:\RESRAD\_Family\BUILD\Bldg 211.bld

Evaluation Time: 1.00000000 years

```
=====
=====
=====
Assessment for Time: 2
Time =1.00E+00 yr
=====
=====
```

==== Source Information =====

Source: 1

Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00 [m]  
Geometry:: Type: Area Length[m]:1.00E+01 Width[m]:1.00E+01 Direction: z  
Pathway ::  
Direct Ingestion Rate: 0.000E+00 [1/hr]  
Fraction released to air: 1.000E-01  
Removable fraction: 0.000E+00  
Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	TH-232	6.100E+02
	TH-228	1.139E+01
	RA-228	6.927E+01
	RA-226	1.664E+03
	PB-210	5.095E+01
	CS-137	8.159E+04

Title : Parcel C Building 211

Input File : C:\RESRAD\_Family\BUILD\Bldg 211.bld

Evaluation Time: 1.00000000 years

---

---

RESRAD-BUILD Dose Tables

---

---

Source Contributions to Receptor Doses

---

[mrem]

	Source	Total
	1	
Receptor 1	4.16E-01	4.16E-01
Total	4.16E-01	4.16E-01

Title : Parcel C Building 211

Input File : C:\RESRAD\_Family\BUILD\Bldg 211.bld

Evaluation Time: 1.00000000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	4.13E-01	0.00E+00	0.00E+00	0.00E+00	2.86E-03	0.00E+00
Total	4.13E-01	0.00E+00	0.00E+00	0.00E+00	2.86E-03	0.00E+00

Title : Parcel C Building 211

Input File : C:\RESRAD\_Family\BUILD\Bldg 211.bld

Evaluation Time: 1.00000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
TH-232	6.10E-06	6.10E-06
RA-228		
TH-228	7.86E-04	7.86E-04
RA-226	2.62E-02	2.62E-02
PB-210	3.96E-06	3.96E-06
CS-137	3.88E-01	3.88E-01

Title : Parcel C Building 211

Input File : C:\RESRAD\_Family\BUILD\Bldg 211.bld

Full Summary

---

---

RESRAD-BUILD Dose (Time) Tables

---

---

Receptor Dose Received for the Exposure Duration

---

---

(mrem)

Evaluation Time [yr]

0.00E+00 1.00E+00

---

---

1 9.28E+00 4.16E-01

Receptor Dose/Yr Averaged Over Exposure Duration

---

---

(mrem/yr)

Evaluation Time [yr]

0.00E+00 1.00E+00

---

---

1 9.29E+00 4.16E-01

Title : Parcel C Building 211

Input File : C:\RESRAD\_Family\BUILD\Bldg 211.bld

---

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RESRAD-BUILD Table of Contents

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Risk by Pathway Detail.....	11
Risk by Nuclide Detail.....	12

Title : Parcel C Building 211

Input File : C:\RESRAD\_Family\BUILD\Bldg 211.bld

=====

=====

=====

RESRAD-BUILD Input Parameters

=====

=====

Number of Sources : 1  
Number of Receptors: 1  
Total Time : 3.650000E+02 days  
Fraction Inside : 5.000000E-01

===== Receptor Information =====

Receptor	Room	x	y	z	FracTime	Inhalation	Ingestion(Dust)
		[m]	[m]	[m]		[m3/day]	[m2/hr]
1	1	5.000	5.000	1.000	1.000	1.80E+01	1.00E-04

===== Receptor-Source Shielding Relationship =====

Receptor	Source	Density	Thickness	Material
		[g/cm3]	[cm]	
1	1	2.40E+00	0.00E+00	Concrete

Title : Parcel C Building 211

Input File : C:\RESRAD\_Family\BUILD\Bldg 211.bld

==== Building Information ====

Building Air Exchange Rate: 8.00E-01 1/hr

Height [m]	Air Exchanges [m3/hr]
Area [m2]	*****
	* * * * *
	* * * * *
	* * * * *
H1: 2.500	* Room 1 * Q10 : 2.00E+02
	* LAMBDA: 8.00E-01 * <=Q01: 2.00E+02
Area 100.000	* * * * *
	* * * * *
	*****

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

Title : Parcel C Building 211

Input File : C:\RESRAD\_Family\BUILD\Bldg 211.bld

==== Source Information =====

Source: 1

Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00[m]

Geometry:: Type: Area Length[m]:1.00E+01 Width[m]:1.00E+01 Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Radon Release Fraction: 1.000E-01

Contamination::

	Nuclide Concentration	Slope Factor	
		Ingestion	Inhalation
	[dpm/m2]	[Risk/dpm]	[Risk/dpm]
TH-232	1.220E+03	5.991E-11	1.950E-08
TH-228	0.000E+00	1.903E-10	6.488E-08
RA-228	0.000E+00	6.454E-10	1.971E-08
RA-226	3.330E+03	2.319E-10	1.273E-08
PB-210	0.000E+00	5.374E-10	7.322E-09
CS-137	1.670E+05	1.685E-11	5.045E-11

Title : Parcel C Building 211

Input File : C:\RESRAD\_Family\BUILD\Bldg 211.bld

Evaluation Time: 0.0000000E+00 years

```
=====
=====
=====
Assessment for Time: 1
Time =0.00E+00 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00 [m]

Geometry:: Type: Area Length[m]:1.00E+01 Width[m]:1.00E+01 Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	TH-232	1.220E+03
	TH-228	0.000E+00
	RA-228	0.000E+00
	RA-226	3.330E+03
	PB-210	0.000E+00
	CS-137	1.670E+05

Title : Parcel C Building 211

Input File : C:\RESRAD\_Family\BUILD\Bldg 211.bld

Evaluation Time: 0.0000000E+00 years

---

---

RESRAD-BUILD Risk Tables

---

---

Source Contributions to Receptor Risks

---

[Risk]

	Source	Total
	1	
Receptor 1	1.30E-06	1.30E-06
Total	1.30E-06	1.30E-06

Title : Parcel C Building 211

Input File : C:\RESRAD\_Family\BUILD\Bldg 211.bld

Evaluation Time: 0.0000000E+00 years

Pathway Detail of Risks

[Risk]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	4.72E-07	3.42E-08	2.57E-10	6.99E-07	4.29E-09	8.85E-08
Total	4.72E-07	3.42E-08	2.57E-10	6.99E-07	4.29E-09	8.85E-08

Title : Parcel C Building 211

Input File : C:\RESRAD\_Family\BUILD\Bldg 211.bld

Evaluation Time: 0.0000000E+00 years

Nuclide Detail of Risks

[Risk]

Source: 1

Nuclide	Receptor	Total
	1	
TH-232	2.20E-07	2.20E-07
RA-228		
TH-228	3.37E-09	3.37E-09
RA-226	4.41E-07	4.41E-07
PB-210	3.89E-09	3.89E-09
CS-137	6.17E-07	6.17E-07

Title : Parcel C Building 211

Input File : C:\RESRAD\_Family\BUILD\Bldg 211.bld

Evaluation Time: 1.00000000 years

```
=====
=====
=====
Assessment for Time: 2
Time =1.00E+00 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00 [m]

Geometry:: Type: Area Length[m]:1.00E+01 Width[m]:1.00E+01 Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	TH-232	6.100E+02
	TH-228	1.139E+01
	RA-228	6.927E+01
	RA-226	1.664E+03
	PB-210	5.095E+01
	CS-137	8.159E+04

Title : Parcel C Building 211

Input File : C:\RESRAD\_Family\BUILD\Bldg 211.bld

Evaluation Time: 1.00000000 years

---

---

RESRAD-BUILD Risk Tables

---

---

Source Contributions to Receptor Risks

---

[Risk]

	Source	Total
	1	
Receptor 1	3.11E-07	3.11E-07
Total	3.11E-07	3.11E-07

Title : Parcel C Building 211

Input File : C:\RESRAD\_Family\BUILD\Bldg 211.bld

Evaluation Time: 1.00000000 years

Pathway Detail of Risks

[Risk]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	3.08E-07	0.00E+00	0.00E+00	0.00E+00	3.22E-09	0.00E+00
Total	3.08E-07	0.00E+00	0.00E+00	0.00E+00	3.22E-09	0.00E+00

Title : Parcel C Building 211

Input File : C:\RESRAD\_Family\BUILD\Bldg 211.bld

Evaluation Time: 1.00000000 years

Nuclide Detail of Risks

[Risk]

Source: 1

Nuclide	Receptor	Total
	1	
TH-232	4.01E-12	4.01E-12
RA-228		
TH-228	6.33E-10	6.33E-10
RA-226	2.09E-08	2.09E-08
PB-210	2.72E-12	2.72E-12
CS-137	2.89E-07	2.89E-07

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 224.bld

---

---

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For time = 1.00E+00 yr	
Time Specific Parameters.....	9
Receptor-Source Dose Summary.....	10
Dose by Pathway Detail.....	11
Dose by Nuclide Detail.....	12
Full Summary.....	13

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 224.bld

=====

=====

=====

RESRAD-BUILD Input Parameters

=====

=====

Number of Sources : 1  
Number of Receptors: 1  
Total Time : 3.650000E+02 days  
Fraction Inside : 5.000000E-01

===== Receptor Information =====

Receptor	Room	x	y	z	FracTime	Inhalation	Ingestion(Dust)
		[m]	[m]	[m]		[m3/day]	[m2/hr]
1	1	5.000	5.000	1.000	1.000	1.80E+01	1.00E-04

===== Receptor-Source Shielding Relationship =====

Receptor	Source	Density	Thickness	Material
		[g/cm3]	[cm]	
1	1	2.40E+00	0.00E+00	Concrete

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 224.bld

==== Building Information =====

Building Air Exchange Rate: 8.00E-01 1/hr

Height [m]	Area [m2]	Air Exchanges [m3/hr]
		*****
		* * *
		* * *
		* * *
H1: 2.500		<=Q01: 2.00E+02
		* Room 1 * Q10 : 2.00E+02
		* LAMBDA: 8.00E-01 *
Area 100.000		* * *
		* * *
		*****

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 224.bld

==== Source Information =====

Source: 1

Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00[m]

Geometry:: Type: Area Area:1.00E+02 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::

Nuclide Concentration Dose Conversion Factor (Library: FGR 13 Morbidity)

	[dpm/m2]	Dose Conversion Factor		
		Ingestion [mrem/dpm]	Inhalation [mrem/dpm]	Submersion [mrem/yr/ (dpm/m3)]
PU-239	3.330E+03	1.595E-03	1.932E-01	2.231E-07
U-235	0.000E+00	1.204E-04	5.541E-02	4.063E-04
PA-231	0.000E+00	4.775E-03	5.766E-01	9.049E-05
AC-227	0.000E+00	6.665E-03	3.029E+00	9.734E-04
CS-137	1.670E+05	2.252E-05	1.437E-05	1.434E-03
SR-90	3.330E+04	6.883E-05	5.894E-04	1.039E-05

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 224.bld

Evaluation Time: 0.0000000E+00 years

```
=====
=====
=====
Assessment for Time: 1
Time =0.00E+00 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00 [m]

Geometry:: Type: Area Area:1.00E+02 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	PU-239	3.330E+03
	U-235	0.000E+00
	PA-231	0.000E+00
	AC-227	0.000E+00
	CS-137	1.670E+05
	SR-90	3.330E+04

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 224.bld

Evaluation Time: 0.0000000E+00 years

---

---

RESRAD-BUILD Dose Tables

---

---

Source Contributions to Receptor Doses

---

[mrem]

	Source	Total
	1	
Receptor 1	7.02E+00	7.02E+00
Total	7.02E+00	7.02E+00

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 224.bld

Evaluation Time: 0.0000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	6.01E-01	4.35E-02	3.23E-04	6.10E+00	0.00E+00	2.72E-01
Total	6.01E-01	4.35E-02	3.23E-04	6.10E+00	0.00E+00	2.72E-01

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 224.bld

Evaluation Time: 0.0000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
PU-239	6.04E+00	6.04E+00
U-235	8.22E-10	8.22E-10
PA-231	5.98E-14	5.98E-14
AC-227	2.30E-15	2.30E-15
CS-137	7.53E-01	7.53E-01
SR-90	2.29E-01	2.29E-01

Title : Default Case for RESRAD-BUILD  
Input File : C:\RESRAD\_Family\BUILD\Bldg 224.bld  
Evaluation Time: 1.00000000 years

```
=====
=====
=====
Assessment for Time: 2
Time =1.00E+00 yr
=====
=====
```

=====  
Source Information  
=====

Source: 1  
Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00 [m]  
Geometry:: Type: Area Area:1.00E+02 [m2] Direction: z  
Pathway ::  
Direct Ingestion Rate: 0.000E+00 [1/hr]  
Fraction released to air: 1.000E-01  
Removable fraction: 0.000E+00  
Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	PU-239	1.665E+03
	U-235	1.639E-06
	PA-231	1.732E-11
	AC-227	1.821E-13
	CS-137	8.159E+04
	SR-90	1.626E+04

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 224.bld

Evaluation Time: 1.00000000 years

---

---

RESRAD-BUILD Dose Tables

---

---

Source Contributions to Receptor Doses

---

[mrem]

	Source	Total
	1	
Receptor 1	3.91E-01	3.91E-01
Total	3.91E-01	3.91E-01

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 224.bld

Evaluation Time: 1.00000000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	3.91E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	3.91E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 224.bld

Evaluation Time: 1.00000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
PU-239	1.52E-05	1.52E-05
U-235	3.74E-12	3.74E-12
PA-231	1.68E-17	1.68E-17
AC-227	2.32E-18	2.32E-18
CS-137	3.90E-01	3.90E-01
SR-90	7.87E-04	7.87E-04

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 224.bld

Full Summary

---

---

RESRAD-BUILD Dose (Time) Tables

---

---

Receptor Dose Received for the Exposure Duration

---

---

(mrem)

Evaluation Time [yr]

0.00E+00 1.00E+00

---

---

1 7.02E+00 3.91E-01

Receptor Dose/Yr Averaged Over Exposure Duration

---

---

(mrem/yr)

Evaluation Time [yr]

0.00E+00 1.00E+00

---

---

1 7.02E+00 3.91E-01

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 224.bld

---

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RESRAD-BUILD Table of Contents

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Receptor-Source Risk Summary.....	10
Risk by Pathway Detail.....	11
Risk by Nuclide Detail.....	12

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 224.bld

=====

=====

=====

RESRAD-BUILD Input Parameters

=====

=====

Number of Sources : 1  
Number of Receptors: 1  
Total Time : 3.650000E+02 days  
Fraction Inside : 5.000000E-01

===== Receptor Information =====

Receptor	Room	x	y	z	FracTime	Inhalation	Ingestion(Dust)
		[m]	[m]	[m]		[m3/day]	[m2/hr]
1	1	5.000	5.000	1.000	1.000	1.80E+01	1.00E-04

===== Receptor-Source Shielding Relationship =====

Receptor	Source	Density	Thickness	Material
		[g/cm3]	[cm]	
1	1	2.40E+00	0.00E+00	Concrete

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 224.bld

==== Building Information ====

Building Air Exchange Rate: 8.00E-01 1/hr

Height [m]	Air Exchanges [m3/hr]
Area [m2]	
	*****
	* * *
	* * *
	* * *
H1: 2.500	* Room 1 * Q10 : 2.00E+02
	* LAMBDA: 8.00E-01 * <=Q01: 2.00E+02
Area 100.000	* * *
	* * *
	*****

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 224.bld

==== Source Information =====

Source: 1

Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00[m]

Geometry:: Type: Area Area:1.00E+02 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::

Nuclide	Concentration [dpm/m2]	Slope Factor	
		Ingestion [Risk/dpm]	Inhalation [Risk/dpm]
PU-239	3.330E+03	7.838E-11	2.482E-08
U-235	0.000E+00	4.398E-11	1.126E-08
PA-231	0.000E+00	1.018E-10	3.432E-08
AC-227	0.000E+00	2.941E-10	9.588E-08
CS-137	1.670E+05	1.685E-11	5.045E-11
SR-90	3.330E+04	4.293E-11	1.952E-10

Title : Default Case for RESRAD-BUILD  
Input File : C:\RESRAD\_Family\BUILD\Bldg 224.bld  
Evaluation Time: 0.0000000E+00 years

=====  
=====  
=====  
Assessment for Time: 1  
Time =0.00E+00 yr  
=====  
=====  
=====

=====  
Source Information  
=====

Source: 1  
Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00 [m]  
Geometry:: Type: Area Area:1.00E+02 [m2] Direction: z  
Pathway ::  
Direct Ingestion Rate: 0.000E+00 [1/hr]  
Fraction released to air: 1.000E-01  
Removable fraction: 5.000E-01  
Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	PU-239	3.330E+03
	U-235	0.000E+00
	PA-231	0.000E+00
	AC-227	0.000E+00
	CS-137	1.670E+05
	SR-90	3.330E+04

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 224.bld

Evaluation Time: 0.0000000E+00 years

---

---

RESRAD-BUILD Risk Tables

---

---

Source Contributions to Receptor Risks

---

[Risk]

	Source	Total
	1	
Receptor 1	1.48E-06	1.48E-06
Total	1.48E-06	1.48E-06

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 224.bld

Evaluation Time: 0.00000000E+00 years

Pathway Detail of Risks

---

---

[Risk]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	4.48E-07	3.24E-08	2.41E-10	8.91E-07	0.00E+00	1.06E-07
Total	4.48E-07	3.24E-08	2.41E-10	8.91E-07	0.00E+00	1.06E-07

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 224.bld

Evaluation Time: 0.00000000E+00 years

Nuclide Detail of Risks

[Risk]

Source: 1

Nuclide	Receptor	Total
	1	
PU-239	7.65E-07	7.65E-07
U-235	1.69E-16	1.69E-16
PA-231	3.51E-21	3.51E-21
AC-227	7.32E-23	7.32E-23
CS-137	6.20E-07	6.20E-07
SR-90	9.21E-08	9.21E-08

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 224.bld

Evaluation Time: 1.00000000 years

```
=====
=====
=====
Assessment for Time: 2
Time =1.00E+00 yr
=====
=====
```

=====  
Source Information  
=====

Source: 1

Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00 [m]  
Geometry:: Type: Area Area:1.00E+02 [m2] Direction: z  
Pathway ::  
Direct Ingestion Rate: 0.000E+00 [1/hr]  
Fraction released to air: 1.000E-01  
Removable fraction: 0.000E+00  
Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	PU-239	1.665E+03
	U-235	1.639E-06
	PA-231	1.732E-11
	AC-227	1.821E-13
	CS-137	8.159E+04
	SR-90	1.626E+04

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 224.bld

Evaluation Time: 1.00000000 years

---

---

RESRAD-BUILD Risk Tables

---

---

Source Contributions to Receptor Risks

---

[Risk]

	Source	Total
	1	
Receptor 1	2.91E-07	2.91E-07
Total	2.91E-07	2.91E-07

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 224.bld

Evaluation Time: 1.00000000 years

Pathway Detail of Risks

[Risk]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	2.91E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	2.91E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 224.bld

Evaluation Time: 1.00000000 years

Nuclide Detail of Risks

[Risk]

Source: 1

Nuclide	Receptor	Total
	1	
PU-239	1.03E-11	1.03E-11
U-235	2.68E-18	2.68E-18
PA-231	1.22E-23	1.22E-23
AC-227	1.69E-24	1.69E-24
CS-137	2.91E-07	2.91E-07
SR-90	6.27E-10	6.27E-10

Title : Parcel C Building 241

Input File : C:\RESRAD\_Family\BUILD\Bldg 241.bld

---

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For time = 1.00E+00 yr	
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Dose by Nuclide Detail.....	12
Full Summary.....	13

Title : Parcel C Building 241

Input File : C:\RESRAD\_Family\BUILD\Bldg 241.bld

=====  
=====  
== RESRAD-BUILD Input Parameters ==  
=====  
=====

Number of Sources : 1  
Number of Receptors: 1  
Total Time : 3.650000E+02 days  
Fraction Inside : 5.000000E-01

==== Receptor Information =====

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.000	5.000	1.000	1.000	1.80E+01	1.00E-04

==== Receptor-Source Shielding Relationship =====

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

Title : Parcel C Building 241

Input File : C:\RESRAD\_Family\BUILD\Bldg 241.bld

==== Building Information ====

Building Air Exchange Rate: 8.00E-01 1/hr

Height [m]	Air Exchanges [m3/hr]
Area [m2]	*****
	* * *
	* * *
	* * * <=Q01: 2.00E+02
H1: 2.500	* Room 1 * Q10 : 2.00E+02
	* LAMBDA: 8.00E-01 * *
Area 100.000	* * *
	* * *
	*****

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

Title : Parcel C Building 241

Input File : C:\RESRAD\_Family\BUILD\Bldg 241.bld

==== Source Information =====

Source: 1

Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00[m]

Geometry:: Type: Area Length[m]:1.00E+01 Width[m]:1.00E+01 Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Radon Release Fraction: 1.000E-01

Contamination::

Nuclide Concentration Dose Conversion Factor (Library: FGR 11)

	[dpm/m2]	Dose Conversion Factor (Library: FGR 11)		
		Ingestion [mrem/dpm]	Inhalation [mrem/dpm]	Submersion [mrem/yr/(dpm/m3)]
TH-232	1.830E+03	1.230E-03	7.387E-01	4.588E-07
TH-228	0.000E+00	3.642E-04	1.556E-01	4.224E-03
RA-228	0.000E+00	6.496E-04	2.287E-03	2.515E-03
K-40	2.500E+05	8.378E-06	5.586E-06	4.235E-04

Title : Parcel C Building 241

Input File : C:\RESRAD\_Family\BUILD\Bldg 241.bld

Evaluation Time: 0.0000000E+00 years

