SAFETY AND MISSION ASSURANCE DIRECTORATE

Plum Brook Reactor Facility

FINAL STATUS SURVEY PLAN FOR THE PLUM BROOK REACTOR FACILITY

Revision 0
December 3, 2004

Form
AD-01/ 7
Rev 2

SAFETY AND MISSION ASSURANCE DIRECTORATE

FINAL STATUS SURVEY PLAN FOR THE PLUM BROOK REACTOR FACILITY

APPROVALS:

James E Crocker 12/3/04

Name: James Crocker Date
Project Manager, Montgomery Watson Harza

Sheryl Leeper 12/3/04

Name: Sheryl Leeper Date
Resident Engineer, U. S. Army Corps of Engineers

Timothy J Polich 12-15-04

Name: Timothy J Polich Date
NASA Decommissioning Project Manager

NASA PBRF DECOMMISSIONING PROJECT CHANGE/CANCELLATION RECORD		
DOCUMENT TITLE: **Final Status Survey Plan for the Plum Brook Reactor Facility**	**DOCUMENT NO:**	**REVISION NO: 0**
Revision 0: Initial issue of Procedure		

Form
AD-01/ 3
Rev 1

LIST OF EFFECTIVE PAGES

Title: Final Status Survey Plan for the PBRF **REVISION NO: 0**

Page No.	Revision Level	Page No.	Revision Level	Page No.	Revision Level
Cover Page	0	Att A Add 1 Cover	0	Att B Add 4 Cover 26 Pages	0
Signature Page	0	A1-1 thru A1-15	0	Att C Cover	0
Change Record	0	Att A Add 2 Cover	0	Att C Add 2 Cover	0
LOEP	0	A2-1 thru A2-16	0	C2-1 thru C2-2	0
i thru v	0	Att A Add 3 Cover 266 Pages	0	Att C Add 3 Cover	0
1-1 thru 1-8	0	Att A Add 4 Cover	0	C3-1 thru C3-9	0
2-1 thru 2-23	0	A4-1 thru A4-2	0	Att C Add 4 Cover 97 Pages	0
3-1 thru 3-10	0	Att A Add 5 Cover 33 Pages	0	Att C Add 5 Cover 7 Pages	0
4-1	0	A6-1 thru A6-9	0	Att D Cover	0
5-1 thru 5-13	0	Att A Add 7 Cover 158 Pages	0	D-1 thru D-33	0
6-1 thru 6-12	0	Att B Cover	0		
7-1 thru 7-5	0	B-1 thru B-26	0		
8-1 thru 8-3	0	Att B Add 1 Cover 55 Pages	0		
9-1 thru 9-5	0	Att B Add 2 Cover 57 Pages	0		
10-1 thru 10-2	0	Att B Add 3 Cover 63 Pages	0		
11-1 thru 11-13	0	C-1 thru C-8	0		
12-1 thru 12-2	0	Att C Add 1 Cover	0		
Att. A Cover	0	C1-1 thru C1-9	0		
A-1 thru A-33	0				

Form AD-01/ 5 Rev 1

TABLE OF CONTENTS

TABLE OF CONTENTS (cont)

TABLE OF CONTENTS (cont)

LIST OF TABLES

TABLE OF CONTENTS (cont)

LIST OF FIGURES

LIST OF ATTACHMENTS

LIST OF ACRONYMS

α	Alpha
AF	Area Factors
ALARA	As Low As Reasonable Achievable
ANL	Argonne National Laboratory
β	Beta
BOP	Balance of Plant
CFR	Code of Federal Regulations
CoC	Chain-of-Custody
cm	Centimeters
cm^2	Square Centimeters
cpm	Counts per Minute
CR	Condition Report
CV	Coefficient of Variation
DCGL	Derived Concentration Guideline Levels
EBS	Environmental Baseline Survey Report
EMC	Elevated Measurement Comparison
EP	Embedded Pipe
EPA	Environmental Protection Agency
ERB	Emergency Retention Basin

LIST OF ACRONYMS (Continued)

FSS	Final Status Survey
FSSP	Final Status Survey Plan
FSSR	Final Status Survey Report
ft	Feet
gal	Gallons
γ	Gamma
GPS	Global Positioning System
GRC	Glenn Research Center
HSA	Historical Site Assessment
HTD	Hard To Detect
km	Kilometers
LBGR	Lower Boundary of the Gray Region
LC	Location Code
m	Meters
m^2	Square Meters
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MDC	Minimum Detectable Concentration
mi	Miles
mrem	Millirem
MUR	Mock Up Reactor
NASA	National Aeronautics and Space Administration
NRC	Nuclear Regulatory Commission
ODNR	Ohio Department of Natural Resources
OEPA	State of Ohio Environmental Protection Agency
NIST	National Institute of Standards and Technology
PBRF	Plum Brook Reactor Facility
PBS	Plum Brook Station
pCi/g	Picocuries per Gram
PM	Project Manager
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
ROLB	Reactor Office and Laboratory Building
RPD	Relative Percent Difference
RSD	Relative Standard Deviation
SEB	Reactor Service Equipment Building
SDMS	Survey Data Management System
SME	Subject Matter Expert
SPF	Space Power Facility
TBD	Technical Basis Document
TERC	Total Environmental Restoration Contract
TSC	Total Surface Contamination
μR/hr	MicroRoentgen per Hour
USACE	US Army Corps of Engineers
WEMS	Water Effluent Monitoring Station
WRS	Wilcoxon Rank Sum Test

1.0 INTRODUCTION

1.1 Purpose

This Final Status Survey Plan (FSSP) provides the approach and methods for demonstrating compliance with U.S. Nuclear Regulatory Commission (NRC) regulation in 10 CFR 50.82(b)(4)(iii) and the unrestricted use criteria in 10 CFR 20 Subpart E (25 mrem/yr plus ALARA). The requisite ALARA analysis methodology is described in the "Decommissioning Plan for the Plum Brook Reactor Facility" (Decommissioning Plan), section 2.2.3.2. The Final Status Survey Report (FSSR) submitted in accordance with this FSSP will seek to demonstrate that the facility and site are suitable for release in accordance with 10 CFR 50.82(b)(6)(ii) and allow the termination of licenses TR-3 and R-93.

The FSSP is based on guidance provided in NUREG-1575, "Multi-Agency Radiation Survey and Site Investigation Manual" (MARSSIM); NUREG 1757, "Consolidated NMSS Decommissioning Guidance"; NUREG-1727, "NMSS Decommissioning Standard Review Plan"; and DG-4006, "Demonstrating Compliance with the Radiological Criteria for License Termination".

The graded approach described in NUREG-1575 (MARSSIM) is followed to ensure that survey efforts are maximized in those areas having the greatest potential for residual contamination. The FSSP was developed to work in conjunction with the programmatic plans that are currently in place to safely and effectively decontaminate and dismantle the Plum Brook Reactor Facility (PBRF) as described in the Decommissioning Plan.

Guidance contained in NUREG-1727, and NUREG-1757 was used as an information source during FSSP development. NUREG-1727 replaced DG-4006 and NUREG 1757 has replaced NUREG 1727 as the guidance for implementing requirements set forth in 10 CFR Part 20, Subpart E. NUREG 1727 and NUREG 1757 contain additional decommissioning guidance and information. However, the Final Status Survey Plan (FSSP) for the PBRF is based on DG-4006 as stated in the Decommissioning Plan.

1.2 Site Description

The FSS primarily includes remaining structures, surface soil, and embedded pipe (EP) that are identified as contaminated or potentially contaminated as a result of licensed activities. Other media to be surveyed include subsurface soil, buried pipe, asphalt, surface water and other foundation/concrete structures.

The PBRF is a complex of buildings that housed two nuclear reactors. The National Aeronautics and Space Administration (NASA) currently has two 10 CFR Part 50 facility licenses to "possess but not operate" two reactors within the Reactor Building (Building 1111).

NRC license TR-3 is for the 60-megawatt research test reactor and NRC license R-93 is for the 100-kilowatt swimming-pool type Mock Up Reactor (MUR). The reactors were used to perform irradiation testing of fueled and non-fueled

experiments for space nuclear program applications.

The PBRF complex of buildings is within a 27-acre fenced area in the northern portion of NASA's Plum Brook Station (PBS). The PBS is located about 6 kilometers (km) (4 miles (mi)) south of Sandusky, Ohio, about midway between Cleveland and Toledo, and just north of the Ohio Turnpike. Farmlands and low density housing surround the PBS. Approximately 5400 acres of the PBS are enclosed within a high security fence with 1000 acres outside the fence to act as a buffer zone. The topography in the area slopes gently northward toward Lake Erie. The Huron River and its branches constitute the major surface water system. Eleven streams cross PBS, the largest of which are Pipe Creek, Kuebler Ditch, Ransom Brook, and Plum Brook. Streams generally flow northward and converge into Ransom Brook, Storrs Ditch, Plum Brook, and Sawmill Creek and eventually flow north into Lake Erie approximately 6 km (4 mi) to the north. Seventeen isolated ponds and reservoirs are located on PBS. The average slope of the land is less than 6%. Elevation ranges from about 191 to 207 m (625 to 680 ft) above sea level. The elevation at the PBRF is about 191 m (625 ft) above sea level. The site layout is shown on Figures 1-1 and 1-2.

The PBRF complex includes the Reactor Building, a seven-cell Hot Laboratory complex (Building 1112) and several support facilities. These support facilities include the Reactor Office and Laboratory Building (Building 1141), the Primary Pump House (Building 1134), the Fan House (Building 1132), the Waste Handling Building (Building 1133), the Hot Retention Area (Building 1155), the Cold Retention Basins (Building 1154), the Hot Pipe Tunnel and other general support facilities such as the Reactor Services Equipment Building (Building 1131), Cryogenic and Gas Supply Farm and Building (Buildings 1195 and 9837), Compressor Building (Building 1136), and Gas Services Building (Building 1135). Areas of environmental contamination include earthen structures and soil that were contaminated as a result of past operations including the Emergency Retention Basin, a drainage system, the Reactor Water Effluent Monitoring Station (Building 1192), the Pentolite Ditch, and known past spill areas (see sections 2.3.1 and 2.3.2 for a description of spill areas).

The PBRF area is drained by Pentolite Ditch which has been extensively modified for drainage. The ditch is characterized by steep banks (2 to 1 slope) and vegetated with a mixture of grasses, herbaceous weeds, and shrubs. The channel is relatively straight because of past dredging activities. Surface water flow is intermittent in the summer and fall with small isolated pools. The only surface water discharge from the PBRF during decommissioning activities is surface runoff.

PBS is underlain by an overburden aquifer and two principal bedrock aquifers. A fractured limestone aquifer occurs in the western portion of Erie County, and groundwater flow in this aquifer is to the north. A fine-grained shale aquifer to the east of the limestone aquifer has low yields, and the Ohio Department of Natural Resources (ODNR) has delineated three groundwater zones based on well yield. The PBRF overlies the fractured limestone aquifer. Wells completed in the fractured limestone aquifer have yields ranging from 19 to 95

liters (5 to 25 gallons) per minute. The bedrock aquifers are overlain by unconsolidated deposits of glacial origin. These unconsolidated deposits comprise the overburden aquifer. The thickness of the overburden ranges from less than 1.5 m (5 ft) to greater than 8 m (25 ft). The overburden is the thickest in the vicinity of the PBRF where it is thought to fill in a depression in the underlying bedrock surface.

A site wide groundwater investigation at PBS is being conducted by the US Army Corps of Engineers (USACE) under the Defense Environmental Restoration Program formerly utilized sites. The PBRF area has been included in this investigation. A total of ten wells have been installed at the PBRF as part of this program since it was initiated in 1997. Four wells have been installed in the bedrock aquifer and the remaining six wells are installed in the overlying overburden aquifer. A second groundwater investigation is being conducted under the Resource Conservation and Recovery Act (RCRA) program in the PBRF area. The elevation of the groundwater surface is measured quarterly and the groundwater quality is measured semiannually as part of the site wide groundwater investigation.

Refer to the PBRF Decommissioning Plan for further operational history information.

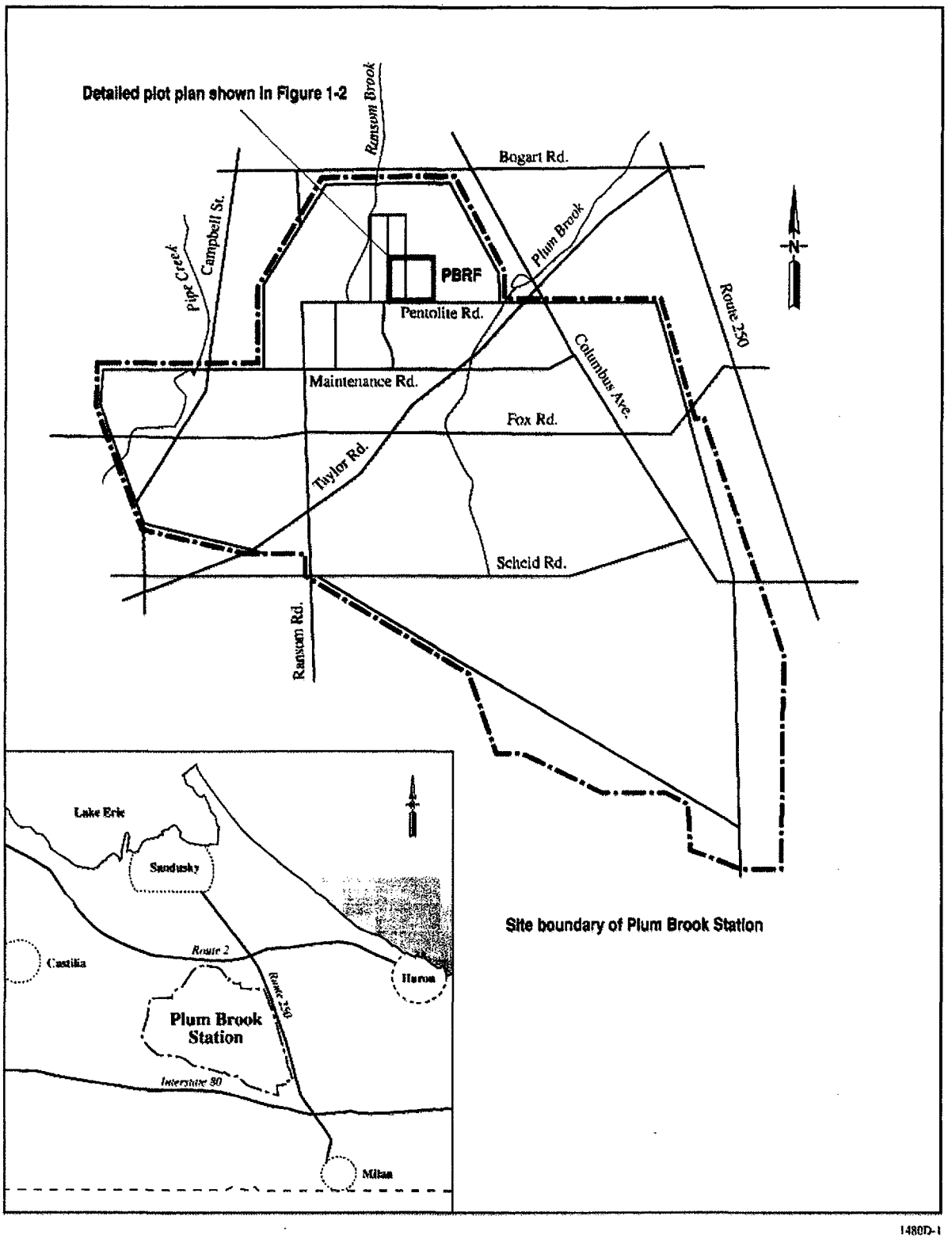


Figure 1-1. Location of the Plum Brook Reactor Facility at Plum Brook Station (Modified from NASA 1980a)

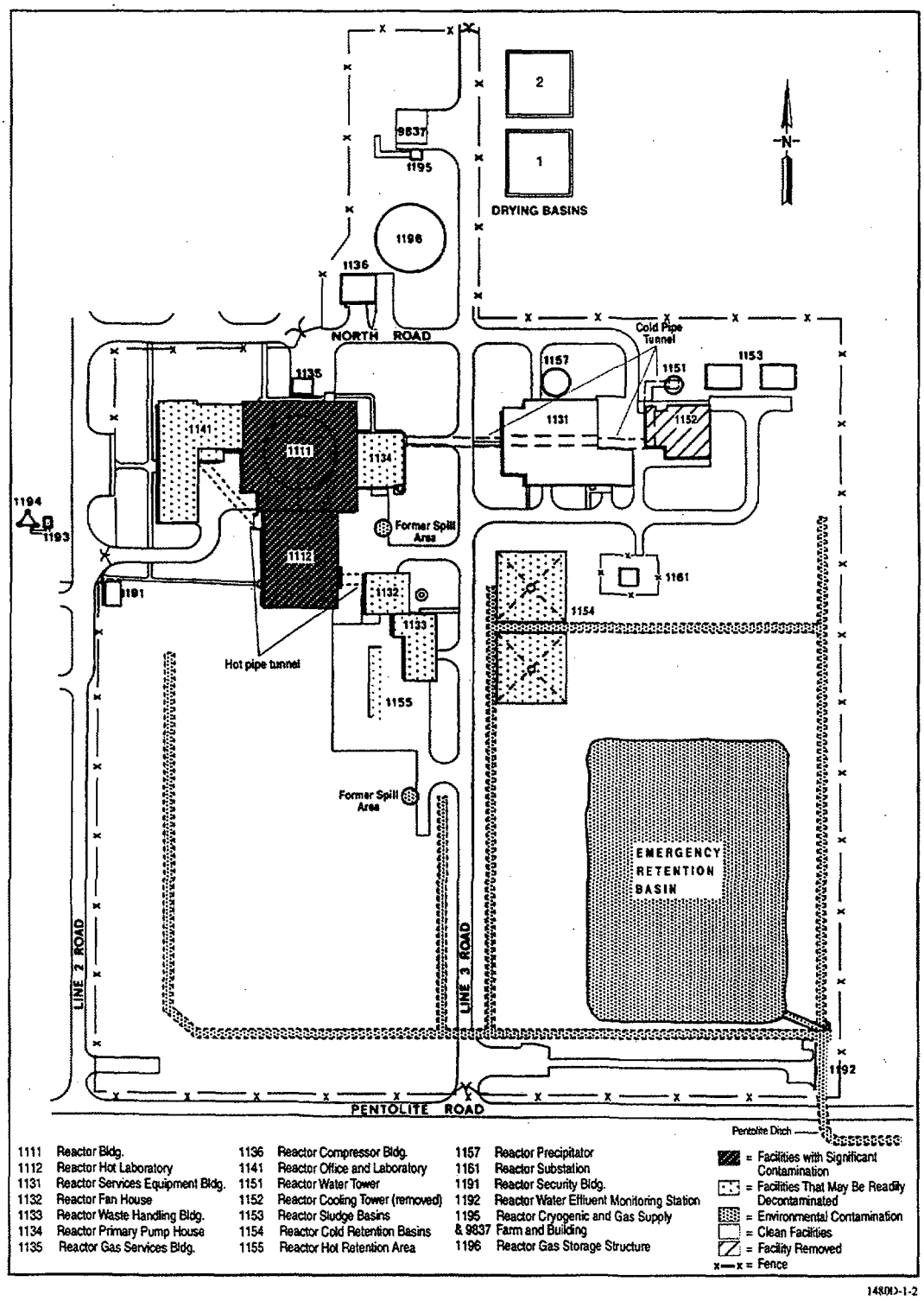


Figure 1-2. Plot Plan of Plum Brook Reactor Facility (Modified from NASA 1980b)

1.3 Decommissioning Process

As stated in the Decommissioning Plan, NASA has decided that the PBRF should be decontaminated, remaining radioactive structures and materials properly dispositioned, the 27-acre PBRF area released for unrestricted use and its NRC licenses terminated. The decommissioning activities will be conducted in accordance with the Decommissioning Plan requirements, facility licenses, and approved technical specifications.

NASA evaluated a range of alternatives for decommissioning the PBRF before selecting decontamination to allow release for unrestricted use according to 10 CFR 20.1402 criteria. The Decommissioning Plan Section 2.1, "Decommissioning Process", describes the project as being comprised of three major milestones: decontamination, FSS to provide documentation for license termination, and demolition of the remaining facilities. However, the Decommissioning Plan allows the flexibility necessary to alter the order in which these milestones are accomplished. An overview of the planned decommissioning process is described below.

- The first step will be to remove all potentially contaminated equipment and decontaminate the PBRF structures and remediate soils to residual contamination levels that are below the site-specific Derived Concentration Guideline Levels (DCGL). Equipment and systems to be removed include the reactor tank and its internals, the MUR, the material in the Hot Dry Storage area, and contaminated equipment and piping in PBRF buildings and structures. Concrete and other structural surfaces will be decontaminated by scabbling or other methods and contaminated soil in areas surrounding the PBRF will be excavated. Waste generated during decontamination will be properly disposed of offsite.
- After decontamination is complete in each designated FSS area, an FSS will be conducted to demonstrate that the residual contamination is below the site-specific DCGL. Documentation will be developed describing the survey methods and results obtained (see section 10.3). This documentation will be the basis of the report submitted to the NRC to demonstrate compliance with the unrestricted use criteria and to support license termination. Confirmatory surveys will be performed by regulatory agencies as appropriate.
- The final step will be to demolish decontaminated buildings and structures to 3 feet below grade. This will be performed after the PBRF licenses have been terminated. Below-grade foundations will be backfilled with demolition debris that satisfies the site-specific DCGLs and clean fill. Soil excavations will be backfilled and compacted with clean fill.

PBRF anticipates that both the NRC and the State of Ohio Environmental Protection Agency (OEPA) may choose to conduct confirmatory measurements in accordance with applicable laws and regulations. Timely and frequent communications with these agencies will ensure that they are afforded sufficient

opportunity to perform confirmatory measurements prior to PBRF implementing any irreversible decommissioning actions that have an impact on the FSS (e.g., building demolition, excavation backfill).

1.4 FSS Overview

There are 5 major steps in the final survey process: survey preparation, survey design, data collection, data assessment, and documentation of survey results.

1.4.1 Survey Preparation

Survey preparation is the first step in the final survey process and occurs after any required remediation or decontamination is completed. The area to be surveyed is isolated and/or controlled to ensure that radioactive material is not reintroduced into the area from ongoing demolition or remediation activities nearby and to maintain the final configuration of the area. An inspection of the area will be conducted by FSS personnel to ensure that all work is complete and that the area is ready for FSS. Control of activities is transferred from the area manager to the FSS/Characterization group. The isolation and control measures that will be employed until the area is released for unrestricted use are described in section 11.3. Materials not needed to support survey activities will be removed unless authorized by Project Management. Routine access, material storage and personnel transit through the area will be carefully controlled in accordance with project procedures.

In areas where remediation was required, a post-remediation radiological survey or "turnover" survey will be performed to confirm that remediation was successful prior to initiating final survey activities. A turnover survey may be performed using the same process and controls as a FSS so that data from a turnover survey may be used as part of the final survey data. In order for turnover survey data to be used for FSS, it must have been designed and collected in accordance with the requirements of sections 5.0 through 7.0 of this FSSP and the area controlled in accordance with section 11.3. Following the turnover survey, the FSS is performed.

1.4.2 Survey Design

The survey design process establishes the methods and performance criteria used to conduct the survey. Survey design assumptions are documented in "Survey Package Design Process" (see section 5.4.3).

The site land, structures, EP, and other media are organized into survey areas and classified by contamination potential as Class 1, Class 2 or Class 3 (see section 2.0) in accordance with the guidance provided in NUREG-1575 (MARSSIM).

Survey unit size is selected in accordance with Table 4-1. The percent coverage for scan surveys is determined (section 5.1). The number and location of structure surface measurements and soil samples are established (see sections 5.2 and 5.4). Investigation levels are also

established. (see section 7.1).

Replicate measurements are performed as part of the quality process established to identify, assess, and control errors and uncertainty associated with sampling, survey, or analytical activities. This quality control process, described in section 11.0, provides assurance that the survey data meets the precision and reliability requirements necessary to support the decision to release or not release a survey unit.

1.4.3 Survey Data Collection

After preparation of a survey package, the final survey data are collected. Trained and qualified personnel perform the necessary measurements using calibrated instruments in accordance with approved procedures and instructions contained in the survey package.

1.4.4 Survey Data Assessment

Survey data assessment is performed to verify that the data are sufficient to demonstrate that the survey unit meets the unrestricted use criterion (i.e., the Null Hypothesis may be rejected). Statistical analyses are performed on the data, if necessary, and the data are compared to investigation levels. Depending on the results of an investigation, the survey unit may require further remediation, reclassification, and/or resurvey. Graphical representations of the data, such as posting plots or histograms, may be generated to provide qualitative information from the survey or to support investigations. The assumptions and requirements in the survey package are reviewed. Additional data needs, if required, are identified during this review.

1.4.5 Survey Results

Survey results are documented by Survey Unit in "Survey Packages". The data is reviewed, analyzed, processed and the results summarized in a "Release Record". The Release Record provides the information necessary to support the decision to release the survey unit for unrestricted use.

A Final Status Survey Report (FSSR) is prepared that provides the necessary data and analyses from the Survey Packages and Release Records, and is submitted to the NRC to support license termination.

2.0 CLASSIFICATION OF AREAS

Area classification ensures that the number of measurements and the scan coverage are commensurate with the potential for residual contamination to exceed the unrestricted use criterion. Classifications include Class 1, Class 2, and Class 3 as described in section 2.2.

In the Decommissioning Plan, the facilities and grounds were divided into survey areas and assigned initial area classifications based on data from the 1985 and 1998 characterization surveys. Additional characterization performed after Decommissioning Plan approval has provided data to support a change, both increasing and decreasing, in a number of the initial classifications. The current classifications are provided in Tables 2-1 and 2-2.

Amendment No. 11 of License No. TR-3, Section 3, Part A.1.h, states that an area classification may not be decreased (i.e., impacted to non-impacted; Class 1 to Class 2; Class 2 to Class 3; or Class 1 to Class 3) without first seeking NRC approval. This FSSP is being submitted as a license amendment request. The proposed decreases in classifications provided in Tables 2-1 and 2-2 comply with License Condition A.1.h since NRC approval of this FSSP, including Table 2-1 and 2-2, is being requested.

2.1 Non-Impacted Areas

Non-Impacted areas have no reasonable potential for residual contamination because there was no known impact from site operations. These areas are not required to be surveyed beyond what has already been completed as a part of site characterization to confirm the area's non-impacted classification. As part of the initial area classifications presented in the Decommissioning Plan, several buildings and large components were classified as non-impacted. These structures were as follows:

- Reactor Service Equipment Building (1131)
- Reactor Gas Service Building (1135)
- Reactor Water Tower (1151)
- Reactor Substation (1161)
- Reactor Security Building (1191)
- Reactor Compressor Building (1136)
- Reactor Cryogenic and Gas Supply Farm and Building (1195 & 9837)
- Reactor Gas Storage Structure (1196)

Since the development and approval of the Decommissioning Plan, PBRF has determined that all structures within the licensed area that will be intact at the time of license termination will be classified at a minimum as a Class 3 structure and will be subjected to FSS. Subsequently, there are no non-impacted areas within the 27-acre fenced area that comprises the licensed PBRF complex.

Any structure demolished prior to license termination will be subjected to release surveys under the current PBRF Radiation Protection Program and appropriately disposed of offsite. Demolition debris released in this manner shall not be used as backfill.

In addition to the licensed area, PBRF is also assessing several areas outside of the licensed facility on the PBS site that may have been impacted by facility operations. These areas include the Pentolite Ditch and open land areas adjacent to the facility fence. Characterization surveys shall be performed in these areas to ascertain the presence and concentration of any licensed radioactive material. Areas outside the licensed area where licensed radioactive material is positively identified will be classified accordingly and added to the FSS scope.

2.2 Impacted Areas

Impacted areas may contain residual radioactivity from licensed activities. Based on the levels of residual radioactivity present, impacted areas are further divided into Class 1, Class 2, or Class 3 designations. All Class 1 open land areas will have a Class 2 or Class 3 buffer zone between the Class 1 area and any non-impacted area. This may result in additional impacted areas outside of the facility fence.

- Class 1 Areas - Areas that have, or had prior to remediation, a potential for radioactive contamination (based on site operating history) or known contamination (based on previous radiation surveys) above the $DCGL_W$.[1] Examples of Class 1 areas include: 1) site areas previously subjected to remedial actions, 2) locations where leaks or spills are known to have occurred, 3) former burial or disposal sites, 4) waste storage sites, and 5) areas with contaminants in discrete solid pieces of material and high specific activity.

- Class 2 Areas - Areas that have, or had prior to remediation, a potential for radioactive contamination or known contamination, but are not expected to exceed the $DCGL_W$. To justify changing the classification from Class 1 to Class 2, there should be measurement data that provides a high degree of confidence that no individual measurement would exceed the $DCGL_W$. Other justifications for reclassifying an area as Class 2 may be appropriate based on site-specific considerations. Examples of areas that might be classified as Class 2 for the final status survey include: 1) locations where radioactive materials were present in an unsealed form, 2) potentially contaminated transport routes, 3) areas downwind from stack release points, 4) upper walls and ceilings of buildings or rooms subjected to airborne radioactivity, 5) areas handling low concentrations of radioactive materials, and 6) areas on the perimeter of former contamination control areas.

- Class 3 Areas - Any impacted areas that are not expected to contain any residual

1 The "w" in $DCGL_w$ refers to the Wilcoxon Rank Sum test per MARSSIM (NUREG-1575, page 2-3) but generally represents the uniform level of residual contamination that results in the dose limit, regardless of the statistical test used.

radioactivity, or are expected to contain levels of residual radioactivity at a small fraction of the $DCGL_W$, based on site operating history and previous radiation surveys. Examples of areas that might be classified as Class 3 include buffer zones around Class 1 or Class 2 areas, and areas with very low potential for residual contamination but insufficient information to justify a non-impacted classification.

2.3 Previous and Continuing Characterization

The PBRF Decommissioning Plan describes the operational history of the PBRF and summarizes the radiological status of the PBRF. The Decommissioning Plan also discusses routine and non-routine events that occurred during the PBRF's operational history that contributed to facility radioactivity and contamination levels as well as presenting information from a characterization survey conducted in 1985 and a confirmatory survey conducted in 1998.

The "Final Environmental Baseline Survey Report for the Plum Brook Reactor facility Decommissioning Project, Tetra Tech, Inc. (EBS)", also summarized the results of the radiological surveys and hazardous material or non-radiological contaminant surveys conducted at the PBRF. Major historical facts, as stated in the Decommissioning Plan, relevant to decommissioning were:

- there is no fuel in the reactors,
- there was the possibility of a few small suspected fuel cladding leaks during reactor operations, and
- the PBRF previously underwent a program of waste removal and decontamination following shutdown.

2.3.1 Previous Characterization Efforts

A radiological survey of the PBRF was conducted in 1985 and a confirmatory survey was conducted in September 1998. The major conclusions from the 1985 characterization survey were as follows:

- The majority of the radionuclide inventory at the PBRF was in two locations: (1) the reactor tank and its internals and (2) in stored waste in the Hot Dry Storage Area of the Hot Laboratory.
- Most of the contamination inside the buildings resided in piping and equipment internals. Other than the internal piping and equipment contamination, residual contamination in the facilities was limited to locations where piping or equipment has leaked (e.g. the Hot Pipe Tunnel and evaporator in the Waste Handling Building).
- In the reactor tank (exclusive of reactor internals) and the primary cooling system, Co-60 was the dominant gamma-emitting nuclide based on analysis of material samples.
- The isotope Co-60 and fission products Cs-137 and Sr-90 were detected in the canal and quadrant drains, hot sumps, resin pits, Hot

Retention Area, and Cold Retention Basins.

- Co-60 and fission products were detected in areas of suspect environmental contamination.
- Residual radiation levels in the MUR ranged from 1.5 mrem/hr to 13 mrem/hr with no significant alpha activity.

The 1998 confirmatory radiological survey (presented in the Decommissioning Plan, Appendix A) was only conducted in portions of the PBRF to support the planning for decommissioning and license termination activities. The results from the 1998 confirmatory survey generally confirmed the findings from the 1985 survey for the areas surveyed. However, the 1998 survey identified six additional contaminated areas as follows:

- Four laboratories (Rooms 207, 209, 210 and 213A) in the Reactor Office and Laboratory Building;
- An area of contamination on the - 4.6 m (-15 ft) basement level of the Reactor Building; and
- Contamination on the pavement near the west entrance to the Reactor Building.

Within the Emergency Retention Basin (ERB), the 1998 confirmatory survey identified a high Cs-137 concentration of 200 pCi/g while the 1985 high concentration of Cs-137 was 90 pCi/g. The gamma characterization information from the 1998 survey showed that the dominant gamma sources are Cs-137 and Co-60.

The characterization surveys indicated that surface soils having residual contamination are present at the Emergency Retention Basin, Pentolite Ditch, Waste Handling Building (Building 1133) concrete pad, south of the Primary Pump House (Building 1134) and at the west entrance to the Reactor Building (Building 1111). Isotopic analysis indicated the radionuclides of concern for surface soil were Co-60, Sr-90, and Cs-137. Low levels of contamination were identified in rooms located on the second floor of the Reactor Office and Laboratory Building (Building 1141), while higher levels were identified in the Reactor Building (Building 1111) subsurface structures.