```
=====
=====
=====
Assessment for Time: 1
Time =0.00E+00 yr
=====
=====
```

=====  
Source Information  
=====

Source: 1

Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00 [m]  
Geometry:: Type: Area Length[m]:1.00E+01 Width[m]:1.00E+01 Direction: z  
Pathway ::  
Direct Ingestion Rate: 0.000E+00 [1/hr]  
Fraction released to air: 1.000E-01  
Removable fraction: 5.000E-01  
Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	TH-232	1.830E+03
	TH-228	0.000E+00
	RA-228	0.000E+00
	K-40	2.500E+05

Title : Parcel C Building 241

Input File : C:\RESRAD\_Family\BUILD\Bldg 241.bld

Evaluation Time: 0.0000000E+00 years

---

---

RESRAD-BUILD Dose Tables

---

---

Source Contributions to Receptor Doses

---

[mrem]

	Source	Total
	1	
Receptor 1	1.28E+01	1.28E+01
Total	1.28E+01	1.28E+01

Title : Parcel C Building 241

Input File : C:\RESRAD\_Family\BUILD\Bldg 241.bld

Evaluation Time: 0.0000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	2.34E-01	1.74E-02	1.48E-04	1.24E+01	1.53E-04	1.08E-01
Total	2.34E-01	1.74E-02	1.48E-04	1.24E+01	1.53E-04	1.08E-01

Title : Parcel C Building 241

Input File : C:\RESRAD\_Family\BUILD\Bldg 241.bld

Evaluation Time: 0.0000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
TH-232	1.25E+01	1.25E+01
RA-228		
TH-228	1.19E-02	1.19E-02
K-40	3.15E-01	3.15E-01

Title : Parcel C Building 241

Input File : C:\RESRAD\_Family\BUILD\Bldg 241.bld

Evaluation Time: 1.00000000 years

```
=====
=====
=====
Assessment for Time: 2
Time =1.00E+00 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00 [m]  
Geometry:: Type: Area Length[m]:1.00E+01 Width[m]:1.00E+01 Direction: z  
Pathway ::  
Direct Ingestion Rate: 0.000E+00 [1/hr]  
Fraction released to air: 1.000E-01  
Removable fraction: 0.000E+00  
Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	TH-232	9.150E+02
	TH-228	1.708E+01
	RA-228	1.039E+02
	K-40	1.250E+05

Title : Parcel C Building 241

Input File : C:\RESRAD\_Family\BUILD\Bldg 241.bld

Evaluation Time: 1.00000000 years

---

---

RESRAD-BUILD Dose Tables

---

---

Source Contributions to Receptor Doses

---

[mrem]

	Source	Total
	1	
Receptor 1	1.58E-01	1.58E-01
Total	1.58E-01	1.58E-01

Title : Parcel C Building 241

Input File : C:\RESRAD\_Family\BUILD\Bldg 241.bld

Evaluation Time: 1.00000000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.57E-01	0.00E+00	0.00E+00	0.00E+00	7.47E-04	0.00E+00
Total	1.57E-01	0.00E+00	0.00E+00	0.00E+00	7.47E-04	0.00E+00

Title : Parcel C Building 241

Input File : C:\RESRAD\_Family\BUILD\Bldg 241.bld

Evaluation Time: 1.00000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
TH-232	9.15E-06	9.15E-06
RA-228		
TH-228	1.18E-03	1.18E-03
K-40	1.55E-01	1.55E-01

Title : Parcel C Building 241

Input File : C:\RESRAD\_Family\BUILD\Bldg 241.bld

Full Summary

---

---

RESRAD-BUILD Dose (Time) Tables

---

---

Receptor Dose Received for the Exposure Duration

---

---

(mrem)

Evaluation Time [yr]

0.00E+00 1.00E+00

---

---

1 1.28E+01 1.58E-01

Receptor Dose/Yr Averaged Over Exposure Duration

---

---

(mrem/yr)

Evaluation Time [yr]

0.00E+00 1.00E+00

---

---

1 1.28E+01 1.58E-01

Title : Parcel C Building 241

Input File : C:\RESRAD\_Family\BUILD\Bldg 241.bld

---

---

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For time = 1.00E+00 yr	
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Risk by Pathway Detail.....	11
Risk by Nuclide Detail.....	12

Title : Parcel C Building 241

Input File : C:\RESRAD\_Family\BUILD\Bldg 241.bld

```

=====
=====
=====
RESRAD-BUILD Input Parameters
=====
=====
=====

```

```

Number of Sources : 1
Number of Receptors: 1
Total Time       : 3.650000E+02 days
Fraction Inside  : 5.000000E-01

```

```

===== Receptor Information =====

```

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.000	5.000	1.000	1.000	1.80E+01	1.00E-04

```

===== Receptor-Source Shielding Relationship =====

```

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

Title : Parcel C Building 241

Input File : C:\RESRAD\_Family\BUILD\Bldg 241.bld

==== Building Information ====

Building Air Exchange Rate: 8.00E-01 1/hr

Height [m]	Air Exchanges [m3/hr]
Area [m2]	*****
	* * *
	* * *
	* * * <=Q01: 2.00E+02
H1: 2.500	* Room 1 * Q10 : 2.00E+02
	* LAMBDA: 8.00E-01 * *
Area 100.000	* * *
	* * *
	*****

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

Title : Parcel C Building 241

Input File : C:\RESRAD\_Family\BUILD\Bldg 241.bld

==== Source Information ====

Source: 1

Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00[m]

Geometry:: Type: Area Length[m]:1.00E+01 Width[m]:1.00E+01 Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Radon Release Fraction: 1.000E-01

Contamination::

Nuclide	Concentration [dpm/m2]	Slope Factor	
		Ingestion [Risk/dpm]	Inhalation [Risk/dpm]
TH-232	1.830E+03	5.991E-11	1.950E-08
TH-228	0.000E+00	1.903E-10	6.488E-08
RA-228	0.000E+00	6.454E-10	1.971E-08
K-40	2.500E+05	1.545E-11	1.000E-10

Title : Parcel C Building 241

Input File : C:\RESRAD\_Family\BUILD\Bldg 241.bld

Evaluation Time: 0.0000000E+00 years

```
=====
=====
=====
Assessment for Time: 1
Time =0.00E+00 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00 [m]

Geometry:: Type: Area Length[m]:1.00E+01 Width[m]:1.00E+01 Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	TH-232	1.830E+03
	TH-228	0.000E+00
	RA-228	0.000E+00
	K-40	2.500E+05

Title : Parcel C Building 241

Input File : C:\RESRAD\_Family\BUILD\Bldg 241.bld

Evaluation Time: 0.0000000E+00 years

---

---

RESRAD-BUILD Risk Tables

---

---

Source Contributions to Receptor Risks

---

[Risk]

	Source	Total
	1	
Receptor 1	8.70E-07	8.70E-07
Total	8.70E-07	8.70E-07

Title : Parcel C Building 241

Input File : C:\RESRAD\_Family\BUILD\Bldg 241.bld

Evaluation Time: 0.0000000E+00 years

Pathway Detail of Risks

---

---

[Risk]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.79E-07	1.33E-08	1.14E-10	5.78E-07	1.27E-10	9.87E-08
Total	1.79E-07	1.33E-08	1.14E-10	5.78E-07	1.27E-10	9.87E-08

Title : Parcel C Building 241

Input File : C:\RESRAD\_Family\BUILD\Bldg 241.bld

Evaluation Time: 0.0000000E+00 years

Nuclide Detail of Risks

---

---

[Risk]

Source: 1

Nuclide	Receptor	Total
	1	
TH-232	3.30E-07	3.30E-07
RA-228		
TH-228	5.05E-09	5.05E-09
K-40	5.16E-07	5.16E-07

Title : Parcel C Building 241

Input File : C:\RESRAD\_Family\BUILD\Bldg 241.bld

Evaluation Time: 1.00000000 years

```
=====
=====
=====
Assessment for Time: 2
Time =1.00E+00 yr
=====
=====
```

==== Source Information =====

Source: 1

Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00 [m]  
Geometry:: Type: Area Length[m]:1.00E+01 Width[m]:1.00E+01 Direction: z  
Pathway ::  
Direct Ingestion Rate: 0.000E+00 [1/hr]  
Fraction released to air: 1.000E-01  
Removable fraction: 0.000E+00  
Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	TH-232	9.150E+02
	TH-228	1.708E+01
	RA-228	1.039E+02
	K-40	1.250E+05

Title : Parcel C Building 241

Input File : C:\RESRAD\_Family\BUILD\Bldg 241.bld

Evaluation Time: 1.00000000 years

---

---

RESRAD-BUILD Risk Tables

---

---

Source Contributions to Receptor Risks

---

[Risk]

	Source	Total
	1	
Receptor 1	1.21E-07	1.21E-07
Total	1.21E-07	1.21E-07

Title : Parcel C Building 241

Input File : C:\RESRAD\_Family\BUILD\Bldg 241.bld

Evaluation Time: 1.00000000 years

Pathway Detail of Risks

[Risk]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.20E-07	0.00E+00	0.00E+00	0.00E+00	6.20E-10	0.00E+00
Total	1.20E-07	0.00E+00	0.00E+00	0.00E+00	6.20E-10	0.00E+00

Title : Parcel C Building 241

Input File : C:\RESRAD\_Family\BUILD\Bldg 241.bld

Evaluation Time: 1.00000000 years

Nuclide Detail of Risks

---

---

[Risk]

Source: 1

Nuclide	Receptor	Total
	1	
TH-232	6.01E-12	6.01E-12
RA-228		
TH-228	9.49E-10	9.49E-10
K-40	1.19E-07	1.19E-07

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 235.bld

---

---

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Full Summary.....	13

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 235.bld

=====  
=====  
==  
== RESRAD-BUILD Input Parameters ==  
==  
=====  
=====

Number of Sources : 1  
Number of Receptors: 1  
Total Time : 3.650000E+02 days  
Fraction Inside : 5.000000E-01

=====  
===== Receptor Information =====

Receptor	Room	x	y	z	FracTime	Inhalation	Ingestion(Dust)
		[m]	[m]	[m]		[m3/day]	[m2/hr]
1	1	5.000	5.000	1.000	1.000	1.80E+01	1.00E-04

=====  
===== Receptor-Source Shielding Relationship =====

Receptor	Source	Density	Thickness	Material
		[g/cm3]	[cm]	
1	1	2.40E+00	0.00E+00	Concrete

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 235.bld

==== Building Information =====

Building Air Exchange Rate: 8.00E-01 1/hr

Height [m]	Air Exchanges [m3/hr]
Area [m2]	
	*****
	* * *
	* * *
	* * *
H1: 2.500	* Room 1 * Q10 : 2.00E+02
	* LAMBDA: 8.00E-01 * <=Q01: 2.00E+02
Area 100.000	* * *
	* * *
	*****

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 235.bld

==== Source Information =====

Source: 1

Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00[m]  
 Geometry:: Type: Area Area:1.00E+02 [m2] Direction: z  
 Pathway ::  
     Direct Ingestion Rate: 0.000E+00 [1/hr]  
     Fraction released to air: 1.000E-01  
     Removable fraction: 5.000E-01  
     Time to Remove: 3.650E+02 [day]  
  
     Radon Release Fraction: 1.000E-01

Contamination::

Nuclide Concentration Dose Conversion Factor (Library: FGR 13 Morbidity)

		Ingestion	Inhalation	Submersion
	[dpm/m2]	[mrem/dpm]	[mrem/dpm]	[mrem/yr/ (dpm/m3)]
PU-239	2.000E+03	1.595E-03	1.932E-01	2.231E-07
U-235	0.000E+00	1.204E-04	5.541E-02	4.063E-04
PA-231	0.000E+00	4.775E-03	5.766E-01	9.049E-05
TH-232	7.300E+02	1.230E-03	7.387E-01	4.588E-07
TH-228	0.000E+00	3.642E-04	1.556E-01	4.224E-03
AC-227	0.000E+00	6.665E-03	3.029E+00	9.734E-04
RA-228	0.000E+00	6.496E-04	2.287E-03	2.515E-03
RA-226	2.000E+03	5.950E-04	3.871E-03	4.663E-03
PB-210	0.000E+00	2.422E-03	6.214E-03	4.698E-06
CS-137	1.000E+05	2.252E-05	1.437E-05	1.434E-03
SR-90	2.000E+04	6.883E-05	5.894E-04	1.039E-05

Title : Default Case for RESRAD-BUILD  
Input File : C:\RESRAD\_Family\BUILD\Bldg 235.bld  
Evaluation Time: 0.0000000E+00 years

=====

=====

==== Assessment for Time: 1 =====

==== Time =0.00E+00 yr =====

=====

=====

===== Source Information =====

Source: 1

Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00 [m]  
Geometry:: Type: Area Area:1.00E+02 [m2] Direction: z  
Pathway ::  
Direct Ingestion Rate: 0.000E+00 [1/hr]  
Fraction released to air: 1.000E-01  
Removable fraction: 5.000E-01  
Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	PU-239	2.000E+03
	U-235	0.000E+00
	PA-231	0.000E+00
	TH-232	7.300E+02
	TH-228	0.000E+00
	AC-227	0.000E+00
	RA-228	0.000E+00
	RA-226	2.000E+03
	PB-210	0.000E+00
	CS-137	1.000E+05
	SR-90	2.000E+04

Title : Default Case for RESRAD-BUILD  
Input File : C:\RESRAD\_Family\BUILD\Bldg 235.bld  
Evaluation Time: 0.0000000E+00 years

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---

RESRAD-BUILD Dose Tables

---

---

Source Contributions to Receptor Doses

---

[mrem]

	Source	Total
	1	
Receptor 1	9.32E+00	9.32E+00
Total	9.32E+00	9.32E+00

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 235.bld

Evaluation Time: 0.0000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	3.82E-01	2.77E-02	2.07E-04	8.69E+00	2.19E-03	2.17E-01
Total	3.82E-01	2.77E-02	2.07E-04	8.69E+00	2.19E-03	2.17E-01

Title : Default Case for RESRAD-BUILD  
Input File : C:\RESRAD\_Family\BUILD\Bldg 235.bld  
Evaluation Time: 0.0000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
PU-239	3.63E+00	3.63E+00
U-235	4.94E-10	4.94E-10
PA-231	3.59E-14	3.59E-14
AC-227	1.38E-15	1.38E-15
TH-232	4.97E+00	4.97E+00
RA-228		
TH-228	4.74E-03	4.74E-03
RA-226	1.25E-01	1.25E-01
PB-210	3.38E-03	3.38E-03
CS-137	4.51E-01	4.51E-01
SR-90	1.37E-01	1.37E-01



Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 235.bld

Evaluation Time: 1.00000000 years

=====

=====

=====

=====

RESRAD-BUILD Dose Tables

=====

=====

=====

Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	2.51E-01	2.51E-01
Total	2.51E-01	2.51E-01

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 235.bld

Evaluation Time: 1.00000000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	2.49E-01	0.00E+00	0.00E+00	0.00E+00	1.72E-03	0.00E+00
Total	2.49E-01	0.00E+00	0.00E+00	0.00E+00	1.72E-03	0.00E+00

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 235.bld

Evaluation Time: 1.00000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
PU-239	9.10E-06	9.10E-06
U-235	2.25E-12	2.25E-12
PA-231	1.01E-17	1.01E-17
AC-227	1.39E-18	1.39E-18
TH-232	3.68E-06	3.68E-06
RA-228		
TH-228	4.72E-04	4.72E-04
RA-226	1.58E-02	1.58E-02
PB-210	2.39E-06	2.39E-06
CS-137	2.34E-01	2.34E-01
SR-90	4.73E-04	4.73E-04

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 235.bld

Full Summary

---

---

RESRAD-BUILD Dose (Time) Tables

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Receptor Dose Received for the Exposure Duration

---

---

(mrem)

Evaluation Time [yr]

0.00E+00 1.00E+00

---

---

1 9.32E+00 2.51E-01

Receptor Dose/Yr Averaged Over Exposure Duration

---

---

(mrem/yr)

Evaluation Time [yr]

0.00E+00 1.00E+00

---

---

1 9.33E+00 2.51E-01

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 235.bld

---

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Risk by Pathway Detail.....	11
Risk by Nuclide Detail.....	12

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 235.bld

=====

=====

=====

RESRAD-BUILD Input Parameters

=====

=====

Number of Sources : 1  
Number of Receptors: 1  
Total Time : 3.650000E+02 days  
Fraction Inside : 5.000000E-01

===== Receptor Information =====

Receptor	Room	x	y	z	FracTime	Inhalation	Ingestion(Dust)
		[m]	[m]	[m]		[m3/day]	[m2/hr]
1	1	5.000	5.000	1.000	1.000	1.80E+01	1.00E-04

===== Receptor-Source Shielding Relationship =====

Receptor	Source	Density	Thickness	Material
		[g/cm3]	[cm]	
1	1	2.40E+00	0.00E+00	Concrete

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 235.bld

==== Building Information ====

Building Air Exchange Rate: 8.00E-01 1/hr

Height [m]	Air Exchanges [m3/hr]
Area [m2]	
	*****
	* * *
	* * *
	* * * <=Q01: 2.00E+02
H1: 2.500	* Room 1 * Q10 : 2.00E+02
	* LAMBDA: 8.00E-01 *
Area 100.000	* * *
	* * *
	*****

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 235.bld

==== Source Information =====

Source: 1

Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00[m]

Geometry:: Type: Area Area:1.00E+02 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Radon Release Fraction: 1.000E-01

Contamination::

	Nuclide Concentration [dpm/m2]	Slope Factor	
		Ingestion [Risk/dpm]	Inhalation [Risk/dpm]
PU-239	2.000E+03	7.838E-11	2.482E-08
U-235	0.000E+00	4.398E-11	1.126E-08
PA-231	0.000E+00	1.018E-10	3.432E-08
TH-232	7.300E+02	5.991E-11	1.950E-08
TH-228	0.000E+00	1.903E-10	6.488E-08
AC-227	0.000E+00	2.941E-10	9.588E-08
RA-228	0.000E+00	6.454E-10	1.971E-08
RA-226	2.000E+03	2.319E-10	1.273E-08
PB-210	0.000E+00	5.374E-10	7.322E-09
CS-137	1.000E+05	1.685E-11	5.045E-11
SR-90	2.000E+04	4.293E-11	1.952E-10

Title : Default Case for RESRAD-BUILD  
Input File : C:\RESRAD\_Family\BUILD\Bldg 235.bld  
Evaluation Time: 0.0000000E+00 years

=====  
=====  
=====  
Assessment for Time: 1  
Time =0.00E+00 yr  
=====  
=====  
=====

=====  
Source Information  
=====

Source: 1  
Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00 [m]  
Geometry:: Type: Area Area:1.00E+02 [m2] Direction: z  
Pathway ::  
Direct Ingestion Rate: 0.000E+00 [1/hr]  
Fraction released to air: 1.000E-01  
Removable fraction: 5.000E-01  
Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	PU-239	2.000E+03
	U-235	0.000E+00
	PA-231	0.000E+00
	TH-232	7.300E+02
	TH-228	0.000E+00
	AC-227	0.000E+00
	RA-228	0.000E+00
	RA-226	2.000E+03
	PB-210	0.000E+00
	CS-137	1.000E+05
	SR-90	2.000E+04

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 235.bld

Evaluation Time: 0.0000000E+00 years

---

---

RESRAD-BUILD Risk Tables

---

---

Source Contributions to Receptor Risks

---

[Risk]

	Source	Total
	1	
Receptor 1	1.29E-06	1.29E-06
Total	1.29E-06	1.29E-06

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 235.bld

Evaluation Time: 0.0000000E+00 years

Pathway Detail of Risks

---

---

[Risk]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	2.85E-07	2.07E-08	1.54E-10	9.10E-07	2.58E-09	7.71E-08
Total	2.85E-07	2.07E-08	1.54E-10	9.10E-07	2.58E-09	7.71E-08

Title : Default Case for RESRAD-BUILD  
Input File : C:\RESRAD\_Family\BUILD\Bldg 235.bld  
Evaluation Time: 0.00000000E+00 years

Nuclide Detail of Risks

---

---

[Risk]

Source: 1

Nuclide	Receptor	Total
	1	
PU-239	4.60E-07	4.60E-07
U-235	1.01E-16	1.01E-16
PA-231	2.11E-21	2.11E-21
AC-227	4.39E-23	4.39E-23
TH-232	1.32E-07	1.32E-07
RA-228		
TH-228	2.02E-09	2.02E-09
RA-226	2.65E-07	2.65E-07
PB-210	2.34E-09	2.34E-09
CS-137	3.71E-07	3.71E-07
SR-90	5.53E-08	5.53E-08

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 235.bld

Evaluation Time: 1.00000000 years

```
=====
=====
=====
Assessment for Time: 2
Time =1.00E+00 yr
=====
=====
```

=====  
Source Information  
=====

Source: 1

Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00 [m]  
Geometry:: Type: Area Area:1.00E+02 [m2] Direction: z  
Pathway ::  
Direct Ingestion Rate: 0.000E+00 [1/hr]  
Fraction released to air: 1.000E-01  
Removable fraction: 0.000E+00  
Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	PU-239	1.000E+03
	U-235	9.846E-07
	PA-231	1.040E-11
	TH-232	3.650E+02
	TH-228	6.815E+00
	AC-227	1.094E-13
	RA-228	4.145E+01
	RA-226	9.996E+02
	PB-210	3.060E+01
	CS-137	4.886E+04
	SR-90	9.765E+03

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 235.bld

Evaluation Time: 1.00000000 years

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---

RESRAD-BUILD Risk Tables

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---

Source Contributions to Receptor Risks

---

[Risk]

	Source	Total
	1	
Receptor 1	1.88E-07	1.88E-07
Total	1.88E-07	1.88E-07

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 235.bld

Evaluation Time: 1.00000000 years

Pathway Detail of Risks

[Risk]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.86E-07	0.00E+00	0.00E+00	0.00E+00	1.93E-09	0.00E+00
Total	1.86E-07	0.00E+00	0.00E+00	0.00E+00	1.93E-09	0.00E+00

Title : Default Case for RESRAD-BUILD

Input File : C:\RESRAD\_Family\BUILD\Bldg 235.bld

Evaluation Time: 1.00000000 years

Nuclide Detail of Risks

---

---

[Risk]

Source: 1

Nuclide	Receptor	Total
	1	
PU-239	6.17E-12	6.17E-12
U-235	1.61E-18	1.61E-18
PA-231	7.33E-24	7.33E-24
AC-227	1.02E-24	1.02E-24
TH-232	2.42E-12	2.42E-12
RA-228		
TH-228	3.79E-10	3.79E-10
RA-226	1.26E-08	1.26E-08
PB-210	1.64E-12	1.64E-12
CS-137	1.74E-07	1.74E-07
SR-90	3.76E-10	3.76E-10

Title : Parcel C Building 271

Input File : C:\RESRAD\_Family\BUILD\Bldg 271.bld

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For time = 1.00E+00 yr	
Time Specific Parameters.....	9
Receptor-Source Dose Summary.....	10
Dose by Pathway Detail.....	11
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Full Summary.....	13

Title : Parcel C Building 271

Input File : C:\RESRAD\_Family\BUILD\Bldg 271.bld

=====

=====

=====

RESRAD-BUILD Input Parameters

=====

=====

Number of Sources : 1  
Number of Receptors: 1  
Total Time : 3.650000E+02 days  
Fraction Inside : 5.000000E-01

===== Receptor Information =====

Receptor	Room	x	y	z	FracTime	Inhalation	Ingestion(Dust)
		[m]	[m]	[m]		[m3/day]	[m2/hr]
1	1	5.000	5.000	1.000	1.000	1.80E+01	1.00E-04

===== Receptor-Source Shielding Relationship =====

Receptor	Source	Density	Thickness	Material
		[g/cm3]	[cm]	
1	1	2.40E+00	0.00E+00	Concrete

Title : Parcel C Building 271

Input File : C:\RESRAD\_Family\BUILD\Bldg 271.bld

==== Building Information =====

Building Air Exchange Rate: 8.00E-01 1/hr

Height [m]	Area [m2]	Air Exchanges [m3/hr]
		*****
		* * *
		* * *
		* * *
H1: 2.500		<=Q01: 2.00E+02
		* Room 1 * Q10 : 2.00E+02
		* LAMBDA: 8.00E-01 *
Area 100.000		* * *
		* * *
		*****

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

Title : Parcel C Building 271

Input File : C:\RESRAD\_Family\BUILD\Bldg 271.bld

==== Source Information =====

Source: 1

Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00[m]

Geometry:: Type: Area Length[m]:1.00E+01 Width[m]:1.00E+01 Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Radon Release Fraction: 1.000E-01

Contamination::

Nuclide Concentration Dose Conversion Factor (Library: FGR 11)

	[dpm/m2]	Dose Conversion Factor (Library: FGR 11)		
		Ingestion [mrem/dpm]	Inhalation [mrem/dpm]	Submersion [mrem/yr/ (dpm/m3)]
RA-226	1.000E+04	5.950E-04	3.871E-03	4.663E-03
PB-210	0.000E+00	2.422E-03	6.214E-03	4.698E-06

Title : Parcel C Building 271

Input File : C:\RESRAD\_Family\BUILD\Bldg 271.bld

Evaluation Time: 0.0000000E+00 years

```
=====
=====
=====
Assessment for Time: 1
Time =0.00E+00 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00 [m]

Geometry:: Type: Area Length[m]:1.00E+01 Width[m]:1.00E+01 Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	RA-226	1.000E+04
	PB-210	0.000E+00

Title : Parcel C Building 271

Input File : C:\RESRAD\_Family\BUILD\Bldg 271.bld

Evaluation Time: 0.0000000E+00 years

---

---

RESRAD-BUILD Dose Tables

---

---

Source Contributions to Receptor Doses

---

[mrem]

	Source	Total
	1	
Receptor 1	6.44E-01	6.44E-01
Total	6.44E-01	6.44E-01

Title : Parcel C Building 271

Input File : C:\RESRAD\_Family\BUILD\Bldg 271.bld

Evaluation Time: 0.0000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.07E-01	7.99E-03	6.52E-05	3.63E-01	1.06E-02	1.54E-01
Total	1.07E-01	7.99E-03	6.52E-05	3.63E-01	1.06E-02	1.54E-01

Title : Parcel C Building 271

Input File : C:\RESRAD\_Family\BUILD\Bldg 271.bld

Evaluation Time: 0.0000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
RA-226	6.27E-01	6.27E-01
PB-210	1.69E-02	1.69E-02

Title : Parcel C Building 271

Input File : C:\RESRAD\_Family\BUILD\Bldg 271.bld

Evaluation Time: 1.00000000 years

```
=====
=====
=====
Assessment for Time: 2
Time =1.00E+00 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00 [m]  
Geometry:: Type: Area Length[m]:1.00E+01 Width[m]:1.00E+01 Direction: z  
Pathway ::  
Direct Ingestion Rate: 0.000E+00 [1/hr]  
Fraction released to air: 1.000E-01  
Removable fraction: 0.000E+00  
Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	RA-226	4.998E+03
	PB-210	1.530E+02

Title : Parcel C Building 271

Input File : C:\RESRAD\_Family\BUILD\Bldg 271.bld

Evaluation Time: 1.00000000 years

---

---

RESRAD-BUILD Dose Tables

---

---

Source Contributions to Receptor Doses

---

[mrem]

	Source	Total
	1	
Receptor 1	7.86E-02	7.86E-02
Total	7.86E-02	7.86E-02

Title : Parcel C Building 271

Input File : C:\RESRAD\_Family\BUILD\Bldg 271.bld

Evaluation Time: 1.00000000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	7.15E-02	0.00E+00	0.00E+00	0.00E+00	7.09E-03	0.00E+00
Total	7.15E-02	0.00E+00	0.00E+00	0.00E+00	7.09E-03	0.00E+00

Title : Parcel C Building 271

Input File : C:\RESRAD\_Family\BUILD\Bldg 271.bld

Evaluation Time: 1.00000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
RA-226	7.86E-02	7.86E-02
PB-210	1.19E-05	1.19E-05

Title : Parcel C Building 271

Input File : C:\RESRAD\_Family\BUILD\Bldg 271.bld

Full Summary

---

---

RESRAD-BUILD Dose (Time) Tables

---

---

Receptor Dose Received for the Exposure Duration

---

---

(mrem)

Evaluation Time [yr]

0.00E+00 1.00E+00

---

---

1 6.44E-01 7.86E-02

Receptor Dose/Yr Averaged Over Exposure Duration

---

---

(mrem/yr)

Evaluation Time [yr]

0.00E+00 1.00E+00

---

---

1 6.44E-01 7.86E-02

Title : Parcel C Building 271

Input File : C:\RESRAD\_Family\BUILD\Bldg 271.bld

---

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For time = 1.00E+00 yr	
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Risk by Pathway Detail.....	11
Risk by Nuclide Detail.....	12

Title : Parcel C Building 271

Input File : C:\RESRAD\_Family\BUILD\Bldg 271.bld

=====  
=====  
== RESRAD-BUILD Input Parameters ==  
=====  
=====

Number of Sources : 1  
Number of Receptors: 1  
Total Time : 3.650000E+02 days  
Fraction Inside : 5.000000E-01

===== Receptor Information =====

Receptor	Room	x	y	z	FracTime	Inhalation	Ingestion(Dust)
		[m]	[m]	[m]		[m3/day]	[m2/hr]
1	1	5.000	5.000	1.000	1.000	1.80E+01	1.00E-04

===== Receptor-Source Shielding Relationship =====

Receptor	Source	Density	Thickness	Material
		[g/cm3]	[cm]	
1	1	2.40E+00	0.00E+00	Concrete

Title : Parcel C Building 271

Input File : C:\RESRAD\_Family\BUILD\Bldg 271.bld

==== Building Information ====

Building Air Exchange Rate: 8.00E-01 1/hr

Height [m]	Area [m2]	Air Exchanges [m3/hr]
		*****
		* * *
		* * *
		* * *
H1: 2.500		<=Q01: 2.00E+02
		* Room 1 * Q10 : 2.00E+02
		* LAMBDA: 8.00E-01 *
Area 100.000		* * *
		* * *
		*****

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

Title : Parcel C Building 271

Input File : C:\RESRAD\_Family\BUILD\Bldg 271.bld

==== Source Information =====

Source: 1

Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00[m]

Geometry:: Type: Area Length[m]:1.00E+01 Width[m]:1.00E+01 Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Radon Release Fraction: 1.000E-01

Contamination::

Nuclide	Concentration	Slope Factor	
		Ingestion	Inhalation
	[dpm/m2]	[Risk/dpm]	[Risk/dpm]
RA-226	1.000E+04	2.319E-10	1.273E-08
PB-210	0.000E+00	5.374E-10	7.322E-09

Title : Parcel C Building 271

Input File : C:\RESRAD\_Family\BUILD\Bldg 271.bld

Evaluation Time: 0.0000000E+00 years

```
=====
=====
=====
Assessment for Time: 1
Time =0.00E+00 yr
=====
=====
```

==== Source Information =====

Source: 1

Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00 [m]

Geometry:: Type: Area Length[m]:1.00E+01 Width[m]:1.00E+01 Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	RA-226	1.000E+04
	PB-210	0.000E+00

Title : Parcel C Building 271

Input File : C:\RESRAD\_Family\BUILD\Bldg 271.bld

Evaluation Time: 0.0000000E+00 years

=====

=====

=====

===== RESRAD-BUILD Risk Tables =====

=====

=====

Source Contributions to Receptor Risks

[Risk]

	Source	Total
	1	
Receptor 1	1.34E-06	1.34E-06
Total	1.34E-06	1.34E-06

Title : Parcel C Building 271

Input File : C:\RESRAD\_Family\BUILD\Bldg 271.bld

Evaluation Time: 0.0000000E+00 years

Pathway Detail of Risks

[Risk]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	8.14E-08	6.06E-09	4.95E-11	1.18E-06	1.26E-08	5.86E-08
Total	8.14E-08	6.06E-09	4.95E-11	1.18E-06	1.26E-08	5.86E-08

Title : Parcel C Building 271

Input File : C:\RESRAD\_Family\BUILD\Bldg 271.bld

Evaluation Time: 0.0000000E+00 years

Nuclide Detail of Risks

[Risk]

Source: 1

Nuclide	Receptor	Total
	1	
RA-226	1.33E-06	1.33E-06
PB-210	1.17E-08	1.17E-08

Title : Parcel C Building 271

Input File : C:\RESRAD\_Family\BUILD\Bldg 271.bld

Evaluation Time: 1.00000000 years

```
=====
=====
=====
Assessment for Time: 2
Time =1.00E+00 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00 [m]

Geometry:: Type: Area Length[m]:1.00E+01 Width[m]:1.00E+01 Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	RA-226	4.998E+03
	PB-210	1.530E+02

Title : Parcel C Building 271

Input File : C:\RESRAD\_Family\BUILD\Bldg 271.bld

Evaluation Time: 1.00000000 years

---

---

RESRAD-BUILD Risk Tables

---

---

Source Contributions to Receptor Risks

---

[Risk]

	Source	Total
	1	
Receptor 1	6.27E-08	6.27E-08
Total	6.27E-08	6.27E-08

Title : Parcel C Building 271

Input File : C:\RESRAD\_Family\BUILD\Bldg 271.bld

Evaluation Time: 1.00000000 years

Pathway Detail of Risks

---

---

[Risk]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	5.43E-08	0.00E+00	0.00E+00	0.00E+00	8.42E-09	0.00E+00
Total	5.43E-08	0.00E+00	0.00E+00	0.00E+00	8.42E-09	0.00E+00

Title : Parcel C Building 271

Input File : C:\RESRAD\_Family\BUILD\Bldg 271.bld

Evaluation Time: 1.00000000 years

Nuclide Detail of Risks

---

---

[Risk]

Source: 1

Nuclide	Receptor	Total
	1	
RA-226	6.27E-08	6.27E-08
PB-210	8.17E-12	8.17E-12

Title : Parcel C Building 272

Input File : C:\RESRAD\_Family\BUILD\Bldg 272.bld

---

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For time = 1.00E+00 yr	
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Dose by Pathway Detail.....	11
Dose by Nuclide Detail.....	12
Full Summary.....	13

Title : Parcel C Building 272

Input File : C:\RESRAD\_Family\BUILD\Bldg 272.bld

=====

=====

=====

RESRAD-BUILD Input Parameters

=====

=====

Number of Sources : 1  
Number of Receptors: 1  
Total Time : 3.650000E+02 days  
Fraction Inside : 5.000000E-01

===== Receptor Information =====

Receptor	Room	x	y	z	FracTime	Inhalation	Ingestion(Dust)
		[m]	[m]	[m]		[m3/day]	[m2/hr]
1	1	5.000	5.000	1.000	1.000	1.80E+01	1.00E-04

===== Receptor-Source Shielding Relationship =====

Receptor	Source	Density	Thickness	Material
		[g/cm3]	[cm]	
1	1	2.40E+00	0.00E+00	Concrete

Title : Parcel C Building 272

Input File : C:\RESRAD\_Family\BUILD\Bldg 272.bld

==== Building Information =====

Building Air Exchange Rate: 8.00E-01 1/hr

Height [m]	Area [m2]	Air Exchanges [m3/hr]
		*****
		* * *
		* * *
		* * *
		<=Q01: 2.00E+02
H1: 2.500		* Room 1 * Q10 : 2.00E+02
		* LAMBDA: 8.00E-01 *
Area 100.000		* * *
		* * *
		*****

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

Title : Parcel C Building 272

Input File : C:\RESRAD\_Family\BUILD\Bldg 272.bld

==== Source Information =====

Source: 1

Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00[m]

Geometry:: Type: Area Length[m]:1.00E+01 Width[m]:1.00E+01 Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Radon Release Fraction: 1.000E-01

Contamination::

Nuclide Concentration Dose Conversion Factor (Library: FGR 11)

	[dpm/m2]	Dose Conversion Factor		
		Ingestion [mrem/dpm]	Inhalation [mrem/dpm]	Submersion [mrem/yr/(dpm/m3)]
RA-226	3.330E+03	5.950E-04	3.871E-03	4.663E-03
PB-210	0.000E+00	2.422E-03	6.214E-03	4.698E-06
CS-137	1.670E+05	2.252E-05	1.437E-05	1.434E-03
CO-60	1.670E+05	1.212E-05	9.865E-05	6.629E-03

Title : Parcel C Building 272

Input File : C:\RESRAD\_Family\BUILD\Bldg 272.bld

Evaluation Time: 0.0000000E+00 years

```
=====
=====
=====
Assessment for Time: 1
Time =0.00E+00 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00 [m]

Geometry:: Type: Area Length[m]:1.00E+01 Width[m]:1.00E+01 Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	RA-226	3.330E+03
	PB-210	0.000E+00
	CS-137	1.670E+05
	CO-60	1.670E+05

Title : Parcel C Building 272

Input File : C:\RESRAD\_Family\BUILD\Bldg 272.bld

Evaluation Time: 0.0000000E+00 years

---

---

RESRAD-BUILD Dose Tables

---

---

Source Contributions to Receptor Doses

---

[mrem]

	Source	Total
	1	
Receptor 1	3.66E+00	3.66E+00
Total	3.66E+00	3.66E+00

Title : Parcel C Building 272

Input File : C:\RESRAD\_Family\BUILD\Bldg 272.bld

Evaluation Time: 0.0000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	3.01E+00	1.98E-01	1.61E-03	2.66E-01	3.54E-03	1.80E-01
Total	3.01E+00	1.98E-01	1.61E-03	2.66E-01	3.54E-03	1.80E-01

Title : Parcel C Building 272

Input File : C:\RESRAD\_Family\BUILD\Bldg 272.bld

Evaluation Time: 0.0000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
RA-226	2.09E-01	2.09E-01
PB-210	5.63E-03	5.63E-03
CS-137	7.49E-01	7.49E-01
CO-60	2.70E+00	2.70E+00

Title : Parcel C Building 272

Input File : C:\RESRAD\_Family\BUILD\Bldg 272.bld

Evaluation Time: 1.00000000 years

```
=====
=====
=====
Assessment for Time: 2
Time =1.00E+00 yr
=====
=====
```

=====  
Source Information  
=====

Source: 1

Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00 [m]

Geometry:: Type: Area Length[m]:1.00E+01 Width[m]:1.00E+01 Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]  
Fraction released to air: 1.000E-01  
Removable fraction: 0.000E+00  
Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	RA-226	1.664E+03
	PB-210	5.095E+01
	CS-137	8.159E+04
	CO-60	7.321E+04

Title : Parcel C Building 272

Input File : C:\RESRAD\_Family\BUILD\Bldg 272.bld

Evaluation Time: 1.00000000 years

---

---

RESRAD-BUILD Dose Tables

---

---

Source Contributions to Receptor Doses

---

[mrem]

	Source	Total
	1	
Receptor 1	1.79E+00	1.79E+00
Total	1.79E+00	1.79E+00

Title : Parcel C Building 272

Input File : C:\RESRAD\_Family\BUILD\Bldg 272.bld

Evaluation Time: 1.00000000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.79E+00	0.00E+00	0.00E+00	0.00E+00	2.36E-03	0.00E+00
Total	1.79E+00	0.00E+00	0.00E+00	0.00E+00	2.36E-03	0.00E+00

Title : Parcel C Building 272

Input File : C:\RESRAD\_Family\BUILD\Bldg 272.bld

Evaluation Time: 1.0000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
RA-226	2.62E-02	2.62E-02
PB-210	3.96E-06	3.96E-06
CS-137	3.88E-01	3.88E-01
CO-60	1.38E+00	1.38E+00

Title : Parcel C Building 272

Input File : C:\RESRAD\_Family\BUILD\Bldg 272.bld

Full Summary

=====

=====

=====

RESRAD-BUILD Dose (Time) Tables

=====

=====

=====

Receptor Dose Received for the Exposure Duration

(mrem)

Evaluation Time [yr]

0.00E+00 1.00E+00

1 3.66E+00 1.79E+00

Receptor Dose/Yr Averaged Over Exposure Duration

(mrem/yr)

Evaluation Time [yr]

0.00E+00 1.00E+00

1 3.66E+00 1.80E+00

Title : Parcel C Building 272

Input File : C:\RESRAD\_Family\BUILD\Bldg 272.bld

---

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Risk by Nuclide Detail.....	8
For time = 1.00E+00 yr	
Time Specific Parameters.....	9
Receptor-Source Risk Summary.....	10
Risk by Pathway Detail.....	11
Risk by Nuclide Detail.....	12

Title : Parcel C Building 272

Input File : C:\RESRAD\_Family\BUILD\Bldg 272.bld

=====

=====

=====

RESRAD-BUILD Input Parameters

=====

=====

Number of Sources : 1  
Number of Receptors: 1  
Total Time : 3.650000E+02 days  
Fraction Inside : 5.000000E-01

===== Receptor Information =====

Receptor	Room	x	y	z	FracTime	Inhalation	Ingestion(Dust)
		[m]	[m]	[m]		[m3/day]	[m2/hr]
1	1	5.000	5.000	1.000	1.000	1.80E+01	1.00E-04

===== Receptor-Source Shielding Relationship =====

Receptor	Source	Density	Thickness	Material
		[g/cm3]	[cm]	
1	1	2.40E+00	0.00E+00	Concrete

Title : Parcel C Building 272

Input File : C:\RESRAD\_Family\BUILD\Bldg 272.bld

==== Building Information =====

Building Air Exchange Rate: 8.00E-01 1/hr

Height [m]	Air Exchanges [m3/hr]
Area [m2]	*****
	* * *
	* * *
	* * * <=Q01: 2.00E+02
H1: 2.500	* Room 1 * Q10 : 2.00E+02
	* LAMBDA: 8.00E-01 * *
Area 100.000	* * *
	* * *
	*****

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

Title : Parcel C Building 272

Input File : C:\RESRAD\_Family\BUILD\Bldg 272.bld

==== Source Information =====

Source: 1

Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00[m]

Geometry:: Type: Area Length[m]:1.00E+01 Width[m]:1.00E+01 Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Radon Release Fraction: 1.000E-01

Contamination::

	Nuclide Concentration	Slope Factor	
		Ingestion	Inhalation
	[dpm/m2]	[Risk/dpm]	[Risk/dpm]
RA-226	3.330E+03	2.319E-10	1.273E-08
PB-210	0.000E+00	5.374E-10	7.322E-09
CS-137	1.670E+05	1.685E-11	5.045E-11
CO-60	1.670E+05	1.005E-11	4.550E-11

Title : Parcel C Building 272

Input File : C:\RESRAD\_Family\BUILD\Bldg 272.bld

Evaluation Time: 0.0000000E+00 years