2.3.2 Continuing Characterization Efforts

Additional site characterization was initiated in September 2002 in accordance with MW-PL-02-004, PBRF Characterization Plan. Characterization performed under this plan initially focused on loose equipment and materials. Survey packages were developed and executed

for the characterization of these items in all buildings with the exception of the Primary Pump House. Follow up surveys were performed as necessary to meet waste characterization objectives. The characterization of loose equipment and materials included Total Surface Contamination (TSC), removable contamination, wet tritium, contact gamma measurements and off-site radiological analyses to comply with the assessment of radionuclide inventory in accordance with 10 CFR Part 61.

In late July 2003, the characterization of fixed equipment and structural surfaces was initiated. The open land areas scope of work was initiated in October 2003. As of November 2004, the following results have been reported:

- Detectable contamination has been identified in several systems where contamination was not expected to be found: specifically the Deionized Water (DI) and the Process Water systems. Total contamination up to 200,000 dpm/100 cm^2 β and 500 dpm/100cm^2 α was observed in the DI system and total contamination up to 8,000 dpm/100cm^2 β was observed in the Process Water System.
- Surveys in the Water Effluent Monitoring Station (WEMS) building indicated total contamination levels up to 8,998 dpm/100cm^2 β and 254 dpm/100cm^2 α. Loose contamination was observed at levels up to 316 dpm/100cm^2 β and 9 dpm/100cm^2 α.
- Surveys of materials stored in the Reactor Service Equipment Building (SEB) have provided indications of total contamination up to 91,375 dpm/100cm^2 β on contact with the concrete floors and up to 75,000 dpm/100cm^2 β on several pieces of loose equipment.
- Surveys in the Cold Pipe Tunnel exhibited total contamination levels of up to 92,897 dpm/100cm^2 fixed β on contact with the floor. Isotopic analysis of a sediment sample that was acquired out of the trench drain indicated the presence of Co-60 at 65.84 pCi/g and Cs-137 at 0.9345 pCi/g.
- In the Primary Pump House, total contamination was observed to levels up to 5.3 x 10^6 dpm/100cm^2 β and 598 dpm/100cm^2 α on contact with the concrete pump-support structure. Loose contamination was observed at levels up to 79,500 dpm/100cm^2 β and 104 dpm/100cm^2 α. More recent surveys in this area have indicated loose contamination of up to 99,534 dpm/100cm^2 β.
- Surveys of the Reactor Office and Laboratory Building (ROLB) indicated total contamination on various surfaces on the second floor of up to 251,682 dpm/100cm^2 β and 22,678 dpm/100cm^2 α and loose surface contamination up to 85,849 dpm/100cm^2 β and 19,003 dpm/100cm^2 α. In the New Fuel Vault in the basement, total surface contamination was observed at levels up to 38,865 dpm/100cm^2 β and 36,233 dpm/100cm^2 α and loose surface contamination up to 2,573

dpm/100cm^2 β and 9,475 dpm/100cm^2 α. Subsequent off-site analysis of smear samples taken from the New Fuel Vault and the second floor of the ROLB indicate that the majority of the activity was from U-234/U-235. Since the time this survey was performed, decontamination of the vault has occurred. However, additional areas exhibiting elevated alpha activity have been identified on the second floor of the ROLB as laboratory hood ductwork has been removed. As part of the nuclide distribution determination, a core sample was taken from the vault floor and sent for isotopic analysis. The results of the analysis did not indicate the presence of U-234/U-235, but exhibited a mixture consistent with the other Balance of Plant (BOP) samples. Additional characterization will be performed in this area as necessary to ensure the nuclide mixture in this area is consistent with the BOP mixture and is not unique.

- Surveys in the Waste Handling Building indicated total surface contamination in several floor drains at levels up to 350,000 dpm/100cm^2 β. Additionally, lead was discovered embedded in one drain with total surface contamination levels of 300,000 dpm/100cm^2 β and a contact dose rate of 85 μR/hr. A core bore sample was taken and analyzed for isotopic content. Cs-137 was detected in concentrations up to 3,150 pCi/g.

- Prior to demolition, surveys of the Fan House Stack indicated fixed contamination of up to 30,000 dpm/100cm^2 β in the base and 7,000 dpm/100cm^2 β at a height of 35 feet. Subsequently, the upper portion of the Fan House Stack was demolished using appropriate operational controls and disposed of as radioactive waste. The lower concrete base still remains.

- As a result of scan surveys performed during recent radiological characterization activities, a buried suspected irradiated bolt was discovered in the open land survey area adjacent to the Waste Handling Building. The bolt exhibited dose rates of up to 960 μR/hr. No loose contamination was detected on the bolt. The bolt was properly dispositioned as radioactive waste. No isotopic analysis was performed on the bolt prior to disposal.

- Surveys of open land areas have indicated the presence of elevated concentrations of Co-60 and Cs-137 adjacent to and south of the Waste Handling Building, to the south of the Primary Pump House and to the north of the Emergency Retention Basin (ERB). These areas were acknowledged in previous historical assessments as areas where possible spills of radioactive material had occurred. Scan surveys detected areas of elevated activity near the waste storage pad and in the storm drain catch basin above the existing water level. Scan surveys indicate that the spill area identified south of the Waste Handling Building is significantly larger than previously reported.

Additionally, Cs-137 and Co-60 were positively identified in the survey areas adjacent to the Waste Handling Building and to the north of the ERB. A scan survey conducted of the concrete pad south of the Waste Handling Building indicated that the pad, or the soil under the pad, is highly contaminated. Static measurements up to 63,289 dpm/100cm^2 β were observed. Surface soil samples indicated Cs-137 concentrations of up to 208 pCi/g. The elevated radiological indications within the ERB were expected, however not to the extent discovered. Co-60 was detected in samples up to 5.6 pCi/g and Cs-137 was detected in samples up to 54.2 pCi/g. To the east of the ERB berm adjacent to the east fence and north of the Water Effluent Monitoring Station (WEMS) structure, several surface soil samples have been taken that indicate radiological soil contamination in excess of the surface soil DCGLs. Additional characterization is being performed to bound this area.

- Historical site assessment provided by NASA contained information that the storm drain system is radiologically contaminated. The storm drain system consists of an arrangement of reinforced concrete pipe that is located approximately four feet below grade in multiple survey units to the south and east of the Reactor complex. This system was placed on top of an open trench system that was previously used as the facility drain system prior to the installation of this piping. The system empties into the WEMS. The presence of radiological contamination has been verified by survey results in several of the catch basins. However, the extent of the contamination was not been determined as of the writing of this document.
- Recent survey results from the Pentolite Ditch are summarized. The Pentolite Ditch was the primary effluent release pathway for the Plum Brook Reactor Facility, receiving water from the Water Effluent Monitoring Station and draining into the Plum Brook about 2/3 mile east of the PBRF. Areas of elevated activity were identified within the ditch and in the vicinity of the ditch. Twenty five of 64 sediment samples collected from the ditch itself contained measureable activity with concentrations of up to 7.3 pCi/g Co-60 and 519 pCi/g Cs-137. Thirty nine of 58 surface soil samples collected from the ditch banks and vicinity contained measureable activity with concentrations of up to 16.7 pCi/g Co-60 and 1020 pCi/g Cs-137.

2.4 Area Classification

In the Decommissioning Plan, the facilities and grounds were divided into survey areas and assigned initial classifications based on data from the 1985 and 1998 characterization surveys. Tables 2-1 and 2-2 list the initial FSS areas and the initial and current classifications of structures and land areas.

After the approval of the Decommissioning Plan, characterization surveys have

shown that some areas were assigned overly conservative classifications. Additional characterization has also provided more representative results in other areas, resulting in an increase in classification. Any changes in classification from the Decommissioning Plan are shown in Tables 2-1 and 2-2.

An explanation of the information and data in Tables 2-1 and 2-2 follows: The first column lists the FSS survey areas. In Table 2-1, the survey areas are organized by building with each building further subdivided by major operational or physical attributes. The survey area floor sizes (second column) were taken from drawings in "Plans of Buildings and Structures, Lewis Research Center, Plum Brook Station, Sandusky, OH," dated June 1974. Note that the designated survey areas are for preliminary design and planning purposes. The final survey area configurations will be determined during the implementation of FSS and will be controlled by an FSS Implementing procedure. The final survey area boundaries may differ from those listed in Table 2-1. The open land survey areas in Table 2-2 were based on a division of the restricted area into roughly 10 equal survey areas and the emergency retention basin.

An estimate of the total survey area size, including all surfaces (floors, walls and ceilings for structures) was calculated for each survey area and is provided for informational purposes in the fourth column of Table 2-1. The total survey area size is only estimated and is based on the product of the floor size multiplied by a conversion factor designed to account for the wall and ceiling surfaces. As part of the survey package design process described in section 5.4.3, the FSS/Characterization Engineer will calculate surface areas for each FSS survey unit, including walls and ceilings from project engineering drawings and field measurements. The estimated total area for open land areas is reported in the third column of Table 2-2.

Survey areas that exceed the maximum survey unit size as described in Table 4-1 will be sub-divided into smaller survey units during the survey design process. Each sub-divided survey unit within each of these survey areas is supported by the same operational history and characterization data listed for the survey area as a whole.

Accordingly, the sub-divided survey units will use the same classification and sigma for FSS design. Sigma is used in the FSS survey design process and is discussed further in section 5.2.3.2. The source of classification and sigma values used will be described in the FSS Survey Package for each survey unit.

For operational efficiency, some of the survey areas listed in Table 2-1 and Table 2-2 that are equal to or smaller than the maximum size listed in Table 4-1 may be subdivided into multiple survey units. Smaller survey units may be necessary to enhance the efficiency of data collection, processing, and review and serve to better support the decommissioning schedule. Conversely, some adjacent areas may be combined to form larger survey units (Table 4-1 size limits will be maintained). The fifth column in Tables 2-1 and the fourth column in Table 2-2 list the current classification of the survey area.

Some survey areas have been assigned more than one classification based on the levels of activity found on floors, lower walls, upper walls and ceilings. During the FSS design process, lower walls will typically be included and surveyed with the floor area as a survey unit. If the upper walls and ceiling surface area is of a different classification than the floor surface and lower walls (typically ≤ 2 meters), the upper walls and ceilings will be surveyed as a separate survey unit. Upper walls and ceilings in multiple adjacent survey units where the floor and lower walls are a higher class than the upper walls and ceilings may be combined into a single survey unit. Administrative controls within the Survey Data Management System (SDMS) will ensure that each survey unit will have only one classification. The use of the SDMS system is further discussed in section 5.4.3.1. The sixth column in Table 2-1 and the fifth column in Table 2-2 provide the initial classification of the survey area as stated in the Decommissioning Plan.

The seventh, eighth and ninth columns of Tables 2-1 and 2-2 present summarized characterization data and an estimate of the variability within the survey area, or sigma. The characterization data provided are the basis for the classification of the survey areas. In several Class 1 areas, particularly areas where major remediation activities will be performed, minimal or no characterization has been performed. In these cases, and in cases where current characterization data result in an unacceptably high value for sigma, the sigma values will be determined by remediation support or turnover surveys. See section 5.2.3.2 for additional detail. In survey areas where characterization has not yet been performed, the last three columns in Tables 2-1 and 2-2 state "Characterization Pending". The classification provided for areas with characterization remaining to be performed is the initial classification presented in the Decommissioning Plan. Prior to performing FSS in these areas, the classification will be verified based on the pending characterization. NRC approval is required if an area classification is lowered. Illustrations of survey areas are presented in Attachment A.

Survey areas for structures that are demolished prior to license termination will either be applied to remaining foundation or the remaining footprint (if the foundation is removed). The need to FSS soil in excavated building footprints before backfill will be evaluated on a case by case basis and documented in each respective FSS Survey Package.

2.4.1 Changes in Classification

Classification of site areas is based on historical information and site characterization data. Data from continuing characterization surveys, operational surveys in support of decommissioning, routine surveillance and any other applicable survey data may be used to increase survey area classifications (from Class 3 to Class 2 and from Class 2 to Class 1), up to the time of commencement of FSS, as long as the classification reflects conditions that existed prior to remediation. After the FSS of a given survey unit begins, the basis for any reclassification will be documented in the Survey Package. If during the conduct of a FSS survey sufficient

evidence is accumulated to warrant an investigation and reclassification of the survey unit in accordance with section 7.4, the survey may be terminated without completing the respective survey unit package.

Table 2-1 – Survey Area Classification

Facility or Survey Area	Floor Area (ft^2) [a]	Floor Area (m^2)	Estimated Total Surface Area (m^2)	FSS Classification [b]	Initial Classification [c]	Sigma [d] (dpm/100cm^2)	Mean Net Total Beta (dpm/100cm^2)	Maximum Net Total Beta (dpm/100cm^2)
Reactor Building (Building 1111):								
Inside Containment Vessel								
• Area 2 - Work Space Inside CV @ 0' (C1110 106Cx)	4,019	374	2,244	Class 1	Class 1	Char Pending	Char Pending	Char Pending
• Area 17 - Test Area Inside CV at -25' (C1110 105Cx)	1,350	126	756	Class 1	Class 1	Post Decon	Post Decon	Post Decon
• Area 18 - Canal E (C1110 111Cx)	1,281	120	720	Class 1	Class 1	Post Decon	Post Decon	Post Decon
• Area 23 - Quad A (C1110 107Cx)	803	75	450	Class 1	Class 1	Post Decon	Post Decon	Post Decon
• Area 24 - Quad B (C1110 108Cx)	813	76	456	Class 1	Class 1	Post Decon	Post Decon	Post Decon
• Area 25 - Quad C (C1110 109Cx)	803	75	450	Class 1	Class 1	Post Decon	Post Decon	Post Decon
• Area 26 - Quad D (C1110 110Cx)	637	60	360	Class 1	Class 1	Post Decon	Post Decon	Post Decon
• Area 29 - Sub-Pile Room (C1110 101Cx)	157	15	90	Class 1	Class 1	Post Decon	38,108	78,775
• Area 30 - Elevator Pit and Stair Well (C1110 102Cx/103Cx/104Cx)	210	20	120	Class 1	Class 1	Char Pending	Char Pending	Char Pending
Additional Information								
• Quad A Loose and Fixed Equipment (E1111 101Cx)							21,355	28,047
• Quad C Loose and Fixed Equipment (E1111 102Cx)							431,717	3,653,248
• Quad D & Lily Pad Loose and Fixed Equip. (E1111 103Cx)							25,040	554,678
• Quad B Loose and Fixed Equipment (E1111 104Cx)							133,778	1,887,744
• Quad D Loose and Fixed Equipment (E1111 105Cx)							120,355 88,824	1,728,637 158,320
	10,073	**941**	**5,646**					
Reactor Building (Building 1111):								
Outside Containment Vessel								
• Area 1 - General Floor Area @ grade (C1111 207Cx)	9,449	878	5,268	Class 1/2	Class 2	Char Pending	Char Pending	Char Pending
• Area 3 - Canals								
◦ Canal F (C1111 104Cx)	382	36	216	Class 1	Class 1	Post Decon	Post Decon	Post Decon
◦ Canal G (C1111 105Cx)	580	54	324	Class 1	Class 1	Post Decon	687,144	6,107,314
◦ Canal H (C1111 103Cx)	455	43	258	Class 1	Class 1	Post Decon	13,212	54,926
• *Area 4 - Shop Area* (C1111 203Cx)								

Table 2-1 – Survey Area Classification

Facility or Survey Area	Floor Area (ft^2) [a]	Floor Area (m^2)	Estimated Total Surface Area (m^2)	FSS Classification [b]	Initial Classification [c]	Sigma [d] (dpm/100cm^2)	Mean Net Total Beta (dpm/100cm^2)	Maximum Net Total Beta (dpm/100cm^2)
◦ Rooms 102 &103, Exp Ctrl Annex	806	75	450	Class 3	Class 2	220	144	551
◦ Room 104, Office	400	38	228	Class 3	Class 2			
◦ Room 105, Office	441	41	246	Class 3	Class 2			
• *Count Rooms* (C1111 204Cx)								
◦ Room 5, Experiment Control Room	1,156	108	648	Class 3	Class 2	608	335	1952
◦ Room 6, Counting	80	8	48	Class 3	Class 2			
◦ Room 7, Janitor Closet	124	12	72	Class 3	Class 2			
◦ Room 8, Restroom	498	47	282	Class 3	Class 2			
◦ Room 9, Locker	197	19	114	Class 3	Class 2			
◦ Room 10, Personnel Decontamination [g]	120	12	72	Class 3	Class 2			
• *Area 11 - Office Area Mezzanine* (C1111 208Cx)								
◦ Room 15, Reactor Control Room	872	82	492	Class 2	Class 2	6,254	2,957	17,749
◦ Room 16, Restroom, +12 Elevation	80	8	48	Class 2	Class 2			
◦ Room 28, Storage	87	9	54	Class 2	Class 2			
◦ Rooms 202/203, Elec Equip & Parts Storage	806	75	450	Class 2	Class 2			
◦ Room 204, Office	400	38	228	Class 2	Class 2			
◦ Room 205, Office	441	41	246	Class 2	Class 2			
◦ Room 206, Office	171	16	96	Class 2	Class 2			
◦ Room 207, Office	171	16	96	Class 2	Class 2			
◦ Room 208, Office	171	16	96	Class 2	Class 2			
◦ Room 209, Office	171	16	96	Class 2	Class 2			
◦ Pipe Chase	46	5	30	Class 2	Class 2			
• Area 20 - Work Area @ -15' (C1111 202Cx) [h]	7,790	724	4,344	Class 1	Class 2	Char Pending	Char Pending	Char Pending
• Reactor Bldg Sub-basement (C1111 201Cx)								
◦ Area 21 - Work Area @ -25'	3,013	280	1,680	Class 1	Class 2	7,720	6,280	25,058
◦ Area 22 - Pump Room Area + Roof	1,366	127	762	Class 1/2	Class 2			
• Penthouse Areas (C1111 209Cx)								
◦ Room 31, East Penthouse	N/A	N/A	N/A	N/A[i]	Class 2	Char Pending	Char Pending	Char Pending
◦ Room 32, West Penthouse	N/A	N/A	N/A	N/A[i]	Class 2			
• Area 33 - Air Lock 1 & 2 (C1111 206Cx)	121	12	72	Class 1	Class 1	Char Pending	Char Pending	Char Pending
	30,840	**2,878**	**17,268**					
• Building Exterior (C1111 301Cx)								

Table 2-1 – Survey Area Classification

Facility or Survey Area	Floor Area (ft^2) [a]	Floor Area (m^2)	Estimated Total Surface Area (m^2)	FSS Classification [b]	Initial Classification [c]	Sigma [d] (dpm/100cm^2)	Mean Net Total Beta (dpm/100cm^2)	Maximum Net Total Beta (dpm/100cm^2)
◦ Building Roof	28,084	2,609	2,609	Class 2	N/A	Char Pending	Char Pending	Char Pending
◦ Building Exterior Walls	13,110	1,218	1,218	Class 3	N/A			
Additional Information								
• Reactor Bldg Loose and Fixed Equipment (C1111 101Cx)							1,061	148,117
• Rx Bldg & Canal E Loose and Fixed Equip (C1111 106Cx)							252,936	13,079,207
	82,107	**7,646**	**26,741**					
Hot Laboratory (Building 1112):								
• *Hot Cells* (C1112 107Cx)								
◦ Room 1, Hot Cell #1	342	32	192	Class 1	N/A	Post Decon	1,547,828	11,664,262
◦ Room 2, Hot Cell #2	138	13	78	Class 1	N/A			
◦ Room 3, Hot Cell #3	96	9	54	Class 1	N/A			
◦ Room 4, Hot Cell #4	64	6	36	Class 1	N/A			
◦ Room 5, Hot Cell #5	64	6	36	Class 1	N/A			
◦ Room 6, Hot Cell #6	64	6	36	Class 1	N/A			
◦ Room 7, Hot Cell #7	64	6	36	Class 1	N/A			
• Mezzanine above Hot Cells 1-2 (C1112 109Cx)	1,000	93	558	Class 1	Class 1/2	Post Decon	151,979	597,660
• Mezzanine above Hot Cells 3-7 (C1112 110Cx)	1,005	94	564	Class 1	Class 1/2	Post Decon	989,411	4,462,502
• Cold Work Areas (C1112 203Cx)								
◦ Room 8, Cold Work Area + Air Lock	2,219	207	1,242	Class 1	Class 2	Post Decon	11,398	288,801
◦ Room 8A, Vestibule	44	5	30	Class 2	Class 2			
◦ Room 9, Manipulator Repair Shop	409	38	228	Class 1	Class 2			
◦ Room 10, Office	117	11	66	Class 2	Class 2			
• Lavatory Areas (C1112 205Cx)								
◦ Room 11, Locker Area	217	21	126	Class 1	N/A	Post Decon	11,834	78,234
◦ Room 12, Cold Lavatory	142	14	84	Class 1	N/A			
◦ Area 13 - Pipe Space	61	6	36	Class 1	N/A			
◦ Room 14, Change Room	183	18	108	Class 1	N/A			
◦ Room 15, Hot Lavatory	279	26	156	Class 1	N/A			
◦ Room 15A, Closet	24	3	18	Class 1	N/A			
• Room 16, Hot Work Area (C1112 202Cx)	2,155	201	1,206	Class 1	N/A	Post Decon	628,257	1,667,274

Table 2-1 – Survey Area Classification

Facility or Survey Area	Floor Area (ft^2) [a]	Floor Area (m^2)	Estimated Total Surface Area (m^2)	FSS Classification [b]	Initial Classification [c]	Sigma [d] (dpm/100cm^2)	Mean Net Total Beta (dpm/100cm^2)	Maximum Net Total Beta (dpm/100cm^2)
• Hot Handling Area (C1112 106Cx)								
◦ Room 17, Hot Handling Room	692	65	390	Class 1	Class 1/2	Post Decon	Post Decon	Post Decon
◦ Area 26 - Valve Pit	184	18	108	Class 1	N/A			
• Area 18 - Canal J (C1112 105Cx)	435	41	246	Class 1	Class 1	Post Decon	Post Decon	Post Decon
• Hot Dry Storage (C1112 103Cx)								
◦ Room 19, Hot Dry Storage	900	84	504	Class 1	N/A	Post Decon	Post Decon	Post Decon
◦ Room 19A, Off-Gas Clean-up	174	17	102	Class 1	N/A			
• Room 19, Removable Slabs & area above HDS (C1112 111Cx)	793	74	444	Class 1	N/A	Post Decon	Post Decon	Post Decon
• Area 20 - Canal K (C1112 104Cx)	799	75	450	Class 1	Class 1	Post Decon	Post Decon	Post Decon
• Decontamination Areas (C1112 204Cx)								
◦ Room 21, Storage + Roof	246	23	138	Class 1	Class 1/2	Post Decon	396,111	1,602,360
◦ Room 22, Repair Shop	646	61	366	Class 1	Class 1/2			
◦ Room 23, Decontamination Room	387	36	216	Class 1	Class 1/2			
◦ Room 24, Storage	591	55	330	Class 1	Class 1/2			
• Hot Pipe Tunnel (C1112 108Cx)								
◦ Area 25A - Hot Pipe Tunnel	1,413	132	792	Class 1	Class 1	Post Decon	Post Decon	Post Decon
◦ Area 25B - Hot Pipe Tunnel	1,474	137	822	Class 1	Class 1			
◦ Area 25C - Hot Pipe Tunnel	1,112	104	624	Class 1	Class 1			
• Room 27, Mezzanine (C1112 112Cx)	1,412	132	792	Class 1	Class 1/2	Char Pending	Char Pending	Char Pending
• Building Exterior (C1112 301Cx)								
◦ Building Roof	14,134	1,313	1,313	Class 2	N/A	265	360	917
◦ Building Exterior	14,047	1,305	1,305	Class 3	N/A			
Additional Information								
• Hot Cells Loose Equipment & Material (C1112 101Cx)							10,691,780	61,910,893
• Hot Lab Loose Equipment & Material (C1112 201Cx)							412,081 60,008	33,401,830 205,752
	48,126	**4,487**	**13,832**					
Reactor Service Equipment Building (1131)								
• SEB First Floor Areas (D1131 403Cx)								
◦ Area 1 - Shop & Equipment	2,218	207	1,242	Class 1/3	Non-Impacted	321	545	1,134
◦ Room 1, Chem. Lab & Record	394	37	222	Class 2/3	Non-Impacted			

Table 2-1 – Survey Area Classification

Facility or Survey Area	Floor Area (ft^2) [a]	Floor Area (m^2)	Estimated Total Surface Area (m^2)	FSS Classification [b]	Initial Classification [c]	Sigma [d] (dpm/100cm^2)	Mean Net Total Beta (dpm/100cm^2)	Maximum Net Total Beta (dpm/100cm^2)
◦ Room 2, Counting	143	14	84	Class 2/3	Non-Impacted			
◦ Room 3, Office	173	17	102	Class 2/3	Non-Impacted			
◦ Room 4, Corridor	104	10	60	Class 2/3	Non-Impacted			
◦ Room 5, Office	87	9	54	Class 2/3	Non-Impacted			
◦ Room 6, Locker	162	16	96	Class 2/3	Non-Impacted			
◦ Room 7, Janitor's Closet	28	3	18	Class 2/3	Non-Impacted			
◦ Room 8, Restroom Vestibule	16	2	12	Class 2/3	Non-Impacted			
◦ Room 9, Vestibule	52	5	30	Class 2/3	Non-Impacted			
◦ Room 10, Corridor	195	19	114	Class 2/3	Non-Impacted			
◦ Room 11, Control Room	1,083	101	606	Class 2/3	Non-Impacted			
◦ Room 12, Chlorine	105	10	60	Class 2/3	Non-Impacted			
◦ Room 13, Water Treatment	3,752	349	2,094	Class 2/3	Non-Impacted			
◦ Room 15, Boiler	1,667	155	930	Class 2/3	Non-Impacted			
◦ Room 16, Parts and Storage	290	27	162	Class 2/3	Non-Impacted			
◦ Room 17, Vertical Lift	149	14	84	Class 2/3	Non-Impacted			
◦ Room 18, Engine Room	5,372	500	3,000	Class 2/3	Non-Impacted			
• SEB Mezzanine Areas (D1131 404Cx)								
◦ Room 1A, Instrument Repair	221	21	126	Class 3	Non-Impacted			
◦ Room 2A, Instrument Repair	270	26	156	Class 3	Non-Impacted			
◦ Room 3A, Instrument Repair	320	30	180	Class 3	Non-Impacted	1,819	1,564	4,859
◦ Area 14 - Mezzanine	358	34	204	Class 2/3	Non-Impacted			
◦ Room 19, Chemical Storage	1,526	142	852	Class 2/3	Non-Impacted			
◦ Room 19A, Chemical Storage	393	37	222	Class 1/3	Non-Impacted	Post Decon	12,791	91,375
• Cold Pipe Tunnel (D1131 406Cx)								
◦ Area 23 - CPT (under SEB)	1,890	176	1,056	Class 1	Class 3			
◦ Area 23 - CPT (from 1131 to 1152)	1,098	103	618	Class 1	Class 3			
◦ Area 23 - CPT (under 1152)	570	53	318	Class 1	Class 3			
◦ Area 23 - CPT (from 1151 to 1152)	366	35	210	Class 1	Class 3	Post Decon	21,824	92,897
◦ Area 23 - CPT (under 1151)	111	11	66	Class 1	Class 3			
◦ Area 23 - CPT (from 1111 to 1131)	2,347	219	1,314	Class 1	Class 3			
• SEB Basement Areas (D1131 402Cx)								
◦ Room 20, Auxiliary Equipment	1,020	95	570	Class 3	Non-Impacted	319	501	1,021
◦ Room 21, Water Treatment Pump	1,543	144	864	Class 3	Non-Impacted			
◦ Area 22 - Clear Well	423	40	240	Class 3	Non-Impacted			

Table 2-1 – Survey Area Classification

Facility or Survey Area	Floor Area (ft^2) [a]	Floor Area (m^2)	Estimated Total Surface Area (m^2)	FSS Classification [b]	Initial Classification [c]	Sigma [d] (dpm/100cm^2)	Mean Net Total Beta (dpm/100cm^2)	Maximum Net Total Beta (dpm/100cm^2)
◦ Area 24 - Generator/Compressor Pit	460	43	258	Class 3	Non-Impacted			
◦ Room 25, Electrical & Batteries	914	85	510	Class 2/3	Non-Impacted			
◦ Area 26 - Pit	88	9	54	Class 3	Non-Impacted			
◦ Closet, Basement	40	4	24	Class 3	Non-Impacted			
• Building Exterior (D1131 405Cx)								
◦ Building Roof	16,985	1,578	1,578	Class 2	N/A	199	467	699
◦ Building Exterior Walls	4,123	383	383	Class 3	N/A			
Additional Information								
• SEB Loose Equipment & Material (D1131 401Cx)							294 75	74,070 2,071
	51,056	**4,763**	**18,773**					
Fan House Building (1132):								
• First Floor Operating Area (C1132 201Cx)								
◦ Room 1, Operating Area	2,772	258	1,548	Class 1	Class 1/2	Char Pending	Char Pending	Char Pending
◦ Room 2, Restroom	94	9	54	Class 1	Class 1/2			
◦ Room 3, Janitor's Closet	55	6	36	Class 1	Class 1/2			
◦ Room 4, Deionizer	155	15	90	Class 1	Class 1/2			
◦ Room 5, Office	64	6	36	Class 1	Class 1/2			
• Basement Areas (C1132 102Cx)								
◦ Room 6, Air Monitor	174	17	102	Class 1	Class 1	Post Decon	Post Decon	Post Decon
◦ Room 7, Sump Room	217	21	126	Class 1	Class 1			
◦ Room 8, Equipment Room	2,906	270	1,620	Class 1	Class 1			
◦ Area 9, Tunnel to Rx Bldg 1111	420	40	240	Class 1	Class 1			
◦ Area 10, Stairwell	96	9	54	Class 1	Class 1			
◦ Resin Pit	136	13	78	Class 1	Class 1			
◦ Pipe Trench	183	18	108	Class 1	Class 1			
• Building Exterior (C1132 301Cx)								
◦ Building Roof	3,897	362	362	Class 2	N/A	186	99	580
◦ Building Exterior Walls	4,445	413	413	Class 2	N/A			
	15,614	**1,457**	**4,867**					
Waste Handling Building (1133):								
• Operating Areas (C1133 104Cx)								
◦ Room 1, Operating Area	1,951	182	1,092	Class 1	Class 1/2	Post Decon	Post Decon	Post Decon
◦ Room 2, Decontamination	414	39	234	Class 1	Class 1/2			

Table 2-1 – Survey Area Classification

Facility or Survey Area	Floor Area (ft^2) [a]	Floor Area (m^2)	Estimated Total Surface Area (m^2)	FSS Classification [b]	Initial Classification [c]	Sigma [d] (dpm/100cm^2)	Mean Net Total Beta (dpm/100cm^2)	Maximum Net Total Beta (dpm/100cm^2)
◦ Area 16 - Stair Housing	97	10	60	Class 1	N/A			
• Laundry Area (C1133 201Cx)								
◦ Room 3, Laundry	222	21	126	Class 1	Class 1/2	Char Pending	Char Pending	Char Pending
◦ Room 4, Clean Clothing	171	16	96	Class 1	Class 1/2			
◦ Room 5, Storage	85	8	48	Class 1	Class 1/2			
◦ Room 6, Laboratory	155	15	90	Class 1	Class 1/2			
◦ Room 7, Office	150	14	84	Class 1	Class 1/2			
◦ Room 8, Corridor	121	12	72	Class 1	Class 1/2			
◦ Room 9, Janitor's Closet	19	2	12	Class 1	Class 1/2			
◦ Room 10, Closet	15	2	12	Class 1	Class 1/2			
◦ Room 11, Contaminated Change	122	12	72	Class 1	Class 1/2			
◦ Room 12, Clean Restroom	120	12	72	Class 1	Class 1/2			
◦ Room 13, Corridor	127	12	72	Class 1	Class 1/2			
◦ Pipe Chase	21	2	12	Class 1	Class 1/2			
• Room 14, Boiler Room (1133 202Cx)	411	39	234	Class 1	Class 1/2	Char Pending	Char Pending	Char Pending
• Basement Work Areas (C1133 102Cx)								
◦ Room 15, Access & Work Area	1,563	146	876	Class 1	Class 1	Post Decon	Post Decon	Post Decon
◦ Room 19, Access Tunnel	347	33	198	Class 1	Class 1			
• Evaporator Work Areas (C1133 103Cx)								
◦ Room 17, Preparation	406	38	228	Class 1	Class 1	Post Decon	Post Decon	Post Decon
◦ Room 18, Evaporator	406	38	228	Class 1	Class 1			
• Mezzanine (C1133 105Cx) [1]	1,350	126	756	Class 1	N/A	Char Pending	Char Pending	Char Pending
• Building Exterior (C1133 301Cx)								
◦ Building Roof	4,726	439	439	Class 2	N/A	164	16	349
◦ Building Exterior Walls	3,821	355	355	Class 2	N/A			
	14,869	**1,391**	**4,376**					
Primary Pump House (1134)								
• Interior Rooms (C1134 201Cx)								
◦ Room 1, Pump	171	16	96	Class 1	Class 2	Post Decon	1,052,432 1,046,611	5,288,932 4,986,792
◦ Room 2, Pump	171	16	96	Class 1	Class 2			
◦ Room 3, Pump	171	16	96	Class 1	Class 2			
◦ Room 4, Heat Exchanger	1,073	100	600	Class 1	Class 2			
◦ Room 5	149	14	84	Class 1	Class 2			
◦ Room 6, Bypass Deionizer	257	24	144	Class 1	Class 2			