```
=====
=====
=====
Assessment for Time: 1
Time =0.00E+00 yr
=====
=====
```

==== Source Information =====

Source: 1

Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00 [m]

Geometry:: Type: Area Length[m]:1.00E+01 Width[m]:1.00E+01 Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	RA-226	3.330E+03
	PB-210	0.000E+00
	CS-137	1.670E+05
	CO-60	1.670E+05

Title : Parcel C Building 272

Input File : C:\RESRAD\_Family\BUILD\Bldg 272.bld

Evaluation Time: 0.0000000E+00 years

---

---

RESRAD-BUILD Risk Tables

---

---

Source Contributions to Receptor Risks

---

[Risk]

	Source	Total
	1	
Receptor 1	3.09E-06	3.09E-06
Total	3.09E-06	3.09E-06

Title : Parcel C Building 272

Input File : C:\RESRAD\_Family\BUILD\Bldg 272.bld

Evaluation Time: 0.0000000E+00 years

Pathway Detail of Risks

---

---

[Risk]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	2.29E-06	1.51E-07	1.23E-09	5.24E-07	4.21E-09	1.19E-07
Total	2.29E-06	1.51E-07	1.23E-09	5.24E-07	4.21E-09	1.19E-07

Title : Parcel C Building 272

Input File : C:\RESRAD\_Family\BUILD\Bldg 272.bld

Evaluation Time: 0.0000000E+00 years

Nuclide Detail of Risks

[Risk]

Source: 1

Nuclide	Receptor	Total
	1	
RA-226	4.41E-07	4.41E-07
PB-210	3.89E-09	3.89E-09
CS-137	6.17E-07	6.17E-07
CO-60	2.03E-06	2.03E-06

Title : Parcel C Building 272

Input File : C:\RESRAD\_Family\BUILD\Bldg 272.bld

Evaluation Time: 1.00000000 years

```
=====
=====
=====
Assessment for Time: 2
Time =1.00E+00 yr
=====
=====
```

==== Source Information =====

Source: 1

Location:: Room : 1 x: 5.00 y: 5.00 z: 0.00 [m]

Geometry:: Type: Area Length[m]:1.00E+01 Width[m]:1.00E+01 Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]  
Fraction released to air: 1.000E-01  
Removable fraction: 0.000E+00  
Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	RA-226	1.664E+03
	PB-210	5.095E+01
	CS-137	8.159E+04
	CO-60	7.321E+04

Title : Parcel C Building 272

Input File : C:\RESRAD\_Family\BUILD\Bldg 272.bld

Evaluation Time: 1.00000000 years

---

---

RESRAD-BUILD Risk Tables

---

---

Source Contributions to Receptor Risks

---

[Risk]

	Source	Total
	1	
Receptor 1	1.37E-06	1.37E-06
Total	1.37E-06	1.37E-06

Title : Parcel C Building 272

Input File : C:\RESRAD\_Family\BUILD\Bldg 272.bld

Evaluation Time: 1.00000000 years

Pathway Detail of Risks

---

---

[Risk]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.36E-06	0.00E+00	0.00E+00	0.00E+00	2.80E-09	0.00E+00
Total	1.36E-06	0.00E+00	0.00E+00	0.00E+00	2.80E-09	0.00E+00

Title : Parcel C Building 272

Input File : C:\RESRAD\_Family\BUILD\Bldg 272.bld

Evaluation Time: 1.00000000 years

Nuclide Detail of Risks

---

---

[Risk]

Source: 1

Nuclide	Receptor	Total
	1	
RA-226	2.09E-08	2.09E-08
PB-210	2.72E-12	2.72E-12
CS-137	2.89E-07	2.89E-07
CO-60	1.06E-06	1.06E-06

**APPENDIX B**

**REMEDIAL ACTION ALTERNATIVE  
COST SUMMARY SHEETS**

**Base Realignment and Closure  
Program Management Office West  
1455 Frazee Road, Suite 900  
San Diego, California 92108-4310  
CONTRACT No. N62473-06-D-2201  
CTO No. 0006**

## **APPENDIX B**

**FINAL**

# **REMEDIAL ACTION ALTERNATIVE COST SUMMARY SHEETS**

**June 20, 2008**

**PARCEL C, HUNTERS POINT SHIPYARD  
SAN FRANCISCO, CALIFORNIA**

**DCN: ECSD-2201-0006-0077**



**TETRA TECH EC, INC.**

**1230 Columbia Street, Suite 750  
San Diego, CA 92101-8536**

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## ABBREVIATIONS AND ACRONYMS

CERCLA	Comprehensive Environmental Restoration and Compensation Liability Act
cy	cubic yard
EPA	U.S. Environmental Protection Agency
FS	Feasibility Study
ft <sup>3</sup>	cubic feet
IC	institutional controls
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
O&M	operation and maintenance
ROC	radionuclide of concern
RU	Remediation Unit

## 1.0 INTRODUCTION

This appendix describes each alternative and the associated components and assumptions used to develop the cost estimate used in the Addendum to the Revised Feasibility Study (FS) Report for Parcel C for Hunters Point Shipyard in San Francisco, California (SulTech, 2007). This appendix is organized as follows:

- Section 2.0 describes the purpose of the estimate.
- Section 3.0 presents the types of cost-estimating methods used.
- Section 4.0 summarizes the cost estimating methodology.
- Section 5.0 describes the components considered in each cost estimate.
- Section 6.0 provides assumptions used for each cost estimate.
- Section 7.0 summarizes the total costs for each alternative.
- Section 8.0 lists references used in preparing the cost estimate.

## 2.0 PURPOSE OF ESTIMATES

The cost estimates developed for this Radiological Addendum to the Revised FS Report for Parcel C (SulTech, 2007) follow the general guidelines as for FSs. Cost estimates are developed for FSs primarily to compare remedial alternatives during the remedy selection process, and not to establish project budgets or to negotiate Superfund enforcement settlements. The cost estimate in the record of decision reflects any changes to the remedial alternatives that occur during the remedy selection process as a result of new information or public comments (U.S. Environmental Protection Agency [EPA], 2000).

Cost estimates developed during the detailed analysis phase of a FS are used to compare alternatives and to support remedy selection. The National Oil and Hazardous Substances Pollution Contingency Plan includes the following language in its description of the cost criterion for the detailed analysis and remedy selection:

“The types of costs that shall be assessed include the following: (1) capital costs, including both direct and indirect costs; (2) Annual operations and maintenance costs; and (3) Net present values of capital and O&M [operation and maintenance] costs” Title 40 Code of Federal Regulations [CFR] Section 300.430 (e)(9)(iii)(G) (EPA, 2000).

The costs presented in this appendix are for comparison only; the estimated accuracy is within the expected accuracy range of cost estimates (e.g. -30 to +50 percent), in accordance with the guidelines for developing and documenting cost estimates for FSs under the Comprehensive Environmental Response, Compensation, and Liability Act (EPA, 2000).

### **3.0 TYPES OF COST ESTIMATING METHODS**

The cost estimates in this appendix are derived from the cost estimates presented in Appendix F of the Revised FS Report for Parcel C (SulTech, 2007). The Revised FS Report for Parcel C costs were developed using both detailed and parametric approaches, both accepted by EPA. These approaches are described below.

The detailed approach estimates cost on an item-by-item basis. Detailed methods typically rely on compiled sources of unit cost data for each item, taken from either a built-in database or from other sources. This method, also known as “bottom up” estimating, is used when design information is available (EPA, 2000).

The parametric approach relies on relationships between cost and design parameters. These relationships are usually either statistical or model-based. Statistically based approaches rely on scaled-up or scaled-down versions of projects where historical data on costs are available. Model-based approaches use a generic design linked to a cost database and are adjusted for site-specific information. This method, also known as “top down” estimating, is used when design information is not available (EPA, 2000).

## 4.0 METHODOLOGY

Cost estimates for this Radiological Addendum to the Revised FS Report for Parcel C were prepared in accordance with *A Guide to Developing and Documenting Cost Estimates during the Feasibility Study* (EPA, 2000). For the most part the costs were derived directly from Appendix F of the Revised FS Report for Parcel C (SulTech, 2007). Costs associated with activities not addressed by the Revised FS Report for Parcel C were estimated based on past experience with similar activities.

## 5.0 COMPONENTS OF THE COST ESTIMATE

The cost estimates for the remediation alternatives presented in the Revised FS Report for Parcel C included six components: grand total, total capital costs, total direct costs, annual operation and maintenance (O&M) costs, net present value of O&M costs, and contingency costs.

The cost estimates provided in this Radiological Addendum to the Revised FS Report for Parcel C are based on the total cost including overhead and profit presented in Appendix F of the Revised FS Report for Parcel C (SulTech, 2007). The main assumption is that activities common to both the Revised FS Report for Parcel C and this addendum will be addressed by the cost estimate provided in Appendix F of the Revised FS Report for Parcel C. For example, the cost associated with the Legal Controls (e.g., institutional controls [ICs], land transfer restrictions, and covenant to restrict use) are applicable to both chemical and radiological alternatives. The expectation is that one set of legal controls will address both chemical and radiological concerns. The cost estimates for these types of activities will not be added to the radiological addendum's cost estimate.

## 6.0 INDIVIDUAL COST ESTIMATE ASSUMPTIONS

General assumptions taken from Appendix F of the Revised FS Report for Parcel C (SulTech, 2007) for each cost estimate are summarized below:

1. There are general project management costs associated with each alternative. These costs are presented as Site-Wide Distributive Costs.
2. There are legal actions taken for each alternative (i.e., ICs, land transfer restrictions, covenant to restrict use). These costs are presented as Legal Controls.

The cost estimate components and specific assumption are presented for each alternative below.

### 6.1 COST ASSUMPTION ASSOCIATED WITH ALTERNATIVES S-1, GW-1, AND R-1: NO ACTION

Since no action means no remedial activities will take place, there are no costs associated with this alternative.

### 6.2 COST ASSUMPTION ASSOCIATED WITH ALTERNATIVE S-2: INSTITUTIONAL CONTROLS AND MAINTAINED LANDSCAPING

Alternative S-2 proposes to apply ICs to all redevelopment blocks. The costs associated with developing and issuing ICs for radionuclides are not in addition to chemical ICs and maintained landscaping.

The following assumptions apply to Alternative S-2.

1. The entire Parcel C would have ICs established as well as maintained landscaping and those costs are already shown in the Revised FS Report for Parcel C (SulTech, 2007).

The table below provides a breakdown of the estimated additional cost for Alternative S-2.

<b>Total Estimated Additional Cost for Alternative S-2</b>	<b>\$ 0</b>
--	-------------

### 6.3 COST ASSUMPTION ASSOCIATED WITH ALTERNATIVE S-3: EXCAVATION, DISPOSAL, MAINTAINED LANDSCAPING, AND INSTITUTIONAL CONTROLS

Alternative S-3 proposes to excavate and dispose of the soils associated with the Revised FS Report for Parcel C excavation of chemicals of concern, install ICs, and maintain landscaping on Parcel C.

The following assumptions apply to Alternative S-3:

1. It is assumed that none of the soil excavated for chemicals of concern will require a radiological survey since they are not in radiologically-impacted areas.
2. The costs for soil-maintained landscaping and ICs are already included in the Revised FS Report for Parcel C and are not duplicated here.

The table below provides a breakdown of the estimated additional cost for Alternative S-3.

<b>Total Estimated Additional Cost for Alternative S-3</b>	<b>\$</b>	<b>0</b>
--	-----------	----------

#### **6.4 COST ASSUMPTION ASSOCIATED WITH ALTERNATIVE S-4: COVERS AND INSTITUTIONAL CONTROLS**

Alternative S-4 proposes to install covers over the soils that are not already covered and to install ICs over the entire parcel. All these costs are included in the Revised FS Report for Parcel C and are not duplicated here.

The table below provides a breakdown of the estimated additional cost for Alternative S-4.

<b>Total Estimated Additional Cost for Alternative S-4</b>	<b>\$</b>	<b>0</b>
--	-----------	----------

#### **6.5 COST ASSUMPTION ASSOCIATED WITH ALTERNATIVE S-5: EXCAVATION, DISPOSAL, COVERS, VAPOR EXTRACTION, AND INSTITUTIONAL CONTROLS**

In addition to the Revised FS Report for Parcel C (SulTech, 2007) Alternative S-5 remedial actions, this radiological remedy does nothing for excavated soils for chemicals of concern.

The following assumptions apply to Alternative S-5:

1. It is assumed that none of the soil excavated for chemicals of concern will require a radiological survey.
2. The costs for soil-maintained landscaping and ICs are already included in the Revised FS Report for Parcel C and are not duplicated here.

The table below provides a breakdown of the estimated additional cost for Alternative S-5.

<b>Total Estimated Additional Cost for Alternative S-5</b>	<b>\$</b>	<b>0</b>
--	-----------	----------

#### **6.6 COST ASSUMPTIONS ASSOCIATED WITH ALTERNATIVE GW-2: LONG-TERM GROUNDWATER MONITORING AND INSTITUTIONAL CONTROLS**

In addition to the Revised FS Report for Parcel C (SulTech, 2007) Alternative GW-2 remedial actions, this radiological remedy proposes to sample the groundwater for radionuclides of concern (ROCs).

The following assumptions apply to Alternative GW-2:

1. Groundwater monitoring includes the sampling process. Radiological samples will be collected at the same time by the same personnel.
2. Radiological analysis of groundwater is assumed to be \$200 per sample.
3. Groundwater Remediation Units (RU) RU-C1, RU-C2, RU-C4, and non-plume are the units with radiologically-impacted buildings. There are 132 groundwater wells in those RUs (SulTech, 2007).

The table below provides a breakdown of the derivation of the estimated additional cost for Alternative GW-2.

<b>Legal Controls</b>	<b>Cost</b>
Institutional Control Remedial Design provided in SulTech, 2007	\$ 0
Finding of Suitability to Transfer provided in SulTech, 2007	\$ 0
Covenant to Restrict Use of Property provided in SulTech, 2007	\$ 0
132 wells sampled quarterly for first 2 years, semiannually for years 3 and 4, and annually for years 5 through 30 or 4,884 samples	\$ 976,800
20% Contingency	\$ 195,360
<b>Total Estimated Additional Cost for Alternative GW-2</b>	<b>\$ 1,172,000*</b>

*Notes:*

- \* Total estimated additional cost has been rounded to the nearest thousand.

**6.7 COST ASSUMPTIONS ASSOCIATED WITH ALTERNATIVES GW-3A: IN-SITU BIOREMEDIATION, LONG-TERM GROUNDWATER MONITORING, AND INSTITUTIONAL CONTROLS**

In addition to the Revised FS Report for Parcel C (SulTech, 2007) Alternative GW-3A remedial actions, this radiological remedy proposes to sample the groundwater for ROCs. Alternative GW-3A has no additional remedies for ROCs.

The following assumptions apply to Alternatives GW-3A:

1. Groundwater monitoring includes the sampling process. Radiological samples will be collected at the same time by the same personnel.
2. Radiological analysis of groundwater is assumed to be \$200 per sample.
3. Groundwater Remediation Units (RU) RU-C1, RU-C2, RU-C4, and non-plume are the units with radiologically-impacted buildings. There are a total of 132 groundwater wells in those RUs (SulTech, 2007).
4. Each of the wells is sampled 72 times, over the 30-year period of chemical treatment and monitoring, for radiological analysis.

The table below provides a breakdown of the derivation of the estimated additional cost for Alternatives GW-3A.

<b>Legal Controls</b>	<b>Cost</b>
Institutional Control Remedial Design provided in SulTech, 2007	\$ 0
Fining of Suitability to Transfer provided in SulTech, 2007	\$ 0
Covenant to Restrict Use of Property provided in SulTech, 2007	\$ 0
132 wells, each sampled 72 times over a 30-year period for a total of 9,504 samples	\$ 1,900,800
20% Contingency	\$ 300,160
<b>Total Estimated Additional Cost for Alternative GW-3A</b>	<b>\$ 2,281,000*</b>

**Notes:**

- \* Total estimated additional cost has been rounded to the nearest thousand.

**6.8 COST ASSUMPTIONS ASSOCIATED WITH ALTERNATIVES GW-3B: IN-SITU ZERO-VALENT IRON REDUCTION, BIOREMEDIATION, LONG-TERM GROUNDWATER MONITORING, AND INSTITUTIONAL CONTROLS**

In addition to the Revised FS Report for Parcel C (SulTech, 2007) Alternative GW-3B remedial actions, this radiological remedy proposes to sample the groundwater for ROCs. Alternative GW-3B has no additional remedies for ROCs.

The following assumptions apply to Alternative GW-3B:

1. Groundwater monitoring includes the sampling process. Radiological samples will be collected at the same time by the same personnel.
2. Radiological analysis of groundwater is assumed to be \$200 per sample.
3. Each of the wells is sampled 74 times, over the 30-year period of chemical treatment and monitoring, for radiological analysis.

The table below provides a breakdown of the derivation of the estimated additional cost for Alternative GW-3B.

<b>Legal Controls</b>	<b>Cost</b>
Institutional Control Remedial Design provided in SulTech, 2007	\$ 0
Fining of Suitability to Transfer provided in SulTech, 2007	\$ 0
Covenant to Restrict Use of Property provided in SulTech, 2007	\$ 0
132 wells each sampled 74 times over a 30-year period for a total of 9,768 samples	\$ 1,953,600
20% Contingency	\$ 390,720
<b>Total Estimated Additional Cost for Alternative GW-3B</b>	<b>\$ 2,344,000*</b>

**Notes:**

- \* Total estimated additional cost has been rounded to the nearest thousand.

## **6.9 COST ASSUMPTION ASSOCIATED WITH ALTERNATIVE R-2: SURVEY, DECONTAMINATION, DISPOSAL, RELEASE, AND INSTITUTIONAL CONTROLS**

Alternative R-2 consists of decontamination of radiologically-impacted buildings and dismantlement if necessary. Surveys would be performed on buildings except Building 205, trenches resulting from sewer and storm line removal, and remediated storm drain and sanitary sewer piping to meet the remedial action objectives and use of ICs.

The above-grade portions of Building 205, the discharge tunnel, and the first 10 feet of the Building 205 shaft would be surveyed to verify that no residual radioactivity is present above the remediation goals. The Building 205 Shaft below 10 feet would be abandoned as is due to the unsound condition of the building, health and safety hazards associated with field conditions, as well as many other unknowns. Institutional controls would be implemented to minimize inadvertent contact with radiologically-impacted media.

The following assumptions apply to Alternative R-2:

1. Each building (203, 211, 214, 224, 241, 253, 271, and 272) will be divided into 31 Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) (Department of Defense et al., 2000) survey units. The cost for developing the survey plans, performing the survey, and drafting the report is \$6,500 per survey unit. This cost is based on the San Francisco 49ers Parcel D proposal summary.
2. Each building (203, 211, 214, 224, 241, 253, 271, and 272) is assumed to generate one waste disposal bin of material (e.g., flooring, ventilation piping, etc.). The assumed disposal cost of \$11,880 per bin results in a total cost of \$95,040. It is assumed that one-half of a disposal bin is filled when surveying Building 205 for a total of \$5,940 plus \$95,040 or \$100,980.
3. Building 205 will be divided into 15 MARSSIM survey units, except for the shaft below 10 feet. The Building 205 shaft below 10 feet will not be surveyed due to the unsound condition of the building, health and safety hazards, as well as many other unknowns. This portion of the building will be abandoned in-place and ICs will be implemented to minimize inadvertent contact with radiologically-impacted media. The ICs for Building 205 are assumed to add no additional cost to the ICs already proposed for Parcel C. The cost for developing the survey plans, performing the survey, and drafting the report is \$6,500 per survey unit for a total of \$97,500.
4. Removal of the Parcel C sewer and storm drain system piping is estimated to result in 60,000 cy of material to be excavated at an estimated cost of \$330 per cy. This results in a total excavation cost of \$19,800,000.
5. It is assumed that 5 percent of the material excavated during the Parcel C sewer and storm drain system removal will be radiologically-impacted resulting in approximately 3,000 cy of impacted material. The cost of disposal is assumed to be \$11,880 per bin, and based on 14 cy of soil per bin; the total disposal cost is estimated to be \$2,542,714. Note this does not include cost associated with disposal of

Comprehensive Environmental Restoration and Compensation Liability Act  
(CERCLA)-impacted materials.

The table below provides a breakdown of the derivation of the estimated cost for Alternative R-2.

<b>Legal Controls</b>	<b>Cost</b>
Impacted Parcel C Building Surveys/Release	\$ 1,709,500
Radiological waste disposal for building sites	\$ 100,980
Parcel C sewer and storm drain removal and disposal	\$ 22,345,714
20% Contingency	\$ 4,831,239
<b>Total Estimated Cost for Alternative R-2</b>	<b>\$ 28,987,000*</b>

*Notes:*

\* Total estimated additional cost has been rounded to the nearest thousand.

**6.10 COST ASSUMPTIONS ASSOCIATED WITH ALTERNATIVE R-3: SURVEY, DECONTAMINATION, DISPOSAL, RELEASE, CLOSE IN-PLACE, AND INSTITUTIONAL CONTROLS**

Alternative R-3 consists of decontamination of impacted buildings, except for Building 205, dismantlement if necessary, and radiological surveys to ensure the remedial action objectives are met. This alternative assumes that the Building 205 shaft below 10 feet would be closed in-place with backfilled stone and a concrete cap and ICs will be assigned. This alternative assumes that trenches resulting from sewer and storm line removal, and remediated storm drain and sanitary sewer piping will be surveyed to meet the remediation goals.

The following assumptions apply to Alternative R-3:

1. Each building (203, 211, 214, 224, 241, 253, 271, and 272) will be divided into 31 MARSSIM survey units. Building 205 will be divided into 15 MARSSIM survey units except for the shaft below 10 feet. The Building 205 shaft below 10 feet will not be released. It will be closed in-place with stone and a concrete cap with ICs implemented. The ICs for Building 205 are assumed to add no additional cost to the ICs already proposed for Parcel C. The cost for developing the survey plans, performing the survey, and drafting the report is \$6,500 per survey unit.
2. Each building (203, 211, 214, 224, 241, 253, 271, and 272) is assumed to generate one disposal bin of material (e.g., flooring, ventilation piping, etc.). The assumed disposal cost of \$11,880 per bin results in a total cost of \$95,400.

3. Building 205 will be divided into 15 MARSSIM survey units except for the shaft below 10 feet. The Building 205 estimated volume to be backfilled in place is 4,810 cy. This volume will be filled with 7,200 tons of ¾-inch minus stone (#57 in most states) and 415 cy (6-ft thickness estimated) of concrete. Modifications would have to be completed to the building to facilitate access and dumping of the materials. The discharge channel would have to be opened and the drydock inlets sealed to eliminate impacts to the bay. It is estimated that at least one month of preparation time is needed prior to the backfilling activity. The estimated costs are as follows: \$32 per ton for stone, \$270 per cy for concrete, and \$250,000 for labor, construction management, equipment, and tool rental. These estimates result in a total estimated cost of \$592,450.
4. Removal of the Parcel C sewer and storm drain systems is estimated to result in 60,000 cy of material to be excavated at an estimated cost of \$330 per cy. This results in a total excavation cost of \$19,800,000.
5. It is assumed that 5 percent of the material excavated during the Parcel C sewer and storm drain system removal will be radiologically impacted resulting in approximately 3,000 cy of material. The cost of disposal is assumed to be \$11,880 per bin, and based on 14 cy of soil per bin; the total disposal cost is estimated to be \$2,542,714. Note this does not include cost associated with disposal of CERCLA-impacted materials.

The table below provides a breakdown of the estimated cost for Alternative R-3.

Impacted Parcel C Building Surveys/Release Except for Building 205	\$ 1,709,500
Backfill of Building 205 shaft below 10 feet with stone and concrete cap	\$ 592,450
Radiological waste disposal for building sites	\$ 100,980
Parcel C sewer and storm drain removal and disposal	\$ 22,345,714
20% Contingency	\$ 4,949,729
<b>Total Estimated Cost for Alternative R-3</b>	<b>\$ 29,698,000*</b>

*Notes:*

- \* Total estimated cost has been rounded to the nearest thousand.

## 7.0 SUMMARY

The total cost for each alternative is summarized below.

Alternative Name and Description	Estimated Cost <sup>a</sup>
Alternative S-1 – No Action	\$0
Alternative S-2 – Institutional Controls and Maintained Landscaping	\$0 <sup>b</sup>
Alternative S-3 – Excavation, Disposal, Maintained Landscaping, and Institutional Controls	\$0 <sup>b</sup>
Alternative S-4 – Covers and Institutional Controls	\$0 <sup>b</sup>
Alternative S-5 – Excavation, Disposal, Covers, and Institutional Controls	\$0 <sup>b</sup>
Alternative GW-1 – No Action	\$0
Alternative GW-2 – Long-Term Monitoring of Groundwater and Institutional Controls	\$1,172,000 <sup>b</sup>
Alternative GW-3A – In-Situ Bioremediation, Long-term Groundwater Monitoring, and Institutional Controls	\$2,281,000 <sup>b</sup>
Alternative GW-3B – In-Situ Zero-Valent Iron Reduction, Bioremediation, Long-term Groundwater Monitoring, and Institutional Controls	\$2,344,000 <sup>b</sup>
Alternative R-1 – No Action	\$0
Alternative R-2 – Survey, Decontamination, Disposal, and Release	\$28,987,000
Alternative R-3 – Survey, Decontamination, Disposal, Release, and Institutional Controls	\$29,698,000

**Notes:**

<sup>a</sup> Rounded to the nearest thousand dollars

<sup>b</sup> Additional cost above the remediation of chemicals of concern for radiological work

## 8.0 REFERENCES

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- SSulTech. 2007. *Revised Feasibility Study Report for Parcel C*. SulTech. 1230 Columbia Street, Suite 1000, SD, CA. September 17.
- U.S. Environmental Protection Agency (EPA). 2000. 540-R-00-002 OSWER 9355.0-75 A Guide to Developing and Documenting Cost Estimates During the Feasibility Study.

**APPENDIX C**

**APPLICABLE OR RELEVANT AND  
APPROPRIATE REQUIREMENTS**

**Base Realignment and Closure  
Program Management Office West  
1455 Frazee Road, Suite 900  
San Diego, California 92108-4310  
CONTRACT NO. N62473-06-D-2201  
CTO No. 0006**

**APPENDIX C  
FINAL  
APPLICABLE OR RELEVANT  
AND APPROPRIATE REQUIREMENTS  
June 20, 2008**

**PARCEL C, HUNTERS POINT SHIPYARD  
SAN FRANCISCO, CALIFORNIA**

**DCN: ECSD-2201-0006-0077**



**TETRA TECH EC, INC.**

**1230 Columbia Street, Suite 750  
San Diego, CA 92101-8536**

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## ABBREVIATIONS AND ACRONYMS

§	Section
AEA	Atomic Energy Act
ALARA	as low as reasonably achievable
ARAR	applicable or relevant and appropriate requirement
CCR	California Code of Regulations
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	Code of Federal Regulations
cm	centimeter
DOE	Department of Energy
DON	Department of the Navy
DTSC	Department of Toxic Substances Control
EPA	U.S. Environmental Protection Agency
FS	Feasibility Study
HPS	Hunters Point Shipyard
IC	institutional control
LLRW	low-level radioactive waste
LLWPA	Low-Level Radioactive Waste Policy Act
LTP	License Termination Plan
MCL	Maximum Contaminant Level
mrem	millirem
mrem/y	millirem per year
mSv	millisievert
NARM	naturally occurring and accelerator-produced radioactive material
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NESHAPS	National Emissions Standards for Hazardous Air Pollutants
NORM	naturally occurring radioactive material
NRC	Nuclear Regulatory Commission
pCi/g	picocurie per gram
<sup>226</sup> Ra	radium-226
RAO	Remedial Action Objective

## **ABBREVIATIONS AND ACRONYMS**

**(Continued)**

RCRA	Resource Conservation and Recovery Act
RG	remediation goal
ROC	radionuclide of concern
ROD	Record of Decision
TBC	to be considered
TEDE	total effective dose equivalent
TENORM	technically enhanced naturally occurring radioactive material
UMTRCA	Uranium Mill Tailings Radiation Control Act
U.S.C.	United States Code

## 1.0 PURPOSE

This appendix identifies and evaluates potential federal and State of California applicable or relevant and appropriate requirements (ARARs), based on regulations, requirements, and guidance, and sets forth the Department of the Navy (DON) determinations on those potential ARARs for each remedial action alternative retained for detailed analysis in this radiological addendum to the Revised Feasibility Study (FS) Report for Parcel C, San Francisco, California (SulTech, 2007).

This evaluation includes an initial determination of whether the potential ARARs actually qualify as ARARs, and a comparison for stringency between the federal and state regulations to identify the controlling ARARs. The identification of ARARs is an iterative process. The final determination of ARARs will be made by the DON in the Record of Decision (ROD) or Action Memorandum, after public review, as part of the response action selection process.