Table 2-1 – Survey Area Classification

Facility or Survey Area	Floor Area (ft^2) [a]	Floor Area (m^2)	Estimated Total Surface Area (m^2)	FSS Classification [b]	Initial Classification [c]	Sigma [d] (dpm/100cm^2)	Mean Net Total Beta (dpm/100cm^2)	Maximum Net Total Beta (dpm/100cm^2)
• Exterior Rooms (C1134 202Cx)								
◦ Room 7	636	60	360	Class 1	Class 2	Post Decon	6,998	275,028
◦ Room 8	990	92	552	Class 1	Class 2			
◦ Mezzanine	544	51	306	Class 1	Class 2			
• Resin Pit (C1134 203Cx)	136	13	78	Class 1	Class 2	Post Decon	Post Decon	Post Decon
• Building Exterior (C1134 301Cx)								
◦ Building Roof [j]	5,220	485	485	Class 1	N/A	294	115	713
◦ Building Exterior Walls	4,316	406	406	Class 1	N/A			
	13,834	**1,293**	**3,303**					
Reactor Office and Laboratory Building (1141)								
• Area 1, Northeast Stair Hall (C1141 203Cx)	291	28	168	Class 2	Class 2	631	818	1,575
• Elevator Areas (C1141 202Cx)								
◦ Area 2, Elevator & Shaft	60	6	36	Class 2	Class 2	380	249	941
◦ Area 3, Elevator Machinery	143	14	84	Class 2	Class 2			
• Vault Areas (C1141 206Cx)								
◦ Area 4, Cold Test Area	2,491	232	1,392	Class 1	Class 2	8,234 400	3,204 586	38,865 2,155
◦ Area 5, Airway	700	66	396	Class 1	Class 2			
◦ Area 8, Vestibule	99	10	60	Class 1	Class 2			
◦ Area 9, Restroom	82	8	48	Class 1	Class 2			
◦ Area 10, Janitor's Closet	38	4	24	Class 1	Class 2			
◦ Area 11, Building Service Equipment	1,767	165	990	Class 2	Class 2			
◦ Area 14, Tool Crib	265	25	150	Class 2	Class 2			
◦ Area 15, General Shop Area	813	76	456	Class 2	Class 2			
◦ Area 16, Telephone Exchange	303	29	174	Class 2	Class 2			
◦ Area 17, Vault	188	18	108	Class 1	Class 2			
• Area 6, Sump (C1141 208Cx)	530	50	300	Class 1	Class 2	321	209	781
• Area 7, Crawl Space (C1141 210Cx)	3,782	352	2,112	Class 3	Class 2	121	450	608
• Instrument Areas (C1141 207Cx)								
◦ Area 12, Counting Rooms	357	34	204	Class 2	Class 2	880	715	2,589
◦ Area 13, Electronic Shop	317	30	180	Class 2	Class 2			
◦ Area 13A, Calibration Room	177	17	102	Class 2	Class 2			
• Utility Tunnel (C1141 209Cx) [k]	2,064	192	192	Class 1	N/A	Post Decon	Post Decon	Post Decon
• First Floor Offices (C1141 211Cx)								
◦ Lobby	505	47	282	Class 3	Class 2	565	263	1,664

Table 2-1 – Survey Area Classification

Facility or Survey Area	Floor Area (ft^2) [a]	Floor Area (m^2)	Estimated Total Surface Area (m^2)	FSS Classification [b]	Initial Classification [c]	Sigma [d] (dpm/100cm^2)	Mean Net Total Beta (dpm/100cm^2)	Maximum Net Total Beta (dpm/100cm^2)
◦ Room 100, Office	214	20	120	Class 3	Class 2			
◦ Room 101, Office	214	20	120	Class 3	Class 2			
◦ Room 102, Office	214	20	120	Class 3	Class 2			
◦ Room 103, Office	209	20	120	Class 3	Class 2			
◦ Room 104, Office	176	17	102	Class 3	Class 2			
◦ Room 105, Office	191	18	108	Class 3	Class 2			
◦ Room 106, Office	176	17	102	Class 3	Class 2			
◦ Room 107, Office	214	20	120	Class 3	Class 2			
◦ Room 108, Office	197	19	114	Class 3	Class 2			
◦ Room 109/110/111, Classroom	653	61	366	Class 2/3	Class 2			
◦ Room 121, Conference	484	45	270	Class 2/3	Class 2			
◦ Room 122, Office	300	28	168	Class 2/3	Class 2			
◦ Room 123, Office	197	19	114	Class 2/3	Class 2			
◦ Room 124, Office	200	19	114	Class 2/3	Class 2			
◦ Room 125, Office	200	19	114	Class 2/3	Class 2			
◦ Room 126, Office	212	20	120	Class 2/3	Class 2			
◦ Restroom, Men's, +0 Elevation	177	17	102	Class 2	Class 2			
◦ Restroom, Women's +0 Elevation	158	15	2	Class 2	Class 2			
◦ Lavatory, +0 Elevation	32	3	18	Class 2	Class 2			
◦ Janitor's Closet, +0 Elevation	30	3	18	Class 2	Class 2			
◦ Pipe Chase, +0 Elevation	39	4	24	Class 2	Class 2			
◦ Hallways, +0 Elevation North/South	307	29	174	Class 3	Class 2			
• First Floor Work Areas (C1141 212Cx)								
◦ Room 112, First Aid	303	29	174	Class 2	Class 2			
◦ Room 113, Office	100	10	60	Class 2	Class 2			
◦ Room 114, Health & Safety Operations	406	38	228	Class 2	Class 2			
◦ Room 115, Office	341	32	192	Class 2	Class 2	1,028	528	3,026
◦ Room 116, Receiving	209	20	120	Class 2	Class 2			
◦ Room 117/118, Electronic Laboratory	768	72	432	Class 1/2	Class 2			
◦ Room 119/120, Electronic Laboratory	642	60	360	Class 1/2	Class 2			
◦ Hallways, +0 Elevation East/West	1,725	161	966	Class 2	Class 2			
• Middle Stairwell (C1141 204 Cx)	196	19	114	Class 2	Class 2	436	497	1,527
• Southeast Stairwell (C1141 205Cx)	196	19	114	Class 2	Class 2	2,080	1,490	6,438
• Second Floor Offices (C1141 213Cx)								

Table 2-1 – Survey Area Classification

Facility or Survey Area	Floor Area (ft^2) [a]	Floor Area (m^2)	Estimated Total Surface Area (m^2)	FSS Classification [b]	Initial Classification [c]	Sigma [d] (dpm/100cm^2)	Mean Net Total Beta (dpm/100cm^2)	Maximum Net Total Beta (dpm/100cm^2)
◦ Room 200, Office	202	19	114	Class 3	Class 2	742	305	3,564
◦ Room 201, Office	214	20	120	Class 3	Class 2			
◦ Room 202, Office	214	20	120	Class 3	Class 2			
◦ Room 203, Office	214	20	120	Class 3	Class 2			
◦ Room 216, Office	214	20	120	Class 3	Class 2			
◦ Room 217, Library	480	45	270	Class 3	Class 2			
◦ Room 218, Office	214	20	120	Class 3	Class 2			
◦ Room 219, Office	214	20	120	Class 3	Class 2			
◦ Room 220, Office	214	20	120	Class 3	Class 2			
◦ Room 221, Office	214	20	120	Class 3	Class 2			
◦ Room 222, Office	523	49	294	Class 3	Class 2			
◦ Room 223, Office	214	20	120	Class 3	Class 2			
◦ Restroom, Men's, +12 Elevation	134	13	78	Class 2	Class 2			
◦ Restroom, Women's +12 Elevation	45	5	30	Class 2	Class 2			
◦ Janitor's Closet 1, +12 Elevation	28	3	18	Class 3	Class 2			
◦ Hallways, +12 Elevation North/South	727	68	408	Class 3	Class 2			
• Second Floor Work Areas (C1141 214Cx)								
◦ Room 204, Materials Laboratory	345	33	198	Class 1	Class 2	65,994	39,099	293,254
◦ Room 205, Materials Laboratory	301	28	168	Class 1	Class 2			
◦ Room 206, Materials Laboratory	345	33	198	Class 1	Class 2			
◦ Room 207, Chem. Lab Storage	352	33	198	Class 1	Class 2			
◦ Room 207A, Counting	160	15	90	Class 1	Class 2			
◦ Room 208, Office	164	16	96	Class 1	Class 2			
◦ Room 208A, Darkroom	133	13	78	Class 1	Class 2			
◦ Room 208B, Darkroom	133	13	78	Class 1	Class 2			
◦ Room 209, Chem. Laboratory	312	29	174	Class 1	Class 2			
◦ Room 210, Chem. Laboratory	312	29	174	Class 1	Class 2			
◦ Room 211/212, Chem. Laboratory	695	65	390	Class 1	Class 2			
◦ Room 213, Chem. Laboratory	349	33	198	Class 1	Class 2			
◦ Room 213A, Chem. Laboratory	362	34	204	Class 1	Class 2			
◦ Room 214/215, Chem. Laboratory	417	39	234	Class 1	Class 2			
◦ Janitor's Closet 2, +12 Elevation	23	3	18	Class 1	Class 2			
◦ Pipe Chase, +12 Elevation	33	4	24	Class 1	Class 2			
◦ Hallways, +12 Elevation East-West	855	80	480	Class 1	Class 2			

Table 2-1 – Survey Area Classification

Facility or Survey Area	Floor Area (ft^2) [a]	Floor Area (m^2)	Estimated Total Surface Area (m^2)	FSS Classification [b]	Initial Classification [c]	Sigma [d] (dpm/100cm^2)	Mean Net Total Beta (dpm/100cm^2)	Maximum Net Total Beta (dpm/100cm^2)
• Building Exterior (C1141 215Cx)								
◦ Building Roof	11,540	1,072	1,072	Class 2	N/A	366	595	1,093
◦ Building Exterior Walls	18,675	1,735	1,735	Class 3	N/A			
Hot Retention Area (1155)								
• All Areas (C1155 102Cx)	4,050	377	2,262	Class 1	Class 1	Char Pending	Char Pending	Char Pending
Reactor Security Building (1191)								
• All Areas (D1191 401Cx)						222	177	523
• Room 100, Visitor Control	470	44	264	Class 3	Non-Impacted			
• Room 101, Utility	28	3	18	Class 3	Non-Impacted			
• Room 102, Furnace	52	5	30	Class 3	Non-Impacted			
• Lavatory	34	4	24	Class 3	Non-Impacted			
• Building Exterior (C1191 402Cx)	1,701	158	158	Class 3	Non-Impacted	91	-12	138
	2,285	**214**	**494**					

[a] Note: The majority of the numerical values provided in the floor areas (ft^2) column were taken from Plans of Buildings and Structures, Lewis Research Center, Plum Brook Station, dated June 1974. In locations where that document did not provide numerical values for the "floor" areas, drawings were used to estimate the "floor" surface areas.

[b] Note: Unless otherwise noted Class X/Y designates the floors, and lower walls are Class X while the upper walls and Ceilings are Class Y.

[c] Note: Initial Classifications derived from table 4-2 of the Decommissioning Plan.

[d] Note: Large Sigma values for areas specified in this table shall be recalculated using post decontamination survey information.

[e] Note: Portions of the ROLB Roof supported ventilation blowers from the laboratories below. The area (East/West Section) where the blowers were removed shall be treated as Class 1. All other areas shall be treated as Class 2.

[f] Note: Structure demolished or expected to be demolished prior to FSS. Any concrete structure remaining shall be classified according to the classification of the open land survey areas containing the structure and surveyed appropriately.

[g] Note: Area classification increased based on a review of the historical use of the area as an area for the decontamination of contaminated personnel.

[h] Note: Area classification increased due to contaminated systems being removed the areas resulting in a personnel contamination event.

[i] Note: Area classified as a Class 1 area due to the contamination area posting present during the early phases of the project.

[j] Note: Area classified as a Class 1 areas due to the removal of highly contaminated components from the pump house rooms through the roof penetrations and the discovery of discrete particles during the initial scoping surveys.

[k] Note: Area classified as a Class 1 area due to the high contamination area posting present during the early phases of the project.

Table 2-2 – Environmental Survey Area Classification

PBRF Survey Area	Survey Area (ft^2)[a]	Survey Area (m^2)	FSS Classification[b]	Initial Classification[c]	Package ID	Isotope	Sigma[d] (pCi/g)	Mean Measurement (pCi/g)	Maximum Measurement (pCi/g)
Emergency Retention Basin									
• All Areas (A2100 101Cx)	60,000	5,575	Class 1	Class 1	C1	^{60}Co ^{137}Cs	0.6009 9.7326	0.56406 13.079	2.1436 37.653
					C3	^{60}Co ^{137}Cs	1.727 18.690	2.149 37.72	7.610 81.940
					C4	^{60}Co ^{137}Cs	0.1143 1.128	0.1381 1.224	0.7049 4.459
Effluent Pathways									
• Drainage Systems (Storm Sewers) (A2200 101Cx)	N/A	N/A	Class 1	Class 1	C1	^{60}Co ^{137}Cs	Char Pending	Char Pending	Char Pending
• Pentolite Ditch & Environs (A2300 101Cx)	574,000	53,327	Class 1	Class 1/Non-impacted	C1	^{60}Co ^{137}Cs	1.737 109.3	1.120 37.51	16.65 1,019
Environmental Areas									
• South Southwest Unit (A2400 301Cx)	125,000	11,613	Class 2/3	Class 3	C1	^{60}Co ^{137}Cs	0.01326 0.10468	0.05172 0.29297	0.08278 0.48578
					C2	^{60}Co ^{137}Cs	0.16979 0.09363	0.11662 0.21873	0.87453 0.44134
					C3	^{60}Co ^{137}Cs	0.02906 0.07320	0.06827 0.09891	0.08004 0.2587
• South Southeast Corner (A2400 302Cx) Note: Contains the WEMS Spill area, the south ERB berm and portions of the east and west ERB berm.	122,891	11,417	Class 1/2	Class 1/3	C1	^{60}Co ^{137}Cs	0.01164 0.07518	0.04291 0.23082	0.06650 0.36748
					C2	^{60}Co ^{137}Cs	6.0365 39.250	1.8708 15.327	37.151 217.90
					C3	^{60}Co ^{137}Cs	0.03374 0.7132	0.07008 0.2687	0.1639 5.293

Table 2-2 – Environmental Survey Area Classification

PBRF Survey Area	Survey Area (ft^2)[a]	Survey Area (m^2)	FSS Classification[b]	Initial Classification[c]	Package ID	Isotope	Sigma[d] (pCi/g)	Mean Measurement (pCi/g)	Maximum Measurement (pCi/g)
• Southwest Unit (A2400 303Cx) Note: Contains portions of the WHB Spill Area and the Waste Storage Pad.	125,000	11,613	Class 1/2/3	Class 1/3	C1	^{60}Co ^{137}Cs	0.00181 48.003	0.04259 19.657	0.04662 150.58
					C2	^{60}Co ^{137}Cs	0.09183 95.371	0.09689 110.51	0.22770 207.50
					C3	^{60}Co ^{137}Cs	0.03692 26.73	0.07894 0.08724	0.1263 153.2
					C4	^{60}Co ^{137}Cs	0.02039 2.566	0.05180 0.6389	0.09207 22.52
• Southeast Unit (A2400 304Cx) Note: Contains the north ERB berm and portions of the east and west ERB berm.	105,895	9,838	Class 1/2	Class 3	C1	^{60}Co ^{137}Cs	0.00741 0.08350	0.04558 0.26198	0.06258 0.42556
					C2	^{60}Co ^{137}Cs	0.01652 0.1658	0.07273 0.2793	0.08990 1.060
					C3	^{60}Co ^{137}Cs	0.02478 0.4235	0.05683 0.2109	0.08088 2.606
• Northwest Unit (A2400 305Cx) Note: Contains the HRA, WHB, FH, portions of the Hot Lab, and portions of the WHB spill area.	108,608	10,091	Class 1/2	Class 1/3	C1	^{60}Co ^{137}Cs	0.02666 0.47620	0.05054 0.51620	0.10171 1.5203
					C2	^{60}Co ^{137}Cs	0.02459 0.2784	0.07325 0.3151	0.1377 1.449
• Northeast Unit (A2400 306Cx) Note: Contains the CRA's and ERB Spill Areas	117,542	10,921	Class 1/2	Class 3	C1	^{60}Co ^{137}Cs	0.01475 0.09803	0.04701 0.23683	0.07637 0.38934
					C2	^{60}Co ^{137}Cs	0.06809 1.261	0.1199 0.5769	0.3239 8.185
• North Northwest Unit (A2400 307Cx) Note: Contains the Rx Bldg, ROLB, PPH, portions of the Hot Lab, and PPH resin spill area.	74,626	6,933	Class 1/2	Class 1/3	C1	^{60}Co ^{137}Cs	0.00421 0.12943	0.03420 0.26071	0.03973 0.49599
					C2	^{60}Co ^{137}Cs	0.00735 0.02758	0.03369 0.05655	0.05632 0.12184
					C3	^{60}Co ^{137}Cs	132.0 0.1697	86.46 0.365	604.8 0.7686