### 1.1 SUMMARY OF CERCLA AND NATIONAL OIL AND HAZARDOUS SUBSTANCES POLLUTION CONTINGENCY PLAN REQUIREMENTS

Section 121(d) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA, 42 United States Code [U.S.C.], Section 9621[d]), as amended, states that remedial actions on CERCLA sites must attain (or the decision document must justify the waiver of) any federal or more stringent state environmental standards, requirements, criteria, or limitations that are determined to be legally applicable or relevant and appropriate.

Applicable requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that specifically address the situation at a CERCLA site. The requirement is applicable if the jurisdictional prerequisites of the standard show a direct correspondence when objectively compared to the conditions at the site. An applicable federal requirement is an ARAR. An applicable state requirement is an ARAR only if it is more stringent than federal ARARs.

If the requirement is not legally applicable, then it is evaluated to determine whether it is relevant and appropriate. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that, while not applicable, address problems or situations similar to the circumstances of the proposed response action and are well suited to the conditions of the site (U.S. Environmental Protection Agency (EPA), 1988). A requirement must be determined to be both relevant and appropriate in order to be considered an ARAR. The criteria for determining relevance and appropriateness are listed in 40 Code of Federal Regulations (CFR) 300.400(g)(2) and include the following:

- The purpose of the requirement and the purpose of the CERCLA action.
- The medium regulated or affected by the requirement and the medium contaminated or affected at the CERCLA site.
- The substances regulated by the requirement and the substances found at the CERCLA site.
- The actions or activities regulated by the requirement and the response action contemplated at the CERCLA site.
- Any applicable variances, waivers, or exemptions from the requirement and their availability for the circumstances at the CERCLA site.
- The type of place regulated and the type of place affected by the release or CERCLA action.
- The type and size of structure or facility regulated and the type and size of structure or facility affected by the release or contemplated by the CERCLA action.
- Any consideration of use or potential use of affected resources in the requirement and the use or potential use of the affected resources at the CERCLA site.

According to CERCLA ARAR guidance (EPA, 1988), a requirement may be “applicable” or “relevant and appropriate,” but not both. Identification of ARARs must be done on a site-specific basis and involve a two-part analysis: first, a determination whether a given requirement is applicable, and second, when the analysis determines that a requirement is both relevant and appropriate, compliance with such a requirement must be to the same degree as if it were applicable (EPA, 1988).

Tables included in this appendix present each potential ARAR with an initial determination of ARAR status (i.e., applicable, relevant and appropriate, to be considered, or not an ARAR). For the determination of relevance and appropriateness, the pertinent criteria were examined to determine whether the requirements addressed problems or situations sufficiently similar to the circumstances of the release of response action contemplated, and whether the requirement was well suited to the site. A negative determination of relevance and appropriateness indicates that the requirement did not meet the pertinent criteria. Negative determinations are documented in the tables of this appendix.

To qualify as a state ARAR under CERCLA and National Oil and Hazardous Substances Pollution Contingency Plan (NCP), a state requirement must be:

- A state law or regulation.
- An environmental or facility siting law or regulation.
- Promulgated (of general applicability and legally enforceable).
- Substantive (not procedural or administrative).
- More stringent than federal requirements.

- Identified in a timely manner
- Consistently applied.

To constitute an ARAR, a requirement must be substantive. Therefore, only the substantive provisions of requirements identified as ARARs in this analysis are considered ARARs. Permits are considered procedural or administrative requirements. Provisions of generally relevant federal and state statutes and regulations that were determined to be procedural or non-environmental, including permit requirements, are not considered ARARs. CERCLA 121(e)(1), Title 42 U.S.C., Section 9621(e)(1), states “No Federal, State, or local permit shall be required for the portion of any removal or remedial action conducted entirely on-site, where such remedial action is selected and carried out in compliance with this section.” The term “on-site” is defined for this ARAR discussion as “the areal extent of contamination and all suitable areas in very close proximity to the contamination necessary for implementation of the response action” (40 CFR 300.5).

Non-promulgated advisories or guidance issued by the federal or state governments are not legally binding and do not have the status of ARARs. Such requirements may, however, be useful, and are “to be considered” (TBC). TBC requirements complement ARARs but do not override them (40 CFR 300.4700[g][3]). They are useful for guiding decisions regarding cleanup goals or methodologies when regulatory standards are not available.

Pursuant to EPA guidance (EPA, 1988), ARARs are generally divided into three categories: chemical-specific, location-specific, and action-specific requirements. These classifications were developed to aid in identifying ARARs; some ARARs do not fall precisely into one group or another. ARARs are identified on a site-specific basis for remedial actions where CERCLA authority is the basis for cleanup.

As the lead federal agency, the DON has primary responsibility for identifying federal ARARs at Parcel C. Potential federal ARARs are discussed in Section 1.2.2. Pursuant to the definition of on-site in 40 CFR 300.5, the on-site areas that are part of this action include all of Parcel C.

Identification of potential state ARARs was initiated through DON requests that the California Department of Toxic Substances Control (DTSC), the Regional Water Quality Control Board (Water Board, San Francisco Bay), and the San Francisco Bay Conservation and Development Commission identify potential state ARARs. Potential state ARARs that have been identified for Parcel C are discussed below.

## **1.2 DESCRIPTION OF METHODOLOGY**

The process of identifying and evaluating potential federal and state ARARs is described in this subsection.

## 1.2.1 General

As the lead federal agency, the DON has primary responsibility to identify potential ARARs for Parcel C. In preparing this ARARs analysis, the DON undertook the following measures, consistent with CERCLA and the NCP:

- Identified potential federal ARARs for each response action alternative in this Radiological Addendum to the Revised FS Report for Parcel C, taking into account site-specific information for Parcel C
- Reviewed potential ARARs identified by the state to determine whether they satisfied CERCLA and NCP criteria that must be met to constitute state ARARs
- Evaluated and compared federal ARARs and their state counterparts to determine whether state ARARs were more stringent than the federal ARARs or were in addition to the federally required actions
- Reached a conclusion as to which federal and state ARARs were the most stringent or “controlling” for each alternative

Section 4.1 of this Radiological Addendum to the Revised FS Report for Parcel C discusses and presents the remedial action objectives (RAOs) for the remedial actions at Parcel C. The RAOs for the radionuclides of concern (ROCs) are:

- Prevent or reduce exposure to ROCs in impacted buildings and remediated storm drain and sanitary sewer piping above cleanup goals developed and shown in Table 3-2 of this Radiological Addendum to the Revised FS Report for Parcel C for the following pathways:
  - Direct exposure to gamma radiation.
  - Ingestion of radioactive contaminants.
  - Inhalation of radioactive contaminants.

The alternatives for performing the RAOs that are evaluated in this Radiological Addendum to the Revised FS Report for Parcel C are:

- Alternative S-1 – No Action.
- Alternative S-2 – Institutional Controls and Maintained Landscaping.
- Alternative S-3 – Excavation, Disposal, Maintained Landscaping, and Institutional Controls.
- Alternative S-4 – Covers and Institutional Controls.
- Alternative S-5 – Excavation, Disposal, Covers, Soil Vapor Extraction, and Institutional Controls.
- Alternative GW-1 – No Action.

- Alternative GW-2 – Long-term Monitoring of Groundwater and Institutional Controls.
- Alternative GW-3A – In-Situ Bioremediation, Long-Term Groundwater Monitoring, and Institutional Controls.
- Alternative GW-3B – In-Situ Zero-Valent Iron Reduction, Bioremediation, Long-Term Groundwater Monitoring, and Institutional Controls.
- Alternative R-1 – No Action.
- Alternative R-2 – Survey, Decontamination, Disposal, Release, and Institutional Controls.
- Alternative R-3 - Survey, Decontamination, Disposal, Release, Close In-Place, and Institutional Controls.

### **1.2.2 Identifying and Evaluating Federal ARARs**

The DON is responsible for identifying federal ARARs as the lead federal agency under CERCLA and the NCP. The final determination of federal ARARs will be made when the DON issues the ROD. The federal government implements a number of federal environmental statutes that are the source of potential federal ARARs, either in the form of the statutes or regulations. Examples include the Resource Conservation and Recovery Act, the Clean Water Act, the Safe Drinking Water Act, the Toxic Substances Control Act, and their implementing regulations.

The components of the proposed response action were reviewed to determine if they were applicable or relevant and appropriate using the CERCLA and NCP criteria and procedures for ARARs identification by lead federal agencies.

EPA guidance recommends that the lead federal agency consult with the state when identifying state ARARs for remedial actions (EPA, 1988). In essence, the CERCLA and NCP requirements for remedial actions in 40 CFR 300.515 provide that the lead federal agency request that the state identify chemical-specific and location-specific state ARARs upon completion of site characterization. The requirements also provide that the lead federal agency request identification of all categories of state ARARs (chemical-, location-, and action-specific) upon completion of identification of remedial alternatives for detailed analysis. As part of the agreement, the DON is responsible for identifying potential federal ARARs, and DTSC is responsible for coordinating with state and local governmental agencies and identifying potential state ARARs.

## **2.0 CHEMICAL-SPECIFIC ARARs**

Chemical-specific ARARs are generally health- or risk-based numerical values or methodologies applied to site-specific conditions that result in establishment of a cleanup goal. Many potential ARARs associated with particular response alternatives (such as closure or discharge) can be characterized as action-specific, but include numerical values or methodologies to establish them so they fit both chemical- and action-specific categories.

This section presents ARARs addressing numerical values for the cleanup of radiologically contaminated equipment, structures, and air. Potential federal and state chemical-specific ARARs are summarized in Tables C.2-1 and C.2-2 at the end of this appendix.

### **2.1 POTENTIAL FEDERAL AND CALIFORNIA STATE CHEMICAL-SPECIFIC ARARs**

#### **2.1.1 Radioactive Waste Categorization**

##### **Low-Level Radioactive Waste**

The definition of low-level radioactive waste (LLRW) is found within Nuclear Regulatory Commission (NRC) licensing regulations. It encompasses materials that are slightly above natural radiation background levels to highly radioactive materials that require extreme caution when handling. The term “low-level radioactive waste” means radioactive material that: 1) is not high-level radioactive waste, spent nuclear fuel, or byproduct material (the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content) and 2) the NRC classifies as low-level radioactive waste (LLRW Policy Act at Title 42 U.S.C. §§ 2021[b][9] and 2014[e][2]).

Low-level radioactive waste includes items with radioactive material or materials that have become radioactive through exposure to neutron radiation. This waste typically consists of contaminated protective shoe covers and clothing, wiping rags, mops, filters, reactor water treatment residues, equipment and tools, luminous dials (containing tritium or other non-radium radionuclides), medical tubes, swabs, injection needles, syringes, and laboratory animal carcasses and tissues. The radioactivity can range from just above naturally occurring background levels to very high levels. LLRW does not include naturally occurring and accelerator-produced radioactive material (see below).

##### **Naturally Occurring and Accelerator-Produced Radioactive Waste**

Naturally occurring and accelerator-produced radioactive material (NARM) is a broad category that includes accelerator-produced radioactive material and naturally occurring radioactive material (NORM), but does not include source, special nuclear, or by-product material. NORM

is a subset of NARM. Accelerator-produced radioactive materials (the “A” in NARM) include wastes generated by accelerators used in subatomic particle physics research.

The term technically enhanced NORM (TENORM) refers to NORM whose radioactivity has been enhanced (i.e., NORM whose radionuclide concentrations are either increased or redistributed compared to typical background levels either naturally or as the result of human intervention or processes). Examples are exploration and production wastes from the oil and natural gas industries and phosphate slag piles from the phosphate mining industry.

Currently, no federal regulations specifically control NARM (NRC regulations do not include NARM at this time). However, numerous federal laws do regulate parts of the NORM/TENORM industry. An example is the maximum contaminant level (MCL) for radium.

### **2.1.2 Authority and Responsibility for Radioactive Waste**

The Atomic Energy Act (AEA), as amended, is the basic law governing production, use, ownership, disposal of, and liability for radioactive materials in the United States. A number of laws also specify radioactive waste-management procedures and authorities. In 1980, Congress passed the Low-Level Radioactive Waste Policy Act (LLWPA; amended in 1985, LLWPA Amendment) which stipulated disposal of non-Department of Energy (DOE) LLRW a responsibility of the states and the disposal of commercial transuranic waste and “greater than Class C” LLRW (see Title 10 CFR 61.55 for waste categories) a federal responsibility. According to these laws, the EPA must set radiation protection standards for disposal of LLRW, supplementing standards set by the NRC. However, the EPA has not as yet established this regulation. Recent amendments to the AEA, in the Energy Policy Act of 2005, have brought radium-226 (<sup>226</sup>Ra), NARM, and NORM under the jurisdiction of the NRC.

In California, regulation of NARM disposal currently rests with the State of California as part of its authority as an Agreement State for ensuring the protection of public health and safety. Even though the state has the authority, the state regulations must be more stringent than the federal ARARs to be potential ARARs.

Responsibilities for management of nuclear materials, including radioactive wastes, are defined in the above-mentioned laws passed by Congress. These laws are administered by government agencies that codify the details in the CFR, in guidance documents, and in internal orders. Responsibilities for action, monitoring, enforcement, and setting standards are divided between several agencies. DOE, EPA, NRC, and the Department of Transportation (DOT) are all involved in different aspects of radioactive waste management for DOE projects on the federal level. Management of wastes from other generators involves the same agencies and includes DOE for high-level waste and greater-than-Class-C LLRW.

Using AEA authority, the NRC and DOE regulate mixed waste with regard to radiation safety. Using Resource Conservation and Recovery Act (RCRA) authority, EPA regulates mixed waste with regard to hazardous waste safety. Once a waste is determined to be a mixed waste, the DON must comply with both AEA and RCRA statutes and regulations. The requirements of RCRA and AEA are generally consistent and compatible.

### **California Radioactive Waste Categorization**

State radioactive waste standards are provided at California Code of Regulations (CCR) Title 17 § 30253. There is no contaminated soil at Parcel C, hence there are no potential ARARs based on California Radioactive Waste Categorization.

### **NRC Standards for Protection Against Radiation**

The substantive radiological criteria for termination of a license for an existing NRC-licensed site contaminated with radioactive waste when future unrestricted use is proposed are found at 10 CFR 20.1402. These regulations provide that a site will be considered acceptable for unrestricted use if the residual radioactivity that is distinguishable from (i.e., greater than) background radiation results in a total effective dose equivalent (TEDE) of 25 millirems (mrem) (0.25 milliSievert [mSv]) per year or less to an average member of the critical group, including that contributed from groundwater sources of drinking water, and that the residual radioactivity has been reduced to levels that are as low as reasonably achievable (ALARA). The TEDE is the sum of the deep-dose equivalent (for external exposures) and the committed effective dose equivalent (for internal exposures). These criteria apply only to ancillary surface facilities that support radioactive waste disposal activities regulated, as discussed earlier, under 10 CFR 61.

The radium at Parcel C is similar to radioactive waste regulated at an NRC site. The substantive provisions of 10 CFR 20.1402 are potentially relevant and appropriate for an unrestricted land-use scenario at Parcel C (all Parcel C-impacted sites). U.S. EPA does not believe this NRC regulation is protective of human health and the environment, and the HPS cleanup goals are more protective. This regulation is an ARAR only for radiologically-impacted sites that are undergoing TCRA and any additional remedial action required for those sites. It is not an ARAR for radiologically-impacted sites, buildings, or structures that will be transferred with engineering and institutional controls for radiological contaminants.

### **NRC Radiation Dose Limits for Individual Members of the Public**

Radiation dose limits for the public are required in the substantive provisions of 10 CFR 20.1301. This section requires that the TEDE to individual members of public not exceed 100 millirems per year (mrem/y) from licensed operations.

NRC licenses the following activities:

- Construction, operation, and decommissioning of commercial reactors and fuel cycle facilities.
- Possession, use, processing, exporting, and certain aspects of transporting nuclear materials and waste.
- Siting, design, construction, operations, and closure of waste disposal sites.

The proposed alternatives for Parcel C include leaving radioactive waste on site but not licensing the waste disposal site. Since the proposed action is not similar to the regulated activity of closure of waste disposal sites (not an NRC license), the substantive radiation dose limits for the public at 10 CFR §20.1301 are not potentially relevant and appropriate.

### **Uranium Mill Tailings Radiation Control Act**

The Uranium Mill Tailings Radiation Control Act (UMTRCA) standards are not applicable to HPS because it is not a mill site to which the UMTRCA standards apply. Specific UMTRCA requirements are only evaluated as to whether they are potentially relevant and appropriate for the remedial action at HPS.

Substantive requirements for cleanup of radioactive contaminants are found in UMTRCA standards for land and buildings contaminated with residual radioactive materials from inactive uranium processing sites.

The criteria of 10 CFR 40 Appendix A, Part I, Criterion 6(6) provide a benchmark approach for setting radionuclide cleanup levels as a supplement to 40 CFR 192.

The substantive provisions of 40 CFR 192.12(b)(1) and 192.41(b) are not determined to be potentially relevant and appropriate to the building structures at Parcel C because radium contamination is not proposed to be left in buildings.

A concentration limit for gamma radiation in buildings at inactive uranium processing sites designated for remedial action is provided at 40 CFR 192.12(b)(2). This requirement states that the level of gamma radiation in any occupied or habitable building shall not exceed the background level by more than 20 microroentgens per hour.

### **NESHAPS Requirements for Radionuclides**

Emission limitations are provided under National Emissions Standards for Hazardous Air Pollutants (NESHAPs) for facilities owned or operated by the DOE that emit radionuclides other than radon-222 and radon-220 into the air. Under 40 CFR 61 Subpart H 61.92, emissions of radionuclides into the ambient air from DOE facilities shall not exceed those amounts that would cause any member of the public to receive in any year an effective dose equivalent of 10 mrem/y.

Under 40 CFR 61 Subpart I 61.102, emissions of iodine into the ambient air from a facility regulated under this subpart shall not exceed those amounts that would cause any member of the

public to receive in any year an effective dose equivalent of 3 mrem/y. Similarly, emissions of all radionuclides (including iodine), shall not exceed amounts that would cause an effective dose equivalent of 10 mrem/y.

These requirements are limited to the cleanup action at a CERCLA site. Part II of the CERCLA Compliance with Other Laws Manual states:

*“...these subparts (Subparts H and I) would not be applicable or relevant and appropriate for airborne emissions from residual contamination after cleanup, when the facility is no longer in operation (the standards were developed to limit radiation doses caused by operations that yield a beneficial product).”*

Therefore, after removal or handling of radionuclide waste at a site, the requirements under Subparts H and I of 40 CFR 61 are not ARARs.

### **Remedial Action with Release of the Site for Unrestricted Radiological Use**

This remedial action alternative is conducted to release a site for unrestricted reuse. The potential federal ARARs are contained in NRC’s Radiological Criteria for Unrestricted Use at 10 CFR 20.1402. The substantive provisions of the following regulation are potential ARARs:

*“A site will be considered acceptable for unrestricted use if the residual radioactivity that is distinguishable for background radiation results in a total effective dose equivalent (TEDE) to an average member of the critical group that dose not exceed 25 millirems per year including that from groundwater sources of drinking water, and that the residual radioactivity has been reduced to levels that are as low as reasonably achievable (ALARA).”*

U.S. EPA does not believe this NRC regulation is protective of human health and the environment, and the HPS cleanup goals are more protective. This regulation is an ARAR only for radiologically-impacted sites that are undergoing TCRA and any additional remedial action required for those sites. It is not an ARAR for radiologically-impacted sites, buildings, or structures that will be transferred with engineering and institutional controls for radiological contaminants.

### **3.0 LOCATION-SPECIFIC ARARs**

Potential location-specific ARARs are identified and discussed in this section and are presented in Table C.3-1, included at the end of this appendix.

#### **3.1 SUMMARY OF LOCATION-SPECIFIC ARARs**

Eight protected resource categories are associated with location-specific ARARs: 1) cultural resources, 2) wetlands protection, 3) floodplain management, 4) hydrological resources, 5) biological resources, 6) coastal resources, 7) other natural resources, and 8) geologic characteristics. Cultural and coastal resources are the only categories of protected resources affected by the radiological response actions at Parcel C.

##### **3.1.1 Potential Federal and State Location-specific ARARs**

The only federal and State ARAR that is not specified in the Revised FS Report for Parcel C (SulTech, 2007) is the following:

16 U.S.C., Sections 470-470x-6, 36 CFR 800, 40 CFR 6.301(b) require that action preserve historic properties, planning of action to minimize harm to properties listed on or eligible for listing on the national Register of Historic Places. The cultural sites that has been suggested as eligible historical sites are Buildings 205 and 253 (SulTech, 2006).

## **4.0 ACTION-SPECIFIC ARARs**

The DON is evaluating several alternatives for the remediation of radionuclides from Parcel C. The requirements determined to be pertinent to each alternative being evaluated for the Parcel C action are discussed in this section. Table C.4-1, included at the end of this appendix, presents the potential action-specific ARARs.

Action-specific ARARs are technology- or activity-based requirements or limitations for remedial activities. These requirements are triggered by the specific remedial activities conducted at the site and indicate how a selected remedial alternative should be achieved. The DON has identified potential action-specific ARARs for impacted Parcel C buildings and structures alternatives evaluated in this radiological addendum to the Revised FS Report for Parcel C.

### **4.1 REMEDIAL ALTERNATIVES FOR RADIONUCLIDES**

The Revised FS Report for Parcel C identifies five soil and three groundwater alternatives for impacted sites in Parcel C. This addendum presents three alternatives for radiologically-impacted sites. Parcel C alternatives are described in the following sections.

#### **4.1.1 Alternative S-1, GW-1, and R-1 – No Action**

There is no need to identify action-specific ARARs for the no-action alternative because ARARs apply to “any removal or remedial action conducted entirely “on-site” and “no action” is not a removal or remedial action.

#### **4.1.2 Alternative S-2 – Institutional Controls and Maintained Landscaping**

Under this alternative, the DON would install ICs that would be applied to all of the redevelopment blocks resulting in an unacceptable risk. These ICs would restrict use of the soils to approved ROD amendment activities.

##### **4.1.2.1 Potential Federal and State Chemical-specific ARARs**

There are no additional federal or state chemical-specific ARARs that are applicable for Alternative S-2 that are not already referenced in the Revised FS Report for Parcel C (SulTech, 2007).

##### **4.1.2.2 Potential Federal and State Location-specific ARARs**

There are no additional federal or state location-specific ARARs for Alternative S-2 that are not already referenced in the Revised FS Report for Parcel C (SulTech, 2007).