Table 2-2 – Environmental Survey Area Classification

PBRF Survey Area	Survey Area (ft^2)[a]	Survey Area (m^2)	FSS Classification[b]	Initial Classification[c]	Package ID	Isotope	Sigma[d] (pCi/g)	Mean Measurement (pCi/g)	Maximum Measurement (pCi/g)
• North Northeast Unit (A2400 308Cx) Note: Contains the SEB, and portions of the Sludge Basins and Precipitator.	121,072	11,248	Class 1/2	Class 3	C1	^{60}Co ^{137}Cs	0.00401 0.11521	0.04431 0.26315	0.05089 0.43784
					C2	^{60}Co ^{137}Cs	0.7439 24.50	1.216 4.595	4.914 162.3
					C3	^{60}Co ^{137}Cs	0.01902 0.05269	0.05014 0.08165	0.06873 0.3466
• Northern Unit (A2400 309Cx) Note: Contains portions of the Precipitator and portions of the Sludge Basins.	110,287	10,246	Class 1/2/3	Class 3	C1	^{60}Co ^{137}Cs	0.01073 0.09318	0.04560 0.23966	0.07090 0.39998
					C2	^{60}Co ^{137}Cs	0.01325 0.1390	0.04299 0.2868	0.05908 0.7121
• Far Northern Unit (A2400 310Cx) Note: Contains the Compressor Bldg, Gas Storage Structure and Cryogenic and Gas Supply Farm.	89,817	8,345	Class 3	Class 3	C1	^{60}Co ^{137}Cs	0.00925 0.16384	0.04903 0.30677	0.06385 0.61130
					C2	^{60}Co ^{137}Cs	0.02835 0.1667	0.06782 0.3156	0.1038 0.7604
					C3	^{60}Co ^{137}Cs	0.01718 0.06154	0.04392 0.09394	0.05579 0.2161
• Open land areas outside the PBRF Fence (A2500 301I1) Note: Areas to serve as buffer zones to impacted areas inside the fence (estimated)	1,524,748	141,649	Class 1/3[e]	N/A	C1	^{60}Co ^{137}Cs	0.7930 4.036	0.6555 2.106	4.567 19.080
	3,259,486	**302,816**							

a. Area estimated from facility drawings.
b. Characterization Survey Units are not necessarily reflective of the FSS survey unit breakdown.
c. Initial classifications taken from Table 4-2 of the Decommissioning Plan.
d. Large Sigma values for areas specified in this table will be reevaluated prior to establishing values for final status survey design (using supplemental characterization or post remediation survey information).

3.0 RADIOLOGICAL CONTAMINANTS AND DCGL

The goal of the PBRF decommissioning project is to release the site for unrestricted use in compliance with the NRC's annual dose limit of 25 mrem/yr plus ALARA. The NRC dose limits apply to residual radioactivity that is distinguishable from background.

Site-specific dose assessments were performed to calculate the DCGL for surface soil, structures, and embedded pipe. The surface soil DCGL may conservatively be applied to subsurface soil. RESRAD 6.21, RESRAD 6.0, RESRAD-BUILD 3.22, and the Microshield code were used for these dose assessments. Model input parameters were developed and justified for each assessment.

During the development of the FSSP, it was determined that a modification of the previously approved Building Reuse and Subsurface Structure dose assessments and DCGL calculations was necessary. The dose assessments and DCGL calculations for surface soil, Building Reuse and Subsurface Structure scenarios are described in detail in Attachment B, "Approach and Basis for Development of Site-Specific Derived Concentration Guideline Levels (DCGL)" of this FSSP. Any future changes to modeling parameters will be made in accordance with the license conditions that govern revisions to the Final Status Survey Plan.

3.1 Site-Specific DCGL for Soil and Structures

The DCGLs for surface soils and structures are listed in Tables 3-1 and 3-2, respectively. The DCGLs listed in Tables 3-1 and 3-2 will not be increased without first seeking NRC approval.

Table 3-1 DCGLs for Surface Soils

Radionuclide	DCGL (pCi/g)
Co-60	3.8
Sr-90	5.4
Cs-137	14.7

The structure DCGLs (designated as $DCGL_s$) are listed in Table 3-2. The $DCGL_S$ are the surface activity level in dpm/100 cm^2 that will be used during FSS to determine compliance with the 25 mrem/yr unrestricted use criterion.

Table 3-2 Structure DCGLs

Radionuclide	$DCGL_S$ (dpm/100 cm^2)
Co-60	11,000
Sr-90	33,100
Cs-137	40,500
Eu-154	4,500
H-3	9.1E+06
I-129	14,900
U-234	31,500
U-235	27,100
U-236	33,200

3.2 DCGL for Other Media

Other media that will undergo FSS include subsurface soil, remaining concrete foundation pads (for buildings that are released in accordance with the operational release program), and possibly buried pipes such as storm drains. Note that current plans call for the removal of storm drains. The DCGL for foundation pads and buried piping (if present) will be the same as BOP structure DCGL. Buried pipe is any pipe not encased in concrete, such as the storm drains.

The DCGL for any sediment and/or sludge will be the same as the surface soil. The DCGL for subsurface soil will be the same as surface soil.

3.3 Radionuclide Mixture for FSS

The radionuclides listed in Tables 3-1 and 3-2 were selected after a detailed evaluation of the current characterization data including concrete core samples and smears collected for 10 CFR Part 61 analyses. The evaluation of radionuclide mixtures and the relevance of the mixtures to implementing FSS are described in Attachment A, "Radionuclide Distribution Basis for DCGL Determination, and FSS of PBRF". Based on this evaluation, those radionuclides that were less than 10% in aggregate of the total dose for both structural scenarios and soils were eliminated and the mixtures were readjusted to 100% based on the relative fractions of the radionuclides remaining after the insignificant radionuclides were removed. The adjusted FSS mixtures, and the corresponding DCGL listed in Tables 3-1 and 3-2 were used to calculate surrogate and gross beta DCGL for structural surfaces and surrogate calculations for volumetric analysis of soils. While it is believed that the nuclide mixtures and distributions presented in Attachment A and summarized in the following sections are comprehensive and indicative of the nuclide distributions present at the facility, future characterization may result in additional distributions and/or modifications to isotopic mixtures. In this event, any resulting revisions to this

Final Status Survey Plan, Attachment A and adjusted gross DCGL calculations will be submitted for NRC review (and approval) if required by license conditions.

3.3.1 Soil Mixture

For soil, the doses from all radionuclides other than Cs-137, Co-60, and Sr-90 totaled 0.5 mrem/yr. Because this dose is 2% of the 25 mrem/yr limit, all of the radionuclides other than Cs-137, Co-60, and Sr-90 were eliminated from further consideration. To ensure the 25 mrem/yr criterion is met, any open land survey unit where the mean of FSS results indicates that the dose may be greater than 24.5 mrem/yr shall be reviewed for compliance with the unrestricted use limit. This review will be documented as part of the survey unit release record. The final radionuclide mixture to be used for DCGL determination is provided in Table 3-3.

Table 3-3 Radionuclide Mixture for Soil

Radionuclide	Mixture Distribution
Cs-137	0.890
Co-60	0.026
Sr-90	0.084

3.3.2 Structure Mixture

Based on data reviewed to date and considering the PBRF operational history, there appear to be three distinct radionuclide mixtures represented in the on site structures. The first applies to the Hot Laboratory, the second to the remaining structures designated as BOP and the third to the Reactor Office and Laboratory Building (ROLB). All mixtures were evaluated.

The results of all RESRAD-Build runs, i.e. BOP, ROLB and Hot Lab mixtures in the Subsurface Structure and Building Reuse scenarios indicate that for the smear sample population, the aggregate dose from six radionuclides, i.e., Cs-137, Sr-90, Co-60, H-3, Eu-154 and I-129 resulted in 94% or more of the 25 mrem/yr limit in all BOP cases, the aggregate dose from five radionuclides, i.e., Cs-137, Sr-90, Co-60, H-3, and Eu-154 resulted in 93% or more of the 25 mrem/yr limit in all Hot Lab cases and the aggregate dose from seven radionuclides, i.e., Cs-137, Sr-90, Co-60, H-3, I-129, U-234 and U-235 resulted in 93% or more of the 25 mrem/yr limit in all ROLB cases (see Attachment A). Therefore, all remaining radionuclides were eliminated.

For the core sample population, the aggregate dose from four radionuclides, i.e., Cs-137, Sr-90, Co-60 and H-3, resulted in 90% or more

of the 25 mrem/yr limit in all BOP cases and the aggregate dose from three radionuclides, i.e., Cs-137, Sr-90 and Co-60 resulted in 92% or more of the 25 mrem/yr limit in all Hot Lab cases (see Attachment A). Therefore, all remaining radionuclides were eliminated. A nuclide distribution based upon core sample analysis results can not be calculated for the ROLB due to the fact that no positive core sample results were available for the ROLB.

While acknowledging that the DCGL calculations do include an assumption that up to 10% removable contamination will be present, which is best represented by the smear sample mixture, the radiological nuclide distribution found in concrete core samples is more representative of the actual condition of structures that will remain and be subjected to FSS because the majority of loose contamination will be removed during remediation. Therefore, it is concluded that the nuclide distributions derived from the cores samples are appropriate and conservative when applied to structural surfaces outside of the ROLB. As no positive core sample results were available for the ROLB, the smear nuclide distribution for the ROLB was used.

The lowest total aggregate dose from the remaining radionuclides was 90% of the 25 mrem/yr criterion, which means that radionuclides potentially representing a dose of 2.5 mrem/yr were eliminated. To ensure the 25 mrem/yr criterion is met, any structural survey unit where the mean of FSS results indicates that the dose may be greater than 22.5 mrem/yr dose should be reviewed for compliance with the unrestricted use limit. The FSS radionuclide mixtures, as established in Attachment A, are listed in Table 3-4.

Table 3-4 FSS Radionuclide Mixtures for Structures

	Hot Laboratory	Balance of Plant	ROLB
Co-60	.0079	.0784	.0101
Cs-137	.8345	.4145	.1729
H-3	ND	.3535	.3971
I-129	ND	ND	.0282
Sr-90	.1577	.1536	.0417
U-233/234	ND	ND	.3382
U-235/236	ND	ND	.0119

*ND – Not Detected

3.4 Surrogate DCGL, Gross Beta Activity and the Unity Rule

Difficult-to-detect radionuclides (non-gamma emitters for soil and non-beta emitters for structures) will be addressed by using a surrogate relationship to another detectable radionuclide as recommended in NUREG-1575 (MARSSIM). A common example would be to relate a specific radionuclide, such as cesium-137, to one or more radionuclides of similar characteristics such as Sr-90. This directly applies to PBRF as gamma spectroscopy will be used to assess volumetric soil samples in comparison against the DCGL for soil. In such cases,

to demonstrate compliance with the release criteria for the survey unit, the DCGL for the surrogate radionuclide, in this case Cs-137, must be scaled to account for the fact that it is being used as an indicator for an additional radionuclide, Sr-90. The result is referred to as the surrogate DCGL.

For structural surfaces, the final DCGL for FSS design and implementation will be a gross beta DCGL that represents the unrestricted use criterion of 25 mrem/yr. There are two steps required to determine the gross beta DCGL; 1) perform a surrogate calculation to account for radionuclides that cannot be readily measured by a beta detector (e.g., plastic beta scintillation, gas proportional) with typical efficiency; and, 2) perform a gross activity DCGL calculation on the surrogate DCGL values and other beta emitting radionuclides determined to be present in significant fractions. The equations to be used were derived in NUREG-1505, "A Nonparametric Statistical Methodology for the Design and Analysis of Final Status Decommissioning Surveys" and are listed below.

3.4.1 Surrogate Equation

The surrogate DCGL is computed based on the distribution ratio between the difficult-to-detect radionuclides and the easy-to-detect radionuclides. The surrogate DCGL is computed as follows:

$$Surrogate_{DCGL} = \frac{1}{\left[\left(\frac{1}{DCGL_{Sur}}\right)+\left(\frac{R_2}{DCGL_2}\right)+\left(\frac{R_3}{DCGL_3}\right)+\cdots\left(\frac{R_n}{DCGL_n}\right)\right]}$$

Where: $DCGL_{Sur}$ = Surrogate radionuclide DCGL

$DCGL_{2,3...n}$ = DCGL for radionuclides to be represented by the surrogate

R_n = Ratio of concentration (or nuclide mixture fraction) of radionuclide "n" to surrogate radionuclide

For soils, using the DCGL presented in Table 3-1 and the soil nuclide distribution presented in Table 3-3, the following surrogate calculations can be performed;

$$DCGL_{s(Cs-137)} = \frac{1}{\left[\left(\frac{1}{14.7_{(Cs-137)}}\right)+\left(\frac{.0836/.8908}{5.4_{(Sr-90)}}\right)\right]} = 11.71 \quad pC/g$$

For structural surfaces, using Cs-137 as a surrogate for H-3 and I-129, the nuclide mixtures for structures presented in Table 3-4 and the structure DCGL presented in Table 3-2, the following surrogate calculations can be performed;

3.4.1.1 Balance of Plant

$$DCGL_{s(Cs-137)} = \frac{1}{\left[\left(\frac{1}{4.05E^{4}_{(Cs-137}}\right)+\left(\frac{.3535/.4145}{9.10E^{6}_{(H-3)}}\right)\right]} = 4.03E^{4}\ dpm/100cm^{2}$$

3.4.1.2 ROLB (Beta)

$$DCGL_{s(Cs-137)} = \frac{1}{\left[\left(\frac{1}{4.05E^{4}_{(Cs-137)}}\right)+\left(\frac{.3971/.1729}{9.10E^{6}_{(H-3)}}\right)+\left(\frac{.0282/.1729}{1.49E^{4}_{(I-129)}}\right)\right]} = 2.79E^{4}\ dpm/100cm^{2}$$

3.4.2 Gross Beta and Alpha Equation

$$DCGL_{GB} = \frac{1}{\left[\left(\frac{f_1}{DCGL_1}\right)+\left(\frac{f_2}{DCGL_2}\right)+\left(\frac{f_3}{DCGL_3}\right)+\ldots\left(\frac{f_n}{DCGL_n}\right)\right]}$$

Where: $DCGL_{GB}$ = gross beta (or alpha) DCGL

f_n = mixture fraction of radionuclide "n" and

$DCGL_n$ = DCGL of radionuclide "n".

Note 1: The gross beta equation may also be used to calculate a gross alpha DCGL for application in areas where DCGLs are established for alpha emitters.

Note 2: Mixture fraction of a surrogate radionuclide is the equal to the fraction of the surrogate radionuclide alone.

Note 3: The value of 1 in the numerator is replaced by the actual fraction of beta (or alpha) emitters if less than 100% of the mixture.

Using the surrogate calculation presented above for Cs-137 and the nuclide mixtures for structures presented in Table 3-4 and the structure $DCGL_S$ presented in Table 3-2, the following gross beta calculations can be performed;

3.4.2.1 Balance of Plant

$$DCGL_{GB} = \frac{\left(.6465_{\Sigma\ adj\text{-}nuclide\ fractions\ [note2]}\right)}{\left[\left(\frac{.4145}{4.03E^{4}_{(Cs-137}}\right)+\left(\frac{.0784}{1.10E^{4}_{(Co-60)}}\right)+\left(\frac{.1536}{3.31E^{4}_{(Sr-90)}}\right)\right]} = 29{,}329\ dpm/100cm^{2}$$

3.4.2.2 Hot Laboratory

$$DCGL_{GB} = \frac{1.00}{\left[\left(\frac{.8345}{4.05E^{4}_{(Cs-137}}\right)+\left(\frac{.0079}{1.10E^{4}_{(Co-60)}}\right)+\left(\frac{.1577}{3.31E^{4}_{(Sr-90)}}\right)\right]} = 38{,}341\ dpm/100cm^{2}$$

3.4.2.3 ROLB

Beta

$$DCGL_{GB} = \frac{\left(.2247_{\Sigma\, adj\text{-}nuclide\text{-}fractions\ \{note2\}}\right)}{\left[\left(\frac{.1729}{2.79E^{4}_{(Cs-137}}\right)+\left(\frac{.0101}{1.10E^{4}_{(Co-60)}}\right)+\left(\frac{.0417}{3.31E^{4}_{(Sr-90)}}\right)\right]} = 26{,}798\ dpm/100cm^2$$

Alpha

$$DCGL_{GA} = \frac{\left(.3501_{\Sigma\, adj\text{-}nuclide\text{-}fractions\ \{note2\}}\right)}{\left[\left(\frac{.3382}{3.15E^{4}_{(U-233/234)}}\right)+\left(\frac{.0119}{2.71E^{4}_{(U-235/236)}}\right)\right]} = 31{,}327\ dpm/100cm^2$$

3.4.3 Unity Rule Equation

The unity rule is typically used as the first test to evaluate compliance with radiological criteria for license termination when more than one radionuclide has been determined to be potentially present. In lieu of a single gross beta (or alpha) DCGL, a unity rule calculation is used to demonstrate compliance with the structure surface unrestricted use limit. The unity rule is also typically be used as the first test to demonstrate compliance with surface soil limits. A surrogate DCGL, if applicable, would be used in the unity rule calculation. The unity rule is:

$$\frac{C_1}{DCGL_1} + \frac{C_2}{DCGL_2} + \ldots\ldots\ldots \frac{C_n}{DCGL_n} \leq 1,$$

Where:

C_n = concentration of radionuclide n and

$DCGL_n$ = DCGL of radionuclide n.

Due to the fact that two adjusted gross DCGLs (one for alpha and one for beta) will be used in the ROLB, the unity rule must be applied to demonstrate compliance. In the event that the unity rule test fails, i.e., the calculated sum of fractions is > 1, then evaluation of individual radionuclide concentrations against their DCGLs may be performed.

3.5 Area Factors

Area factors (AF) for soil and structures were developed using the Surface Soil and Building Reuse scenarios. The Building Reuse AF also applies to the Subsurface Structure $DCGL_{ES}$ values. The AF was calculated using Co-60 to ensure the values are conservative for all radionuclides. The AF for the direct exposure pathway is lower than that of either the ingestion or inhalation pathways and Co-60 generates the highest direct exposure per pCi/g or dpm/100 cm^2. A detailed description of the AF calculations is provided in Attachment B.

The AFs for Surface Soil were calculated by first running the RESRAD code with the Surface Soil parameters and a source area of 2,000 m^2. The 2,000 m^2 source area was selected since this is the maximum survey unit size for a Class 1

area. RESRAD was then run by using source areas ranging from 1 m^2 to 250 m^2 to represent the elevated area sizes. The AF was calculated by dividing the dose result for the 2,000 m^2 source area by the dose results for the smaller elevated areas. The Surface Soil area factors are shown in Table 3-5.

The area factors for Building Reuse were calculated in an analogous manner except that an initial source area of 75 m^2 was selected to represent the floor area for the room size used in the RESRAD-BUILD modeling for the Building Reuse scenario. The elevated areas evaluated ranged from 0.25 m^2 to 50 m^2. The Building Reuse AF is listed in Table 3-6. Use of Area Factors is further discussed in Section 7.3.

Table 3-5 Surface Soil Area Factors

Elevated Area (m^2)	1	2	3	5	10	15	25	100	250	2,000
Area Factor	10.4	6.2	4.7	3.4	2.3	1.9	1.6	1.2	1.1	1

Table 3-6 Building Reuse Area Factors (Structures)

Elevated Area (m^2)	0.25	0.50	1	2	4	6	8	10	15	25	50	75
Area Factor	40.2	20.8	11.1	6.2	3.6	2.8	2.4	2.1	1.7	1.4	1.1	1

3.6 Embedded Piping DCGL and Area Factors

The PBRF contains a number of pipe runs that are embedded in concrete. PBRF has performed an assessment of safety, dose and cost associated with the removal of the embedded pipe. PBRF has concluded that the increased risk from industrial safety, the time and associated dose from the physical logistics of removing the piping would justify leaving the piping in place. In addition, the cost of removing the pipes is high and far more costly than justified by NRCs $2000/person-rem ALARA criterion. Therefore, designated sections of embedded pipe (EP) will be remediated in place, undergo FSS, and then filled with grout.

A description of the EP to remain, the cost estimate for removing the pipes, the methods to be used for remediation and FSS, and the dose assessment and adjusted gross beta DCGL calculations for the EP and attached floor drains are presented in Attachment C.

Based on the analyses, adjusted gross beta DCGL for EP was selected to represent 1 mrem/yr. The 1 mrem/yr value is arbitrary and the dose goal for EP and drains may be adjusted at the discretion of PBRF, either generically or individually. The adjusted gross beta DCGL for EP documented in Attachment C and provided in Table 3-7 would be adjusted accordingly if the dose goal were set at a value other than 1 mrem/yr. For survey units that contain embedded piping, the structure adjusted gross beta DCGL require adjustment to account for

the 1 mrem/yr (or other selected dose goal) contribution from embedded pipe. For example, the gross beta DCGL for BOP structures of 29,329 dpm/100cm^2 would require adjustment to represent 24 mrem/yr versus 25 mrem/yr to account for a 1 mrem/yr embedded piping dose. The adjusted gross beta DCGL would be 28,156 dpm/100cm^2 (29,329 dpm/100cm^2 x 24/25).

Table 3-7 Embedded Pipe and Drain DCGLs

Embedded Pipe or Drain	Adjusted Gross beta DCGL at 1 mrem/yr Dose Goal (dpm/100cm^2 Gross Beta)
Embedded Pipe (Worst-Case)	50,500
Individual Floor Drain (Check 1)	45,000
Two 5586 Drains in Quadrant C (Check 2)	45,900
Two Drains in Hot Dry Storage (Check 5)	36,300
Cut Open Ends of PWPs in Primary Pump House (Check 7)	19,100

The average length of the EP sections to remain is 19 m (63 feet). The area factors were developed using methods that are directly analogous to those recommended for structures in NUREG-1575 (MARSSIM). First, the dose from a 19-meter (63-foot) length of 10-inch pipe was calculated. Additional dose assessments were performed at lengths ranging from 0.08 m (0.25 feet) to 6.1 m (20 feet). The ratio of the dose at 19 m (63 feet) to the dose at each smaller length is the area factor.

Table 3-8 lists the EP area factors. As an additional control, the number of elevated areas will be limited to ensure that the total inventory remaining in each EP will be maintained at the level that would be present if the entire pipe were contaminated at the DCGL level.

Table 3-8 Embedded Pipe Area Factors

Pipe Length m (feet)	mrem/hr	Area Factor
19 (63)	2.59E-11	1.00E+00
6.1 (20)	2.59E-11	1.00E+00
3.0 (10)	2.49E-11	1.04E+00
1.5 (5)	1.91E-11	1.36E+00
0.61 (2)	9.18E-12	2.82E+00
0.30 (1)	4.74E-12	5.46E+00
0.15 (0.5)	2.39E-12	1.08E+01
0.08 (0.25)	1.20E-12	2.16E+01

4.0 ESTABLISHING SURVEY UNITS

4.1 Survey Unit

Each survey area listed in Tables 2-1 and 2-2 may be divided into discrete survey units. Survey units are areas that have similar characteristics and contamination levels. Survey units are assigned only one classification. The site and facility are surveyed, evaluated, and released on a survey unit basis.

4.1.1 Survey Unit Size

Survey units are typically limited in size to ensure each area is assigned an adequate number of data points. The survey unit sizes for PBRF are provided in Table 4-1. Note that the maximum survey unit size for Class 1 structures is 75 m^2, which is smaller than the 100 m^2 recommended in NUREG-1575 (MARSSIM). The 75 m^2 maximum was required to be consistent with the site-specific building reuse dose assessment assumptions.

Per NUREG-1575 (MARSSIM), section 4.6, special considerations will be given to survey units with structure surface areas less than 10 m^2 or land areas less than 100 m^2. In these cases, the number of data points obtained from the statistical tests is unnecessarily large and not appropriate for smaller survey unit areas. Instead, some specified level of survey effort will be determined on a case-by-case basis. The data generated from these smaller survey units will be obtained based on judgment, rather than on systematic or random design, and compared individually to the DCGL.

Table 4-1 Survey Unit Areas for PBRF FSS

Class	Recommended Survey Unit Area	
	Structures	**Land**
1	up to 75 m^{2*}	up to 2000 m^2
2	75 to 1000 m^2	2000 to 10,000 m^2
3	to 10,000 m^2	to 100,000 m^2

* includes floor only

4.1.2 Site Reference Coordinate System (Reference Grid)

A reference coordinate system is used for impacted areas to facilitate the identification of the location of measurements and samples within the survey unit. The reference coordinate system is basically an X-Y plot of the site area referenced to an established fixed point monument. Once the reference point is established, grids may be overlaid parallel to lines of latitude and longitude.

5.0 SURVEY DESIGN

This section describes the methods and data required to determine the number and location of measurements or samples in each survey unit, the coverage fraction for scan surveys, and requirements for measurements in background reference areas. The design activities described in this section will be documented in a survey package for each survey unit. Survey design includes the following:

- Scan Survey Coverage
- Sample Size Determination
- Background Reference Areas, as necessary
- Reference Grid and Sample Location

Section 5.4.3 describes the process for designing, developing and reviewing survey packages.

5.1 Scan Survey Coverage

The area covered by scan measurement is based on the survey unit classification as described in NUREG-1575 (MARSSIM), section 5.5.3. A 100% accessible area scan of Class 1 survey units will be required. The emphasis will be placed on scanning the higher risk areas of Class 2 survey units such as soils, floors and lower walls. Scanning percentage of Class 3 survey units will be performed on likely areas of contamination based on the judgment of the FSS/Characterization engineer.

Table 5-1 Minimum Scan Survey Coverage

	Scan Measurements		
	Class 1	Class 2*	Class 3
Scan Coverage	100%	10 to 100%	Minimum of 10%

* For Class 2 Survey Units, the percentage of scan coverage will be proportional to the potential for finding contamination that is close to the DCGL in accordance with NUREG-1575 (MARSSIM), section 5.5.3. PBRF will use the characterization results to correlate contamination levels to scan coverage levels.

5.2 Sample Size Determination

NUREG-1575 (MARSSIM), section 5.5.2 describes the process for determining the number of survey measurements necessary to ensure that a data set is sufficient for statistical analysis. Sample size is based on the relative shift, the Type I and II errors, and the specific statistical test used to evaluate the data.

Alternate processes may be used if those processes gain NRC and industry acceptance between the time this plan is adopted and the commencement of final

survey activities. However, any new technologies must still meet the applicable requirements of this plan for calibration, detection limit, areal coverage, operator qualification, etc.

5.2.1 Determining Which Test Will Be Used

Statistical tests will be used, as necessary, to determine if the FSS results are below the DCGL. See Tables 9-1 and 9-2 for the criteria to be used to determine if a statistical test is required and which test is to be used. The Sign test or Wilcoxon Rank Sum (WRS) test will be implemented using unity rules, surrogate methods, or combinations of unity rules and surrogates, as described in NUREG-1575 (MARSSIM) and NUREG-1505 chapter 11.

The Sign test is expected to be the most appropriate test for PBRF FSS results because background is expected to constitute a small fraction of the DCGL. If a situation is encountered where background is a significant fraction of the DCGL, the Wilcoxon Rank Sum (WRS) test may be used. An alternative to the WRS test is to subtract material specific and/or gamma background from each FSS direct measurement and apply the Sign test to the net results. The material specific background would be the average value for a given material as determined from a reference area survey unit. The subtraction of a material background is not anticipated to be used at PBRF. The subtraction of the gamma background is more likely.

The gamma background may be determined by either location specific direct shielded measurements or general area ambient backgrounds.

Direct shielded background measurements would be collected concurrent with and at the same location as the static survey measurement. A shield is placed over the detector window to shield beta contributions to the measurement. The resulting instrument response will be due to gamma radiation only and will be subtracted from the combined unshielded beta-gamma reading resulting in a beta only measurement.

An alternative to using the direct shielded background value is to use the ambient background, which would be measured at a location within a given survey area or survey unit that is of sufficient distance (or attenuation) from the surfaces to eliminate beta particles that originate from the surfaces from reaching the detector. At such a location, the instrument response will be due only to gamma radiation and will be used as the background component of all surface measurements in the survey unit. The ambient background location would be selected to be representative of the entire survey unit. If a representative location cannot be found then the direct shielded background method should be used.

5.2.2 Establish Decision Errors

The probability of making decision errors is controlled by hypothesis testing. The survey results will be used to select between one condition (the null hypothesis) and an alternate condition (the alternative hypothesis). These hypotheses, chosen for NUREG-1575 (MARSSIM), scenario A, are defined as follows:

- Null Hypothesis (H_0): The survey unit does not meet the release criteria.
- Alternate Hypothesis (H_a): The survey unit does meet the release criteria.

A Type I decision error would result in the release of a survey unit containing residual radioactivity above the release criteria. It occurs when the null hypothesis is rejected when it is true. The probability of making this error is designated as "α". A Type II decision error would result in the failure to release a survey unit when the residual radioactivity is below the release criteria. This occurs when the Null Hypothesis is accepted when it is not true. The probability of making this error is designated as "β".

Appendix A of NUREG 1757 recommends using a Type I error probability (α) of 0.05 and states that any value for the Type II error probability (β) is acceptable. Following the NUREG 1757 guidance, α will be set at 0.05. The Type I decision error will not be increased without prior NRC approval. The β for this project initially has been chosen to be 0.10, or 10 percent probability based on site specific considerations. Since the β is the licensee's risk, the PBRF project may choose to vary this value from 0.25, or 25 percent to 0.05 or 5 percent after evaluating the resulting change in the number of required survey measurements and the risk of unnecessarily investigating and/or remediating survey units that are truly below the release criteria.

5.2.3 Relative Shift

The relative shift (Δ / σ) is calculated as follows:

$$\frac{\Delta}{\sigma} = \frac{(DCGL_w - LBGR)}{\sigma}.$$

Delta (Δ) is equal to the $DCGL_w$ minus the Lower Boundary of the Gray Region (LBGR). Calculation of sigmas is discussed in section 5.2.3.2 and values are provided in Table 2-1. The sigmas used for the relative shift calculation may be recalculated based on the most current data obtained from post-remediation or post-demolition surveys; or from background reference areas (for Class 3 areas), as appropriate. The LBGR is initially set at 0.5 times the $DCGL_w$, but may be adjusted to obtain an optimal value for the relative shift of normally between 1 and 3.

5.2.3.1 Lower Boundary of the Gray Region

The Lower Boundary of the Gray Region (LBGR) is the point at which the Type II (β) error applies. The default value of the LBGR is set initially at 0.5 times the DCGL. If the relative shift is greater than 3, then the number of data points, N, listed for the relative shift values of 3 from Table 5-5 or Table 5-3 in NUREG 1575 (MARSSIM) will normally be used as the minimum sample size. Use of a relative shift greater than 3 requires approval by the FSS/Characterization Manager.

5.2.3.2 Sigma

All available scoping and characterization survey results were used to determine the estimated standard deviation, or sigma value for FSS design in accordance with NUREG 1575 (MARSSIM) section 5.5.2.2. The use of the sigma values from the characterization data will be conservative for the sample size determination since any recalculated post-remediation sigma(s) are expected to be smaller.

NUREG 1575 (MARSSIM) recommends a survey population of 5 to 20 as sufficient to successfully establish this parameter. For performance of characterization surveys at PBRF, a minimum survey population of eight sample locations was chosen. For Class 2 and 3 survey units, the measurement and sample locations chosen were biased to areas with the highest potential for contamination based upon scan results. If scan results indicated no contamination, eight randomly selected locations were chosen.

For Class 1 survey areas/units, to the extent that ambient dose rates allowed, the degree of scan surveys performed were sufficient to allow for the adequate bounding of areas of radiological contamination within these areas, and to provide sufficient radiological information to develop waste volume estimates and remediation plans. Subsequently, in many Class 1 areas, the measurement and sample locations were biased to areas with the highest potential for contamination. Consequently, the sigma values for these areas are not presented in Tables 2-1 and 2-2 because they are unacceptably large. This applies to several survey areas in the Reactor Building, Hot Laboratory and Primary Pump House. After these areas are remediated, the sigma values are expected to be significantly lower.

Following remediation in these areas, new sigma values will be calculated by taking post-remediation measurements in the survey area at about 5 to 20 locations as recommended in section 5.5.2.2 of NUREG 1575 (MARSSIM). The sigma value determination will be documented in the Survey Package for each survey unit. For the purpose of making post-remediation measurements for sigma determination, multiple survey areas may be combined if the areas have similar pre-remediation contamination characteristics.