#### **4.1.2.3 Potential Federal and State Action-specific ARARs**

There are no additional federal or state action-specific ARARs for Alternative S-2 that are not already referenced in the Revised FS Report for Parcel C (SulTech, 2007).

#### **4.1.3 Alternative S-3: Excavation, Disposal, Institutional Controls, and Maintained Landscaping**

Under this alternative, the DON would perform removal of chemicals of concern in soils. Institutional controls would be implemented for the soils to prevent exposure resulting in an unacceptable risk. These ICs would restrict use of the soils to approved ROD amendment activities.

##### **4.1.3.1 Potential Federal and State Chemical-specific ARARs**

There are no additional federal or state chemical-specific ARARs that are applicable for Alternative S-3 that are not already referenced in the Revised FS Report for Parcel C (SulTech, 2007).

##### **4.1.3.2 Potential Federal and State Location-specific ARARs**

There are no additional federal or state location-specific ARARs for Alternative S-3 that are not already referenced in the Revised FS Report for Parcel C (SulTech, 2007).

##### **4.1.3.3 Potential Federal and State Action-specific ARARs**

There are no additional federal or state action-specific ARARs for Alternative S-2 that are not already referenced in the Revised FS Report for Parcel C (SulTech, 2007).

#### **4.1.4 Alternative S-4 – Covers and Institutional Controls**

Under this alternative, the DON would install covers over the entire redevelopment blocks. Institutional controls would be implemented for the soils to prevent exposure resulting in an unacceptable risk. These ICs would restrict use of the soils to approved ROD amendment activities.

##### **4.1.4.1 Potential Federal and State Chemical-specific ARARs**

There are no additional federal or state chemical-specific ARARs that are applicable for Alternative S-4 that are not already referenced in the Revised FS Report for Parcel C (SulTech, 2007).

##### **4.1.4.2 Potential Federal and State Location-specific ARARs**

There are no additional federal or state location-specific ARARs for Alternative S-4 that are not already referenced in the Revised FS Report for Parcel C (SulTech, 2007).

#### **4.1.4.3 Potential Federal and State Action-specific ARARs**

There are no additional federal or state action-specific ARARs for Alternative S-2 that are not already referenced in the Revised FS Report for Parcel C (SulTech, 2007).

#### **4.1.5 Alternative S-5 – Excavation, Disposal, Covers, Soil Vapor Extraction, and Institutional Controls**

Under this alternative, the DON would remove any potentially present chemicals of concern above the cleanup goals in soils.

##### **4.1.5.1 Potential Federal and State Chemical-specific ARARs**

There are no additional federal or state chemical-specific ARARs that are applicable for Alternative S-5 that are not already referenced in the Revised FS Report for Parcel C (SulTech, 2007).

##### **4.1.5.2 Potential Federal and State Location-specific ARARs**

There are no additional federal or state location-specific ARARs for Alternative S-5 that are not already referenced in the Revised FS Report for Parcel C (SulTech, 2007).

##### **4.1.5.3 Potential Federal and State Action-specific ARARs**

There are no additional federal or state action-specific ARARs for Alternative S-2 that are not already referenced in the Revised FS Report for Parcel C (SulTech, 2007).

#### **4.1.6 Alternative GW-2: Institutional Controls and Long-Term Groundwater Monitoring**

Alternative GW-2 consists of groundwater monitoring and ICs. This alternative was developed as a method for monitoring contaminants present at low concentrations in groundwater. Groundwater monitoring for the ROCs will be used to confirm site conditions and ensure that, over time, the potential exposure pathway remains incomplete.

##### **4.1.6.1 Potential Federal and State Chemical-specific ARARs**

There are no additional federal or state chemical-specific ARARs for Alternative GW-2 that are not already referenced in the Revised FS Report for Parcel C (SulTech, 2007).

##### **4.1.6.2 Potential Federal and State Location-specific ARARs**

There are no additional federal or state location-specific ARARs for Alternative GW-2 that are not already referenced in the Revised FS Report for Parcel C (SulTech, 2007).

#### **4.1.6.3 Potential Federal and State Action-specific ARARs**

There are no additional federal or state action-specific ARARs for Alternative GW-2 that are not already referenced in the Revised FS Report for Parcel C (SulTech, 2007).

#### **4.1.7 Alternatives GW-3A: In-Situ Bioremediation, Long-Term Groundwater Monitoring, and Institutional Controls**

Alternative GW-3A consists of in-situ treatment of the contaminant plumes in addition to groundwater monitoring and ICs similar to Alternative GW-2. Groundwater monitoring for the ROCs will be used to confirm site conditions and ensure that, over time, the potential exposure pathway remains incomplete.

##### **4.1.7.1 Potential Federal and State Chemical-specific ARARs**

There are no additional federal or state chemical-specific ARARs for Alternative GW-3A that are not already referenced in the Revised FS Report for Parcel C (SulTech, 2007).

##### **4.1.7.2 Potential Federal and State Location-specific ARARs**

There are no additional federal or state location-specific ARARs for Alternative GW-3A that are not already referenced in the Revised FS Report for Parcel C (SulTech, 2007).

##### **4.1.7.3 Potential Federal and State Action-specific ARARs**

There are no additional federal or state action-specific ARARs for Alternative GW-3A that are not already referenced in the Revised FS Report for Parcel C (SulTech, 2007).

#### **4.1.8 Alternative GW-3B: In-Situ Zero-Valent Iron Reduction, Bioremediation, Long-Term Groundwater Monitoring, and Institutional Controls**

Alternative GW-3B consists of in-situ treatment of the contaminant plumes in addition to groundwater monitoring and ICs similar to Alternative GW-2. Groundwater monitoring for the ROCs will be used to confirm site conditions and ensure that, over time, the potential exposure pathway remains incomplete.

##### **4.1.8.1 Potential Federal and State Chemical-specific ARARs**

There are no additional federal or state chemical-specific ARARs for Alternative GW-3B that are not already referenced in the Revised FS Report for Parcel C (SulTech, 2007).

##### **4.1.8.2 Potential Federal and State Location-specific ARARs**

There are no additional federal or state location-specific ARARs for Alternative GW-3B that are not already referenced in the Revised FS Report for Parcel C (SulTech, 2007).

### **4.1.8.3 Potential Federal and State Action-specific ARARs**

There are no additional federal or state action-specific ARARs for Alternative GW-3B that are not already referenced in the Revised FS Report for Parcel C (SulTech, 2007).

### **4.1.9 Alternative R-2: Survey, Decontamination, Disposal, and Release**

Under Alternative R-2 remedial actions will be taken to remove ROCs that are present at radiologically-impacted buildings and storm drain and sanitary sewer piping above the remediation goals (RGs). These remedial actions may consist of decontamination of radiologically-impacted buildings and dismantlement of building structures if necessary. The buildings, except for Building 205, will be surveyed to verify that no residual radioactivity is present above the RGs.

The above-grade portions of Building 205, the discharge tunnel, and the first 10 feet of the Building 205 Shaft will be surveyed to verify that no residual radioactivity is present above the RAOs. The Building 205 Shaft below 10 feet will be abandoned as is due to the unsound condition of the building, health and safety hazards associated with field conditions, as well as many other unknowns. Institutional controls will be implemented to minimize inadvertent contact with radiologically-impacted media.

The trenches resulting from sewer and storm line removal, and remediated storm drain and sanitary sewer piping will be surveyed to verify that residual radioactivity is not present above the RGs. The radiologically-impacted storm drains and sanitary sewers will be removed under this alternative.

#### **4.1.9.1 Potential Federal and State Chemical-specific ARARs**

Potential federal and state chemical-specific ARARs for Alternative R-2 are presented in Tables C.2-1 and C.2-2, respectively.

#### **4.1.9.2 Potential Federal and State Location-specific ARARs**

Potential federal and state location-specific ARARs for Alternative R-2 are presented in Table C.3-1.

#### **4.1.9.3 Potential Federal and State Action-specific ARARs**

Potential federal and state action-specific ARARs for Alternative R-2 are presented in Table C.4-1.

#### **4.1.10 Alternative R-3: Survey, Decontamination, Disposal, Release, Close In-Place. And Institutional Controls**

Under Alternative R-3 remedial actions will be taken to remove ROCs that are present at radiologically-impacted buildings and storm drain and sanitary sewer piping above the RGs with the exception of Building 205. These remedial actions may consist of decontamination of radiologically-impacted buildings and dismantlement of building structures if necessary. The building will be surveyed to verify that no residual radioactivity is present above the RGs.

Under this alternative the above-grade portions of Building 205, the discharge tunnel, and the first 10 feet of the Building 205 shaft will be surveyed to verify that no residual radioactivity is present above the RGs. The shaft in Building 205 below 10 feet will not be remediated. The shaft below 10 feet and connecting piping will be closed in-place with backfilled stone and a concrete cap. Institutional controls will be utilized to prevent exposure to potentially unacceptable risk by the ROCs left in place.

The trenches resulting from sewer and storm line removal, and remediated storm drain and sanitary sewer piping will be surveyed to verify that residual radioactivity is not present above the RGs. The radiologically-impacted storm drains and sanitary sewers will be removed under this alternative.

##### **4.1.10.1 Potential Federal and State Chemical-specific ARARs**

Potential federal and state chemical-specific ARARs for Alternative R-3 are presented in Tables C.2-1 and C.2-2, respectively.

##### **4.1.10.2 Potential Federal and State Location-specific ARARs**

Potential federal and state location-specific ARARs for Alternative R-3 are presented in Table C.3-1.

##### **4.1.10.3 Potential Federal and State Action-specific ARARs**

Potential federal and state action-specific ARARs for Alternative R-3 are presented in Table C.4-1.

## 5.0 REFERENCES

SulTech. 2007. *Revised Feasibility Study Report for Parcel C*. SulTech: 1230 Columbia Street, Suite 1000, San Diego, CA. September 17.

U.S. Environmental Protection Agency (EPA). 1988. *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA; Interim Final*. U.S. Environmental Protection Agency Guidance. EPA 540-G-89-004. October.

## **TABLES**

TABLE C.2-1

**POTENTIAL FEDERAL CHEMICAL-SPECIFIC ARARs  
FOR HUNTERS POINT SHIPYARD PARCEL C**

Requirement	Prerequisite	Citation <sup>a</sup>	ARAR Determination	Comments
<b>Soil</b>				
<b>Resource Conservation and Recovery Act (42 U.S.C., ch. 82, §§ 6901-6991[i])<sup>b</sup></b>				
Defines RCRA hazardous waste. A solid waste is characterized as toxic, based on the TCLP, if the waste exceeds the TCLP maximum concentrations.	Waste	22 CFR 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100	Applicable	Applicable for determining whether waste is hazardous and already identified in the Revised FS for Parcel C.
<b>Toxic Substances control Act (15 U.S.C., ch. 53, §§ 2601-2692)<sup>b</sup></b>				
Regulates storage and disposal of PCB remediation waste. There are three options: (a) self-implementing on-site cleanup and disposal; (b) performance-based disposal using existing approved disposal technologies; and (c) risk-based disposal.	Soils, debris, sludge, or dredged materials contaminated with PCBs at concentrations greater than 50 ppm	40 CFR 761.61(c)	Not an ARAR	This FS is for radioactive material, not PCBs.
<b>Uranium Mill Tailings Radiation Control Act (42 U.S.C., Chapter 88, §§ 192.02, 192.12(a,b), 192.42)<sup>b</sup></b>				
Control of residual radioactive materials shall be designed to:  Be effective for up to 1,000 years, to the extent reasonably achievable, and, in any case, for at least 200 years, and,  Provide reasonable assurance that releases of <sup>222</sup> Rn from residual radioactive material into the atmosphere will not:  (1) Exceed an average release rate of 20 picocuries per square meter per second. This average shall apply over the entire surface of the disposal site and over at least a one-year period. Radon will come from both residual	Inactive Uranium Processing site	40 CFR 192.02(a), (b)	Not an ARAR	Parcel C is not an inactive uranium processing site; hence this citation is not applicable. It is highly unlikely the criteria for releases of <sup>222</sup> Rn from residual radiological material into the atmosphere would be exceeded at Parcel C.

TABLE C.2-1

**POTENTIAL FEDERAL CHEMICAL-SPECIFIC ARARs  
FOR HUNTERS POINT SHIPYARD PARCEL C**

	<b>Prerequisite</b>	<b>Citation<sup>a</sup></b>	<b>ARAR Determination</b>	<b>Comments</b>
<p>radioactive materials and from materials covering them. Radon emissions from the covering materials should be estimated as part of developing a remedial action plan for each site. The standard, however, applies only to emissions from residual radioactive materials into the atmosphere.</p> <p>or,</p> <p>(2) Increase the annual average concentration of <sup>222</sup>Rn in air at or above any location outside the disposal site by more than 0.5 picocurie per liter.</p>				
<p>Standards for cleanup of land and buildings contaminated with <sup>226</sup>Ra, <sup>228</sup>Ra, and thorium from inactive uranium processing sites.</p> <p>As a result of residual radioactive materials from any designated processing site:</p> <p>(a) The concentration of <sup>226</sup>Ra in land averaged over any area of 100 square meters shall not exceed the background level by more than:</p> <p>(1) 5 pCi/g, averaged over the first 15 cm of soil below the surface, and</p> <p>(2) 15 pCi/g, averaged over 15-cm-thick layers of soil more than 15 cm below the surface.</p>	UMTRCA sites	40 CFR 192.12(a), 192.32(b)(2) and 192.41	Relevant and Appropriate	<p>Not applicable because Parcel C is not an UMTRCA site and is not potentially relevant and appropriate for sites with soil contaminated with radioactive waste.</p> <p>The surface and subsurface concentration of 5pCi/g is potentially relevant and appropriate only for an unrestricted land-use scenario.</p>
In any occupied or habitable building, the objective of remedial action shall be, and reasonable effort shall be made to achieve, an annual average (or equivalent)	UMTRCA sites	40 CFR 192.12(b)(1) 192.41(b)	Relevant and Appropriate	Not applicable because Parcel C is not an UMTRCA site. Relevant

TABLE C.2-1

**POTENTIAL FEDERAL CHEMICAL-SPECIFIC ARARs  
FOR HUNTERS POINT SHIPYARD PARCEL C**

Requirement	Prerequisite	Citation <sup>a</sup>	ARAR Determination	Comments
radon decay product concentration (including background) not to exceed 0.02 WL. In any case, the radon decay product concentration (including background) shall not exceed 0.03 WL. Provisions applicable to <sup>222</sup> Rn shall also apply to <sup>220</sup> Rn.				and appropriate since the alternatives will result in radioactive material with radioactive contamination that may produce this level of dose.
Concentration limits for cleanup of gamma radiation in buildings at inactive uranium processing sites designated for remedial action.  In any occupied or habitable building, the level of gamma radiation shall not exceed the background level by more than 20 microrentgens per hour.	UMTRCA sites	40 CFR 192.12(b)(2)	Relevant and Appropriate	Not applicable because Parcel C is not an UMTRCA site. A potential ARAR since the alternatives will leave a building with radioactive contamination at the remedial action objective level.
<b>Radiological Criteria for License Termination</b>				
A site will be considered acceptable for unrestricted use if the residual radioactivity that is distinguishable from background radiation results in TEDE to an average member of the critical group that does not exceed 25 mrem/y, including that from groundwater sources of drinking water, and that the residual radioactivity has been reduced to ALARA.	Existing NRC-licensed radiologically contaminated site	10 CFR 20.1402	Relevant and appropriate	This ARAR is not applicable because Parcel C is not an NRC-licensed radiologically contaminated site. This ARAR is potentially relevant and appropriate for an unrestricted land-use scenario. <sup>c</sup>
A site will be considered acceptable for license termination under restricted conditions if:	Existing NRC-licensed radiologically contaminated site	10 CFR §20.1403(a),(b),(c),(d),(e)	Not an ARAR	The PRGs and remedial actions for Parcel B are protective of human health

TABLE C.2-1

**POTENTIAL FEDERAL CHEMICAL-SPECIFIC ARARs  
FOR HUNTERS POINT SHIPYARD PARCEL C**

Requirement	Prerequisite	Citation <sup>a</sup>	ARAR Determination	Comments
<p>(a) The licensee can demonstrate that further reductions in residual radioactivity necessary to comply with the provisions of § 20.1402 would result in net public or environmental harm or were not being made because the residual levels associated with restricted conditions are ALARA. Determination of the levels which are ALARA must take into account consideration of any detriments, such as traffic accidents, expected to potentially result from decontamination and waste disposal;</p> <p>(b) The licensee has made provisions for legally enforceable institutional controls that provide reasonable assurance that the TEDE from residual radioactivity distinguishable from background to the average member of the critical group will not exceed 25 mrem (0.25 mSv) per year;</p> <p>(c) The licensee has provided sufficient financial assurance to enable an independent third party, including a governmental custodian of a site, to assume and carry out responsibilities for any necessary control and maintenance of the site. Acceptable financial assurance mechanisms are--</p> <p>(1) Funds placed into an account segregated from the licensee's assets and outside the licensee's administrative control as described in § 30.35(f)(1) of this chapter;</p> <p>(2) Surety method, insurance, or other guarantee</p>				<p>and the environment and are more stringent and protective than the criteria in 10 CFR § 20.1403. Therefore, these regulations will not be carried forward in the CERCLA process as potential Federal ARARs.</p>

TABLE C.2-1

**POTENTIAL FEDERAL CHEMICAL-SPECIFIC ARARs  
FOR HUNTERS POINT SHIPYARD PARCEL C**

Requirement	Prerequisite	Citation <sup>a</sup>	ARAR Determination	Comments
<p>method as described in § 30.35(f)(2) of this chapter;</p> <p>(3) A statement of intent in the case of Federal, State, or local Government licensees, as described in § 30.35(f)(4) of this chapter; or</p> <p>(4) When a governmental entity is assuming custody and ownership of a site, an arrangement that is deemed acceptable by such governmental entity.</p> <p>(d) The licensee has submitted a decommissioning plan or License Termination Plan (LTP) to the Commission indicating the licensee's intent to decommission in accordance with §§ 30.36(d), 40.42(d), 50.82 (a) and (b), 70.38(d), or 72.54 of this chapter, and specifying that the licensee intends to decommission by restricting use of the site. The licensee shall document in the LTP or decommissioning plan how the advice of individuals and institutions in the community who may be affected by the decommissioning has been sought and incorporated, as appropriate, following analysis of that advice.</p> <p>(1) Licensees proposing to decommission by restricting use of the site shall seek advice from such affected parties regarding the following matters concerning the proposed decommissioning--</p> <p>(i) Whether provisions for institutional controls proposed by the licensee;</p> <p>(A) Will provide reasonable assurance that the TEDE</p>				

TABLE C.2-1

**POTENTIAL FEDERAL CHEMICAL-SPECIFIC ARARs  
FOR HUNTERS POINT SHIPYARD PARCEL C**

Requirement	Prerequisite	Citation <sup>a</sup>	ARAR Determination	Comments
<p>from residual radioactivity distinguishable from background to the average member of the critical group will not exceed 25 mrem (0.25 mSv) TEDE per year;</p> <p>(B) Will be enforceable; and</p> <p>(C) Will not impose undue burdens on the local community or other affected parties.</p> <p>(ii) Whether the licensee has provided sufficient financial assurance to enable an independent third party, including a governmental custodian of a site, to assume and carry out responsibilities for any necessary control and maintenance of the site;</p> <p>(2) In seeking advice on the issues identified in § 20.1403(d)(1), the licensee shall provide for:</p> <p>(i) Participation by representatives of a broad cross section of community interests who may be affected by the decommissioning;</p> <p>(ii) An opportunity for a comprehensive, collective discussion on the issues by the participants represented; and</p> <p>(iii) A publicly available summary of the results of all such discussions, including a description of the individual viewpoints of the participants on the issues and the extent of agreement and disagreement among the participants on the issues; and</p>				

TABLE C.2-1

**POTENTIAL FEDERAL CHEMICAL-SPECIFIC ARARs  
FOR HUNTERS POINT SHIPYARD PARCEL C**

Requirement	Prerequisite	Citation <sup>a</sup>	ARAR Determination	Comments
<p>(e) Residual radioactivity at the site has been reduced so that if the institutional controls were no longer in effect, there is reasonable assurance that the TEDE from residual radioactivity distinguishable from background to the average member of the critical group is as low as reasonably achievable and would not exceed either--</p> <p>(1) 100 mrem (1 mSv) per year; or</p> <p>(2) 500 mrem (5 mSv) per year provided the licensee--</p> <p>(i) Demonstrates that further reductions in residual radioactivity necessary to comply with the 100 mrem/y (1 mSv/y) value of paragraph (e)(1) of this section are not technically achievable, would be prohibitively expensive, or would result in net public or environmental harm;</p> <p>(ii) Makes provisions for durable institutional controls;</p> <p>(iii) Provides sufficient financial assurance to enable a responsible government entity or independent third party, including a governmental custodian of a site, both to carry out periodic rechecks of the site no less frequently than every 5 years to assure that the institutional controls remain in place as necessary to meet the criteria of § 20.1403(b) and to assume and carry out responsibilities for any necessary control and maintenance of those controls. Acceptable financial assurance mechanisms are those in paragraph (c) of this section.</p>				

TABLE C.2-1

**POTENTIAL FEDERAL CHEMICAL-SPECIFIC ARARs  
FOR HUNTERS POINT SHIPYARD PARCEL C**

<b>Requirement</b>	<b>Prerequisite</b>	<b>Citation<sup>a</sup></b>	<b>ARAR Determination</b>	<b>Comments</b>
Alternate criteria are allowed for license termination as long as assurance is provided that public health and safety would continue to be protected, and that it is unlikely that the dose from all man-made sources combined, other than medical, would be more than the 100-mrem/y limit of Subpart D, by submitting an analysis of possible sources of exposure; to the extent practical restrictions for on-site use are employed according to the provisions of 10 CFR 20.1403 in minimizing exposures at the site; and doses are reduced to ALARA levels, taking into consideration any detriments such as traffic accidents expected to potentially result from decontamination and waste disposal.	Existing NRC-licensed radiologically contaminated site	10 CFR, 20.1404(a)(1), (2), and (3)	Not an ARAR	The PRGs and remedial actions for Parcel C are protective of human health and the environment and are more stringent and protective than the criteria in 10 CFR § 20.1403. Therefore, these regulations will not be carried forward in the CERCLA process as potential Federal ARARs.
Requires that the TEDE to individual members of public not exceed 0.1 rem (100 mrem) from licensed operation: construction, operation, and decommissioning of commercial reactors and fuel cycle facilities; possession, use, processing, exporting, and certain aspects of transporting nuclear materials and waste; and siting, design, construction, operations, and closure of waste disposal sites.	Existing NRC-licensed radiologically contaminated site	10 CFR 20.1301(a)(1)	Not an ARAR	Since the proposed action is not similar to the regulated activity of closure of waste disposal sites (not an NRC license), the substantive radiation dose limits for the public at 10 CFR §20.1301 are not potentially relevant and appropriate.
Provides a benchmark approach for setting cleanup levels for radionuclides as a supplement to 40 CFR 192.	UMTRCA site	10 CFR 40, Appendix A, Part I, Criterion 6(6)	Not an ARAR	Not applicable because Parcel C is not an UMTRCA site.

TABLE C.2-1

**POTENTIAL FEDERAL CHEMICAL-SPECIFIC ARARs  
FOR HUNTERS POINT SHIPYARD PARCEL C**

<b>Requirement</b>	<b>Prerequisite</b>	<b>Citation<sup>a</sup></b>	<b>ARAR Determination</b>	<b>Comments</b>
Performance objectives for the land disposal of LLRW. Concentrations of radioactive material that may be released into the general environment must not result in an annual dose exceeding 25 mrem to the body or any organ of a member of the general public.	Existing NRC-licensed LLRW disposal site	10 CFR 61.41	Relevant and Appropriate	Not applicable because Parcel C is not an existing NRC-licensed LLRW disposal site.  This ARAR is potentially relevant and appropriate for a restricted land-use scenario when radioactive waste remains on site.
<b>Air</b>				
<b>Clean Air Act (42 U.S.C., ch 85, §§ 7401-7671</b>				
<b>Resource Conservation and Recovery Act Emissions Requirements (42 U.S.C., ch. 82, §§ 6901–6991[i])</b>				
Air emission standards for process vents or equipment leaks.	Air emission standards for process vents or equipment leaks.	CCR tit. 22 § 66264.1030-66264.1034, excluding 1030(c), 1033(j), 1034(c)(2), 1034(d)(2)  CCR tit. 22 § 66264.1050-66264.1063, excluding 10509c), (d), 1057(g)(2), 1060,163(d)93)	Not an ARAR	Not an ARAR since this regulation does not cover radiological constituents of concern.
<b>NESHAPs under CAA that Apply to Radionuclides</b>				
Emissions of radionuclides into the ambient air from Department of Energy facilities shall not exceed those amounts that would cause any member of the public to	Facility owned or operated by the Department of Energy that emits any radionuclide other	40 CFR 61 Subpart H, 61.92	Relevant and Appropriate	Not applicable because Parcel C is not a

TABLE C.2-1

**POTENTIAL FEDERAL CHEMICAL-SPECIFIC ARARs  
FOR HUNTERS POINT SHIPYARD PARCEL C**

Requirement	Prerequisite	Citation <sup>a</sup>	ARAR Determination	Comments
receive in any year an effective dose equivalent of 10 mrem/y.	than <sup>222</sup> Rn and <sup>220</sup> Rn into the air			Department of Energy site Potentially relevant and appropriate because potential radioactive material remains after cleanup under restricted conditions.
Emissions of radionuclides, including iodine, into the ambient air from a facility regulated under this subpart shall not exceed those amounts that would cause any member of the public to receive in any year an effective dose equivalent of 10 mrem/y. Emissions of iodine into the ambient air from a facility regulated under this subpart shall not exceed those amounts that would cause any member of the public to receive in any year an effective dose equivalent of 3 mrem/y.	Facilities owned or operated by any federal agency other than the Department of Energy and not licensed by the NRC	40 CFR 61 Subpart I 61.102	Not an ARAR	The requirements are not applicable or relevant and appropriate since there is no soil contamination.
<b>Surface Water</b>				
Concentration limits for liquid effluent from facilities that extract and process uranium, radium, and vanadium ores:  <sup>226</sup> Ra (dissolved) 10.0 pCi/L maximum per day 3.0 pCi/L average 30 days  <sup>226</sup> Ra (total) 30.0 pCi/L maximum per day 10.0 pCi/L average 30 days  Uranium 4.0 mg/L maximum per day	Discharges to surface water from certain kinds of mines and mills	40 CFR 440, Subpart C, 440.30–440.35	Not an ARAR	Not an ARAR because discharge to surface water is not a proposed action and Parcel C is not a mine or mill.

TABLE C.2-1

**POTENTIAL FEDERAL CHEMICAL-SPECIFIC ARARs  
FOR HUNTERS POINT SHIPYARD PARCEL C**

Requirement	Prerequisite	Citation <sup>a</sup>	ARAR Determination	Comments
2.0 mg/L average 30 days				
<b>Uranium Mill Tailings Radiation Control Act (42 U.S.C., Chapter 88, §§ 192.02, 192.12(a,b), 192.42)<sup>b</sup></b>				
<p>Control of residual radioactive materials shall be designed to:</p> <p>Be effective for up to 1,000 years, to the extent reasonably achievable, and, in any case, for at least 200 years, and,</p> <p>Provide reasonable assurance that releases of <sup>222</sup>Rn from residual radioactive material to the atmosphere will not:</p> <p>(1) Exceed an average release rate of 20 picocuries per square meter per second. This average shall apply over the entire surface of the disposal site and over at least a 1-year period. Radon will come from both residual radioactive materials and from materials covering them. Radon emissions from the covering materials should be estimated as part of developing a remedial action plan for each site. The standard, however, applies only to emissions from residual radioactive materials to the atmosphere. Or,</p> <p>(2) Increase the annual average concentration of <sup>222</sup>Rn in air at or above any location outside the disposal site by more than 0.5 pCi/L.</p>	<p>Inactive uranium processing sites (radioactivity above 5 pCi/g)</p>	<p>40 CFR 192.02(a),(b)</p>	<p>Not an ARAR</p>	<p>Not applicable since Parcel C was not a uranium processing site. Potentially relevant and appropriate for sites where there is a potential for residual radium, uranium or thorium to release <sup>220</sup>Rn or <sup>222</sup>Rn. Following remedial action, there is a potential for residual radium at concentrations exceeding background, but not at the levels to meet the requirement.</p>

**Notes:**

<sup>a</sup> Many potential action-specific ARARs contain chemical-specific limitations and are addressed in the action-specific ARAR tables.

**TABLE C.2-1****POTENTIAL FEDERAL CHEMICAL-SPECIFIC ARARs  
FOR HUNTERS POINT SHIPYARD PARCEL C**

- <sup>b</sup> Statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the DON accepts the statutes or policies in their entirety as potential ARARs. Specific potential ARARs are addressed in the table below each general heading; only pertinent substantive requirements of the specific citations are considered potential ARARs.
- <sup>c</sup> U.S. EPA does not believe this NRC regulation is protective of human health and the environment, and the HPS cleanup goals are more protective. This regulation is an ARAR only for radiologically-impacted sites that are undergoing TCRA's and any additional remedial action required for those sites. It is not an ARAR for radiologically-impacted sites, buildings, or structures that will be transferred with engineering and institutional controls for radiological contaminants.

**Abbreviations and Acronyms:**

§	– section	NESHAPS	– National Emissions Standards for Hazardous Air Pollutants
ALARA	– as low as reasonable achievable	NRC	– Nuclear Regulatory Commission
ARAR	– applicable or relevant and appropriate requirement	PCB	– polychlorinated biphenyl
CAA	– Clean Air Act	pCi/g	– picocurie per gram
CCR	– California Code of Regulations	pCi/L	– picocurie per liter
CFR	– Code of Federal Regulations	ppm	– part per million
ch	– chapter	RCRA	– Resource Conservation and Recovery Act
cm	– centimeter	TCLP	– Toxicity Characteristic Leaching Procedure
DON	– Department of the Navy	TEDE	– total effective dose equivalent
FS	– Feasibility Study	tit.	– title
LLRW	– low-level radioactive waste	UMTRCA	– Uranium Mill Tailings Radiation Control Act
mrem/y	– millirem per year	U.S.C.	– United States Code
NAAQS	– National Ambient Air Quality Standards	WL	– working level

TABLE C.2-2

**POTENTIAL STATE CHEMICAL-SPECIFIC ARARs  
FOR HUNTERS POINT SHIPYARD PARCEL C**

Requirement	Prerequisite	Citation <sup>a</sup>	ARAR Determination	Comments
<b>State Water Resources Control Board and Regional Water Quality Control Boards<sup>b</sup></b>				
Requires the operator of a landfill to ensure that the concentration of methane gas migrating from a landfill does not exceed 5 percent by volume in air at the facility property boundary and that the concentration of methane gas does not exceed 1.25 percent by volume in air in any on-site structures during closure and post-closure of the landfill.	Landfill	CCR tit. 27, § 20921(a)(1) and (2)	Not an ARAR	There is no landfill at Parcel C.
The average concentration of beta particle activity and photon radioactivity from man-made radionuclides in drinking water shall not produce an annual dose equivalent to the total body or any internal organ greater than 4 millirem/y.	Not applicable	22 CCR Section 64443(a)	Not an ARAR	Not more stringent than federal MCLs at 40 CFR 141.66.
Compliance with this requirement is assumed if the average concentration of gross beta particle activity is less than 50 pCi/L and if the average concentration of tritium and strontium-90 are less than those listed on Table 4 of 22 CCR Section 64443(b).	Not applicable	22 CCR Section 64443(b)	Not an ARAR	Not more stringent than federal MCLs at 40 CFR 141.66.
<p>If the gross beta particle activity exceeds 50 pCi/L, an analysis of the sample shall be performed to identify the major radioactive constituent present and the appropriate organ and total body doses shall be calculated.</p> <p>Radionuclide concentrations for waters designated as domestic or municipal supply.</p> <ul style="list-style-type: none"> <li>• Combined radium-226 and -228 – 5 pCi/L</li> <li>• Gross alpha particle activity (including radium-226, but excluding radon and uranium) – 15 pCi/L</li> <li>• Tritium – 20,000 pCi/L</li> </ul>	Not applicable	22 CCR Section 64443(c)	Not an ARAR	Not more stringent than federal MCLs at 40 CFR 41.66.

TABLE C.2-2

**POTENTIAL STATE CHEMICAL-SPECIFIC ARARs  
FOR HUNTERS POINT SHIPYARD PARCEL C**

Requirement	Prerequisite	Citation <sup>a</sup>	ARAR Determination	Comments
<ul style="list-style-type: none"> <li>• Strontium-90 – 8 pCi/L</li> <li>• Gross beta particle activity – 50 pCi/L</li> <li>• Uranium – 20 pCi/L</li> </ul>				
<b>Cal/EPA Department of Toxic Substances Control</b>				
Defines “non-RCRA hazardous waste”	Waste	CCR tit. 22 § 66261.22(a)(3) and (4), § 66261.24(a)(2)-(a)(8), § 66261.101, § 66261.3(a)(2)(C), and § 66261.3(a)(2)(F)	Applicable	Applicable for determining whether a waste is or is not RCRA-hazardous waste. These requirements are already identified in the Revised FS for Report Parcel C (SulTech, 2007).
Establishes concentration limits for cleanup actions, including groundwater, surface water, and the unsaturated zones for other than hazardous waste at background. Allows a higher cleanup limit (but not to exceed MCLs) if background is not technically or economically achievable.		CCR tit.27 §§ 20380(a); 20400 (a), (d), (e), and (g) ; and 20405	Not an ARAR	Not more stringent than federal regulations at CCR tit. 22 § 66264.94.
Establishes concentration limits for cleanup action, including groundwater, surface water, and the unsaturated zones for other than hazardous waste at background. Allows a higher cleanup limit (but not to exceed MCLs) if background is not technically or economically achievable.		CCR tit.27 § 120400	Not an ARAR	Not more stringent than federal regulations at CCR tit. 22 § 66264.94.
Definitions of designated waste, nonhazardous waste, and inert waste.		CCR tit. 27 §§ 20210, 20220, and 20230	Applicable	Potential ARARs for classifying waste and determining ARAR status of other requirements. These requirements are already identified

TABLE C.2-2

**POTENTIAL STATE CHEMICAL-SPECIFIC ARARs  
FOR HUNTERS POINT SHIPYARD PARCEL C**

Requirement	Prerequisite	Citation <sup>a</sup>	ARAR Determination	Comments
				in the Revised FS Report for Parcel C (SulTech, 2007).
<b>California Department of Health Services<sup>b</sup></b>				
Standards for protection from radiation. This regulation incorporates 10 CFR §§ 20.1001 – 20.2402 and Appendices A – G by reference.		CCR tit 17 § 30253	Not an ARAR	These state regulations incorporate portions of the federal ARARs and are not more stringent than the federal ARARs.

**Notes:**

<sup>a</sup> Many potential action-specific ARARs contain chemical-specific limitations and are addressed in the action-specific ARAR tables.

<sup>b</sup> Statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the DON accepts the statutes or policies in their entirety as potential ARARs. Specific potential ARARs are addressed in the table below each general heading; only pertinent substantive requirements of the specific citations are considered potential ARARs.

**Abbreviations and Acronyms:**

§ – section  
 ARAR – applicable or relevant and appropriate requirement  
 Cal/EPA – California Environmental Protection Agency  
 CCR – California Code of Regulations  
 CFR – Code of Federal Regulations  
 DON – Department of the Navy  
 MCL – Maximum Contaminant Level  
 pCi/L – picocurie per liter  
 RCRA – Resource Conservation and Recovery Act  
 tit. – title

**TABLE C.3-1  
POTENTIAL FEDERAL AND STATE LOCATION-SPECIFIC ARARs  
FOR HUNTERS POINT SHIPYARD PARCEL C**

Requirement	Pre-requisite	Citation <sup>a</sup>	ARAR Determination	Comments
<b>National Historic Preservation Act of 1966, as Amended (Title 16 U.S.C., Sections 470-470x-6)<sup>b</sup></b>				
Action to preserve historic properties; planning of action to minimize harm to properties listed on or eligible for listing on the national Register of Historic Places.	Properties included in or eligible for the national Register of Historic Places	16 U.S.C., Sections 470-470x-6, 36 CFR 800, and 40 CFR 6.301(b)	Applicable	The DON has determined that Buildings 205 and 253 may be eligible for inclusion on the National Register of Historic Places. The DON is in compliance with this ARAR because none of the remedial alternatives evaluated in this Revised Feasibility Study Addendum include activities that will have a significant impact on the building structure.
<b>CZMA (Title 16 U.S.C., Sections 1451-1464)<sup>b</sup></b>				
Within coastal zone.	Activities conducted in a manner consistent with approved state management programs	16 U.S.C., Section 1456(c) and 15 CFR 930	Relevant and Appropriate	The CZMA excludes federal lands from the coastal zone; however, since portions of Parcel C are within the coastal zone, the DON has determined that it is relevant and appropriate.
<b>State Location-Specific Applicable or Relevant and Appropriate Requirements</b>				
<b>McAteer-Petris Act (California Government Code §§ 66600 through 66661) <sup>b</sup></b>				
Reduce fill and disposal of dredged material in San Francisco Bay, maintain marshes and mudflats to the fullest extent possible to conserve wildlife, abate pollution, and protect the beneficial uses of the Bay.	Activities affecting San Francisco Bay and 100 feet landward of the shoreline	San Francisco Bay Plan at CCR title 14 §§ 10110 through 11990	Relevant and Appropriate	The San Francisco Bay Plan is an approved state coastal zone management program, and the DON will continue to conduct its response actions in accordance with the goals of the San Francisco Bay Plan.
Reduce fill and disposal of dredged material in San Francisco Bay.	Activities affecting San Francisco Bay and 100 feet landward of the shoreline	California Government Code §§ 66600 – 66661.	Relevant and Appropriate	The San Francisco Bay Plan is an approved state coastal zone management program, and the DON will continue to conduct its response actions in accordance with the

**TABLE C.3-1  
POTENTIAL FEDERAL AND STATE LOCATION-SPECIFIC ARARs  
FOR HUNTERS POINT SHIPYARD PARCEL C**

Requirement	Pre-requisite	Citation <sup>a</sup>	ARAR Determination	Comments
				goals of the San Francisco Bay Plan.

**Notes:**

- <sup>a</sup> Only the substantive provisions of the requirements cited in this table are potential ARARs.
- <sup>b</sup> Statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the DON accepts the statutes or policies in their entirety as potential ARARs. Specific potential ARARs are addressed in the table below each general heading; only pertinent substantive requirements of the specific citations are considered potential ARARs.

**Abbreviations and Acronyms:**

- § – section
- ARAR – applicable or relevant and appropriate requirement
- CCR – California Code of Regulations
- CFR – Code of Federal Regulations
- CZMA – Coastal Zone Management Act
- DON – Department of the Navy
- U.S.C. – United States Code

**TABLE C.4-1**

**POTENTIAL FEDERAL AND STATE ACTION-SPECIFIC ARARs  
FOR HUNTERS POINT SHIPYARD PARCEL C**

<p>The alternatives for this feasibility study are: S-1–No Action; S-2–Institutional Controls and Maintained Landscaping; S-3–Excavation, Disposal, Maintained Landscaping, and Institutional Controls; S-4–Covers and Institutional Controls; S-5–Excavation, Disposal, Covers, Soil Vapor Extraction, and Institutional Controls; R-1–No Action; R-2–Survey, Decontamination, Disposal, Release, and Institutional Controls; and R-3–Survey, Decontamination, Disposal, Release, Close In-Place, and Institutional Controls.</p>							
Action	Requirement	Prerequisite	Citation	ARAR Determination			Comments
				A	RA	TBC	
<b>Resource Conservation and Recovery Act (42 U.S.C. §§ 6901–6991[i])*</b>							
On-site waste generation	Person who generates waste shall determine if that waste is a hazardous waste.	Generator of waste.	CCR tit. 22, § 66262.10(a), 66262.11				Not an ARAR since Parcel C radiological waste has been determined not to be RCRA hazardous waste.
	Requirements for analyzing on-site waste for determining whether waste is hazardous.	Generator of waste	CCR tit. 22 § 66264.13(a) and (b)				Not an ARAR since Parcel C radiological waste has been determined not to be RCRA hazardous waste.
Hazardous waste accumulation	On-site hazardous waste accumulation is allowed for up to 90 days as long as the waste is stored in containers in accordance with § 66262.171-178 or in tanks, on drip pads, inside buildings, and is labeled and dated, etc.	Accumulation of hazardous waste	CCR tit. 22 § 66262.34				Not an ARAR since Parcel C radiological waste has been determined not to be RCRA hazardous waste.
Site closure	Minimize the need for further maintenance controls and minimize or eliminate, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated rainfall or runoff, or waste decomposition products to groundwater or surface water or to the atmosphere.	Hazardous waste management facility	CCR tit. 22 § 66264.111(a) and (b)				Not an ARAR since Parcel C radiological waste has been determined not to be RCRA hazardous waste.

**TABLE C.4-1**

**POTENTIAL FEDERAL AND STATE ACTION-SPECIFIC ARARs  
FOR HUNTERS POINT SHIPYARD PARCEL C**

The alternatives for this feasibility study are: S-1–No Action; S-2–Institutional Controls and Maintained Landscaping; S-3–Excavation, Disposal, Maintained Landscaping, and Institutional Controls; S-4–Covers and Institutional Controls; S-5–Excavation, Disposal, Covers, Soil Vapor Extraction, and Institutional Controls; R-1–No Action; R-2–Survey, Decontamination, Disposal, Release, and Institutional Controls; and R-3–Survey, Decontamination, Disposal, Release, Close In-Place, and Institutional Controls.

Action	Requirement	Prerequisite	Citation	ARAR Determination			Comments
				A	RA	TBC	
Container storage	Storage containers of RCRA hazardous waste must be maintained in good condition, compatible with hazardous waste to be stored, and closed during storage except to add or remove waste.	Storage of RCRA hazardous waste not meeting small-quantity generator criteria before treatment, disposal, or storage elsewhere, in a container	CCR tit. 22 § 66264.171, 172, and 173				Not an ARAR since Parcel C radiological waste has been determined not to be RCRA hazardous waste.
	Inspect storage container storage areas weekly for deterioration.		CCR tit. 22 § 66264.174				Not an ARAR since Parcel C radiological waste has been determined to not be RCRA hazardous waste.
	Place storage containers on a sloped, free base, and protect from contact with accumulated liquid. Provide containment system with a capacity of 10 percent of the volume of containers of free liquids. Remove spilled or leaked waste in a timely manner to prevent overflow of the containment system.		CCR tit. 22 § 66264.175(a) and (b)				Not an ARAR since Parcel C radiological waste has been determined to not be RCRA hazardous waste.
	At closure, remove all hazardous waste and residues from the containment system, and decontaminate or remove all containers and liners.		CCR tit. 22 § 66264.178				Not an ARAR since Parcel C radiological waste has been determined to not be RCRA hazardous waste.

**TABLE C.4-1**

**POTENTIAL FEDERAL AND STATE ACTION-SPECIFIC ARARs  
FOR HUNTERS POINT SHIPYARD PARCEL C**

<p>The alternatives for this feasibility study are: S-1–No Action; S-2–Institutional Controls and Maintained Landscaping; S-3–Excavation, Disposal, Maintained Landscaping, and Institutional Controls; S-4–Covers and Institutional Controls; S-5–Excavation, Disposal, Covers, Soil Vapor Extraction, and Institutional Controls; R-1–No Action; R-2–Survey, Decontamination, Disposal, Release, and Institutional Controls; and R-3–Survey, Decontamination, Disposal, Release, Close In-Place, and Institutional Controls.</p>							
Action	Requirement	Prerequisite	Citation	ARAR Determination			Comments
				A	RA	TBC	
Waste pile	Allows generator to accumulate solid remediation waste in an EPA-designated pile for storage only, up to 2 years, during remedial operations without triggering land disposal restrictions.	Hazardous remediation waste temporarily stored in piles	40 CFR 264.554(d)(1) (i-ii) and (d)(2), (e), (f), (h), (i), (j), and (k)				Not an ARAR since Parcel C radiological waste has been determined to not be RCRA hazardous waste.

**Notes:**

- § – section
- A – applicable
- ARAR – applicable or relevant and appropriate requirement
- CCR – California Code of Regulations
- CFR – Code of Federal Regulations
- EPA – U.S. Environmental Protection Agency
- RA – relevant and appropriate
- RCRA – Resource Conservation and Recovery Act
- TBC – to be considered
- tit. – title
- U.S.C. – United States Code

**APPENDIX D  
RESPONSE TO COMMENTS FOR THE  
DRAFT FINAL RADIOLOGICAL ADDENDUM TO THE REVISED  
FEASIBILITY STUDY REPORT FOR PARCEL C**

**RESPONSE TO COMMENTS FOR THE  
DRAFT FINAL RADIOLOGICAL ADDENDUM TO THE REVISED  
FEASIBILITY STUDY REPORT FOR PARCEL C  
DATED MARCH 11, 2008  
DCN: ECSD-2201-0006-0077**

Reviewed by the Environmental Protection Agency  
Comments Dated: April 8, 2008

<b>GENERAL COMMENTS</b>	<b>RESPONSE</b>
<p>The NRC dose limit of 25 millirem/year should not be used or referenced as the final cleanup goal. While any rad cleanup does have to meet this limit as a minimum, EPA requires that all cleanup goals be based on risk. The document generally discusses 25 millirem/year as being within the risk range. However, EPA guidance states that 25 millirem/year equates to a risk of <math>5 \times 10^{-4}</math>, which is outside the risk range.</p>	<p><b>Response 1.</b> Comment noted. The Navy agrees that remediation goals (RGs) shall be protective of human health and the environment, as defined by estimates of residual risk. Additionally, applicable and/or relevant and appropriate requirements (ARARs) are often the determining factor in establishing cleanup levels at CERCLA sites. However, where ARARs are not available or are not sufficiently protective, site-specific remediation goals are generally set for carcinogens (radionuclides) at a level that represents an excess upper bound lifetime cancer risk to an individual of between <math>10^{-4}</math> and <math>10^{-6}</math>. The residual risk of the remedial action will be consistent with acceptable risk levels set forth in U.S. EPA's 22 August 1997 Office of Solid Waste and Emergency Response (OSWER) Directive "Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination" (OSWER No. 9200.4 18), as amended by U.S. EPA's 12 December 1999 OSWER "Radiation Risk Assessment At CERCLA Sites: Q&amp;A" in which EPA clarifies that the 15 millirem/year (mrem/y) dose limit shall not be used as a presumptive cleanup goal under CERCLA. Further, dose recommendations (e.g., guidance such as DOE Orders and NRC</p>

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Reviewed by the Environmental Protection Agency  
Comments Dated: April 8, 2008

Regulatory Guides) should generally not be used as to-be-considered material (TBCs).

For the remedial actions to be conducted to address the risk posed by radiological contamination at the Parcel C radiologically impacted buildings, the Navy has elected to identify NRC ARAR “Radiological Criteria for Unrestricted Use at Closing NRC Licensed Facilities” at 10 C.F.R. § 20.1402 (25 mrem/y and “as low as reasonably achievable”) as relevant and appropriate for “free-release” surveys.

The RGs presented in Table 3-2 for “Surfaces” were derived from Atomic Energy Commission Regulatory Guide 1.86 (1974) or 25 mrem/y, as calculated with RESRAD-Build Version 3.3, whichever is lower. The selected RGs generally result in a residual dose below 15 mrem/y, excluding Pu-239 and Th-232. The dose associated with the Pu-239 and Th-232 release criteria is 18.1 and 24.9 mrem/y, respectively.

Although both 15 and 25 mrem/y are equivalent to risk greater than  $1E-4$ , site-specific information, risk analysis, and the identification of radionuclides of concern at each building indicates that the residual incremental radiological risk at each building in Parcel C is at or below the  $10^{-6}$  level, which is conservatively protective. The cumulative risk under the future

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use scenarios at Parcel C is presented in Table 3-5, and is consistently within the  $10^{-5}$  to  $10^{-3}$  range. The majority of the risk can be attributed to residual chemical contamination, to be addressed as part of the remedy selection process for Parcel C. The remedy selected for Parcel C will be protective of human health and the environment and comply with ARARs.

It is important to note that the estimates of residual risk included in the radiological addendum assume that the radionuclides of concern (ROCs) are present at the release criteria (RGs) following remediation. During actual free-release surveys, if the ROCs are detected at the release criteria, additional characterization and remediation is conducted. Consequently, the dose and/or risk calculated post-remediation and included in free-release documentation, will be lower than the estimates in the radiological addendum.

The following text has been added as a footnote to Tables 4-1 and C.2-1 of the Final Parcel C FS RA main text and Appendix C, respectively: *“U.S. EPA does not believe this NRC regulation is protective of human health and the environment, and the HPS cleanup goals are more protective. This regulation is an ARAR only for radiologically-impacted sites that are undergoing TCRA’s and any additional remedial action required for those sites. It is not an ARAR for radiologically-impacted sites, buildings, or structures that will be transferred with engineering and institutional controls for radiological contaminants.”*

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Reviewed by the Environmental Protection Agency  
Comments Dated: April 8, 2008

SPECIFIC COMMENTS	RESPONSE
<b>Comment 1. Section 3.3, Remediation Goals:</b> This is a specific case of the improper use of 25 millirem/year as a cleanup goal.	<b>Response 1.</b> Comment noted, please see response to EPA General Comment 1.
<b>Comment 2. Section 3.5, Analysis of Radiological Dose and Risk:</b> The second paragraph states that the dose model for Bldgs. 211, 241 and 253 were above 25 millirem/year, yet the referenced Table 3-3 shows much lower values.	<b>Response 2.</b> The reference statement is an oversight. The text has been revised to state that the doses modeled for these building is below 25 mrem/y.
<b>Comment 3. Appendix A Table A5.1:</b> How were the risks calculated from the doses? Also, how does a building with a higher dose, like 241, have a lower risk than other buildings?	<b>Response 3.</b> Risks were calculated using RESRAD-BUILD. The risk in RESRAD-BUILD is calculated by using isotope-specific dose conversion/slope factors. Since these dose conversion/slope factors are different for each isotope, the relationship between total dose and risk is not linear, and it is possible to have equivalent dose measurements for different combinations of isotopes that have non-equivalent residual risk calculations.

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Reviewed by the Department of Substances Control  
Thomas P. Lanphar, Senior Hazardous Substances Scientist  
Office Military Facilities, Department of Toxic Substances Control  
Comments Dated: April 11, 2008

<b>GENERAL COMMENTS</b>	<b>RESPONSE</b>
<p><b>Comment 1.</b> EMB understands the Navy's concern regarding health and safety issues with radiological surveys to be performed in the shaft 10 feet below the ground surface in Building 205 but would like to have some kind of reasonable estimate for the radiological contamination that is being left behind in the building. As it may not be possible to perform complete "MARSSIM like" survey of the shaft 10 feet below the ground surface, EMS suggests using something similar to "hook-on grab bucket" for collecting samples from the bottom of the shaft to get some idea regarding the contamination that is being left behind. Hook-on-grab buckets are generally used for removing material being excavated, such as gravel, sand or other soil, from a relatively great depth of up to 100 meters or more, for example for obtaining gravel from excavation ponds. Additionally, any gamma surveys that can be done using equipment similarly used in bore-hole surveys would be helpful.</p>	<p><b>Response 1.</b> Comment noted. The Navy appreciates the suggestions and intends to evaluate multiple sampling techniques and rationales, in consultation with the regulatory stakeholders, when designing the survey approach for Building 205.</p>