The sigma values for survey areas listed in Table 2-1 that contain survey units with two different classifications will be evaluated to ensure that the survey area sigma conservatively represents the contaminant distribution of each associated survey unit. Otherwise, a specific sigma value may be developed for each survey unit.

5.2.4 Wilcoxon Rank Sum (WRS) Test Sample Size

The number of data points, N, to be obtained from each reference area or survey unit are determined using Table 5-3 in NUREG-1575 (MARSSIM). The table includes the recommended 20% adjustment to ensure an adequate sample size.

5.2.5 Sign Test Sample Size

The number of data points is determined from Table 5-5 in NUREG-1575 (MARSSIM) for application of the Sign Test. This table includes the recommended 20% adjustment to ensure an adequate sample size. Table 5-5 would also be used to determine sample size if net measurement result values are used after background subtraction.

5.2.6 Elevated Measurement Comparison (EMC) Sample Size Adjustment

If the scan Minimum Detectable Concentration (MDC) in a Class 1 survey unit is greater than the $DCGL_W$, the sample size will be calculated using the equation provided below. No adjustment is required in a Class 2 or 3 survey unit. If N_{EMC} exceeds the statistically determined sample size (N), N_{EMC} will replace N.

$$N_{EMC} = \frac{A}{A_{EMC}},$$

Where: N_{EMC} = elevated measurement comparison sample size

A = survey unit area and

A_{EMC} = area corresponding to the area factor calculated using the MDC_{scan} concentration.

5.3 Background Reference Areas

Background reference area measurements are required when the WRS test is used, and background subtraction may be used with the Sign test, under certain conditions. Details pertaining to the use of this approach are provided in section 5.2.1.

As part of the site characterization process at PBRF, background reference areas were selected and surveyed in accordance with characterization procedure PBRF-CS-016, Material Background Determination. In accordance with the procedure, the FSS/Characterization group identified known material types within the PBRF facility that will comprise the structures or open land areas anticipated to be surveyed during FSS. The structural and soil reference areas

selected were comprised of material and soil types similar to those found at the PBRF site. The background reference areas selected included the Space Power Facility (SPF) and PBS Engineering Building for structural materials and the open lands adjacent to Fox Road for soils and sediment. Both of these areas are away from the PBRF facility and were not impacted by its operation.

The reference area measurements were collected using instrumentation, methods and protocols required for a Class 3 final survey unit. The results of the material background surveys are documented in characterization survey packages G9000-401B1 and H9000-401B1.

No significant variations in material background were observed during the performance of the background study described. Should it become necessary to acquire additional background measurements and if significant variations are encountered, then appropriate evaluations will be performed. As noted in NUREG 1727, Appendix E, Section 3.4, the Kruskal-Wallis test can be conducted in such circumstances to determine that there are no significant differences in the mean background concentrations among potential reference areas. If material background subtraction is performed, the sigma value used will take into account the variability of material background.

5.4 Sample Grid and Sample Location

Sample location is a function of the number of measurements required, the survey unit classification, and the contaminant variability.

5.4.1 Sample Grid

The reference grid is primarily used for reference purposes and is illustrated on sample maps. Physical marking of the reference grid lines in the survey unit will only be performed when necessary. For the sample grid in Class 1 and 2 survey units, a randomly selected sample start point will be identified and sample locations may be laid out in a triangular measurement or sampling grid pattern[2] at distance, L, from the start point in both the horizontal and vertical directions. The sample and reference grids are illustrated on sample maps and may be physically marked in the field. For Class 3 survey units, all sample locations are randomly selected, based on the reference grid.

Global Positioning System (GPS) instruments may be used in open land areas to determine reference or sample grid locations within the survey area. In addition, digital cameras may be employed to provide a more permanent record of survey location within the survey unit. When used, these photographic records will be linked to landmark and directional information to ensure reproducibility.

---

[2] Note that both NUREG 1575 and 1505 recognize both the rectangular and the triangular grid pattern grid method as acceptable.

Note that GPS is only one method that could be used to locate land survey points. PBRF has employed a site reference grid based on the establishment of fixed reference points and use of distances and angles from the fixed reference points to locate survey points. This method may also be used for FSS.

5.4.2 Measurement Locations

Measurement locations within the survey unit are clearly identified and documented for purposes of reproducibility. Measurement locations may be identified by tags, labels, flags, stakes, paint marks, geo-positioning units, photographic record, referencing to maps included in the survey package, or other methods.

NUREG-1575 (MARSSIM) allows for the use of both triangular and rectangular reference grid to determine measurement or sampling patterns and spacing. The triangular grid is generally more efficient for locating small areas of elevated activity, however the use of either triangular or rectangular grid patterns is acceptable. The type of grid pattern selected will be at the discretion of the FSS/Characterization Manager.

In a triangular grid, the spacing (L) between data points is determined by:

$$L = \sqrt{\frac{A}{0.866N}}$$

Where A = Survey unit Area in square meters and

N = Number of data points required.

In a rectangular grid, the spacing (L) between data points is determined by:

$$L = \sqrt{\frac{A}{N}}$$

Where A = Survey unit Area in square meters and

N = Number of data points required.

To simplify the designation of data points while assuring a sufficient number of data points are obtained for statistical purposes, the value of L is rounded to the next lowest whole meter unless the calculated value is less than one. If the systematic pattern does not provide sufficient data points to satisfy the number determined, additional data points will be identified, using a random-number technique.

For Class 1 and Class 2 survey units, after the number of measurements and the grid spacing are determined, a starting point for the survey will be established for each survey unit. This will be accomplished by selecting a reference point for the survey unit, such as the corner of the room, and using a random number generator to provide a random number between 0

and 1, for an initial offset from the reference point in both the x and y coordinates. The random number pair will be multiplied by the calculated grid spacing, providing the offset from the reference point for the first location sampling/measurement. Upon establishing the first location, the calculated spacing will be used to establish a pattern throughout the survey unit. If the survey unit includes the floor, walls and ceiling, the pattern will be extended to all surfaces from the initial points. Once established, a check is performed to ensure that the number of grid locations satisfies the calculated number of data points that are to be performed. If not, smaller spacing will be used to ensure the minimum number of measurements/samples is obtained. If a systematic survey sample point cannot be surveyed due to physical constraints, the sample point will be relocated to the closest accessible surface.

For Class 3 survey units, locations will be randomly selected. This requires generating the appropriate quantity of random number pairs that fall within the confines of the survey unit.

5.4.3 Survey Package Design Process

A FSS Package is produced for each survey area or each survey unit at the discretion of PBRF. A Survey Package will contain the following:

- Survey Package Cover Sheet & Table of Contents
- Survey Area History
- Survey Unit Description
- References
- Listing of Applicable Procedures
- Safety Instructions
- Support Instructions
- General Instructions
- Specific Survey Instructions
- Location Codes

Survey Packages are prepared by or under the direct supervision of the FSS/Characterization Engineer. Survey Packages are reviewed and approved by the FSS Manager or designee prior to implementation and Quality Control (QC) review.

5.4.3.1 Survey Package Initiation

Each survey unit and Survey Package is assigned a unique identification number. The SDMS has been developed to assist the PBRF decommissioning team in developing survey packages and managing the data generated during post remediation and FSS. To facilitate database

queries and reporting utilizing the SDMS, each final status survey unit, measurement and collected sample will have a unique survey measurement location code (LC) associated with the measurement or sample.

The survey measurement LC convention provides the ability to uniquely code each surface to be surveyed during the PBRF FSS for each survey area and/or survey unit. The LC system will also provide for measurement traceability back to a specific location on a survey area drawing and a marking at the location of the survey measurement or sample. A combination of the first two location codes becomes the designation for the survey unit and the location of the measurement. The four remaining 5 character sections designate the area classification, the material to be surveyed, the type of surface, the type of measurement and the detector used.

5.4.3.2 Review of Historical Site Assessment, Characterization Surveys

The FSS/Characterization Engineer shall perform a FSS Survey Area Historical Use Assessment for each survey unit, or reference a previously completed Historical Use Assessment prior to the design of the FSS for each survey unit.

5.4.3.3 Survey Area Walkdown

A FSS/Characterization Engineer shall perform a walkdown of the area to be surveyed to gather information about the physical characteristics of the survey area. The walkdown provides the FSS/Characterization Engineer an opportunity to determine if any physical or personnel safety related interferences are present that may affect survey design or survey implementation, and to determine any support activities necessary to implement surveys. The walkdown is documented as part of the area turnover and control process. As part of the walkdown, the FSS/Characterization Engineer shall ensure the following:

- All decommissioning and remediation activities in the survey unit have been completed.
- All tools and equipment not required to perform survey activities have been removed.
- Housekeeping and cleanup of the survey unit are completed and satisfactory.
- Engineering controls, as necessary, to prevent recontamination by adjacent decommissioning activities, have been put in place.

- Location of physical constraints for survey performance such as painted surfaces, standing water, oil, cracks or deep crevices in the surfaces to be surveyed, areas that cannot be surveyed due to detector geometry or size and other conditions that may affect survey performance. Following the walkdown, representative maps of the survey unit are prepared.

5.4.3.4 Survey Design

Survey Design is the process of determining the number, type and location of survey measurements or samples required for each survey unit. The various aspects of survey design are documented and filed in the survey package. The survey design process is controlled by approved procedures. Computer codes such as VSP™, "Visual Sample Plan," may be used in the survey design process.

The size and number of survey units for a survey area is determined based on area classification and the layout of the survey area. The FSS/Characterization Engineer will divide the area into discrete survey units as appropriate. The FSS/Characterization Engineer provides a description of the survey unit including survey unit size, classification and location. The types of material (i.e. soil, concrete, etc.) found in the survey unit and survey measurement and/or sampling methods are identified.

The FSS/Characterization Engineer calculates the number of measurements or samples required for each survey unit in accordance with section 5.2. The FSS/Characterization Engineer also calculates required investigation levels for survey measurements in accordance with Section 7.0 and Table 7-1.

The FSS/Characterization Engineer determines measurement/sample locations based on the classification of the survey unit and in accordance with Tables 2-1 and 2-2. A survey map is prepared of each survey unit. A sample and/or reference grid is superimposed on the map to provide an (x,y) coordinate system.

The FSS/Characterization Engineer generates random numbers, between 0 and 1, which are multiplied by the maximum x and y axis values of the sample grid. This provides coordinates for each sample location, or a random start location for systematic grid, as appropriate. The measurement/sample locations are plotted on the map. Each measurement/sample location is assigned a unique identification code as discussed in section 5.4.3.1.

The FSS/Characterization Engineer determines the appropriate instruments and detectors, instrument operating modes and survey methods to be used to collect and analyze data.

Using the SDMS, the FSS/Characterization Engineer will prepare written survey instructions that incorporate the requirements of the survey design. Direction is provided for selection of instruments, count times, instrument modes, survey methods, required documentation, investigation levels, investigation actions, background requirements and other appropriate instructions. The instructions also direct the appropriate instrument set up to ensure collected survey data is saved and downloaded to the appropriate files. In conjunction with the survey instructions, survey data forms, indicating desired measurements, are prepared to assist in survey documentation.

The FSS/Characterization Engineer reviews the survey design, instructions and calculations. The FSS/Characterization Engineer ensures that appropriate instruments, survey methods and sample locations have been properly identified. Once approved, the survey design and instructions are filed in the survey package.

The FSS/Characterization Manager reviews the survey package, verifies all calculations and authorizes survey implementation.

5.4.3.5 Survey Area Turnover

Prior to performing FSS, the FSS/Characterization Engineer will coordinate with the appropriate area manager to ensure decommissioning activities, area remediation, and housekeeping is complete. In accordance with an approved implementing procedure, the area will be appropriately posted to indicate that the area is controlled for the performance of FSS. A turnover survey shall be performed in all areas subjected to remediation activities, or at the discretion of the FSS/Characterization Engineer, to verify that the area meets the radiological criteria for performance of the FSS. Access controls are implemented to prevent contamination of areas during and following FSS.

5.4.3.6 Survey Implementation

Survey areas and/or locations are identified by gridding, markings, or flags as appropriate. The FSS/Characterization Engineer performs a pre-survey briefing with the survey technicians during which the survey instructions are reviewed. The technicians gather instruments and equipment as indicated and perform surveys in accordance with the survey package instructions and appropriate procedures. Technicians are responsible for documenting survey results and maintaining custody of samples and instrumentation. At the completion of surveys, technicians return instruments for downloading and prepare samples for analysis.

Survey instruments provided to the technicians are prepared in accordance with appropriate procedures and the survey instructions. Instruments are performance checked prior to and following surveys. Any data collected in data logging instruments is downloaded and a hard copy printed out. The download hard copies, surveyor's data sheets and sample counting

reports are reviewed and forwarded for inclusion in the survey package. The FSS/Characterization Engineer is notified of any data that exceed investigation criteria so that appropriate investigation surveys and remediation can be performed as necessary.

Several quality control measures and features have been developed for the implementation phase of the FSS program. These elements typically include:

- Pre-implementation briefings between FSS design and implementation personnel,
- Pre-implementation area walkdowns,
- Survey location verification,
- Daily survey area background measurements,
- Instrument source checks before and after survey activities

5.4.3.7 Data Evaluation

The FSS/Characterization Engineer reviews survey data, data downloads and counting reports to verify completeness, legibility and compliance with survey design. The FSS/Characterization Engineer performs the following:

- Converts data to reporting units
- Calculates mean, median and range of the data set
- Reviews the data for outliers
- Calculates the standard deviation of the data set
- Calculates MDC for each survey type performed
- Creates posting, frequency or quantile plots for visual interpretation of data, if necessary.

To ensure the 25 mrem/yr criterion is met, any open land survey unit where the mean of FSS results indicates that the dose may be greater than 24.5 mrem/yr shall be reviewed for compliance with the unrestricted use limit. For structures, any survey unit where the mean of structure FSS results indicates that the dose may be greater than 22.5 mrem/yr will be reviewed for compliance with the unrestricted use limit. This review will be documented as part of the survey unit release record.

The FSS/Characterization Engineer reviews and verifies the statistical calculations, verifies the integrity and usefulness of the data set and determines the need for further data. The FSS/Characterization Engineer will direct investigations as necessary. Once satisfied that the data are valid, the FSS/Characterization Engineer will perform the appropriate statistical test, if necessary, and make a decision on the radiological status

of each survey unit. The data evaluation process is documented and filed in the survey package.

5.4.3.8 Quality Control Surveys

QC surveys (replicate surveys, sample recounts, etc.) will be performed in accordance with the frequency specified in section 11.2.3. QC measurement results are compared to the original measurement results. If QC results do not agree with the original survey, an investigation is performed in accordance with section 11.2.3.3. Following investigation, the FSS/Characterization Engineer will determine data validity.

5.4.3.9 Release Record

Following data evaluation, The FSS/Characterization Engineer prepares a Release Record. The Release Record describes the survey area, survey design, survey unit, surveys performed and instruments used. The Release Record summarizes survey results and data evaluation. The Release Record is reviewed and approved by the FSS/Characterization Manager and the QC Manager.

6.0 SURVEY METHODS AND INSTRUMENTATION

6.1 Survey Measurement Methods

Survey measurements and sample collection are performed by personnel trained and qualified in accordance with the applicable procedure. The techniques for performing survey measurements or collecting samples are specified in approved procedures. Final status survey measurements include surface scans, direct surface measurements, and gamma spectroscopy of volumetric materials. Table 6-1 presents a brief summary of these techniques. In-situ gamma spectroscopy or other methods not specifically described may also be used for final status surveys. If so, PBRF will notify the NRC and request approval if required by license conditions.

Table 6-1 Survey Techniques

Measurement	Instrument Type
Scanning:	
• Alpha	• Gas proportional, Zinc Sulfide scintillation
• Beta	• Gas proportional, Geiger-Mueller, Plastic scintillation
• Gamma	• NaI (Tl) scintillation
Direct (Gross) Activity:	
• Alpha	• Gas proportional, Zinc Sulfide scintillation
• Beta	• Gas proportional, Geiger-Mueller, Plastic scintillation
Radionuclide-specific:	
• Alpha	• Radiochemical separation and alpha spectroscopy
• Beta	• Liquid Scintillation
• Gamma	• HPGe* detector based gamma spectrometer

*HPGe – High Purity Germanium.

On-site lab facilities will be used for gamma spectroscopy and gas proportional counting in accordance with applicable procedures. Off-site laboratories will be USACE validated to perform requested sample analyses and will be used, as necessary. Regardless of which facilities are used, analytical methods will be administratively established to detect levels of radioactivity at 10% to 50% of the DCGL value.

6.1.1 Structures

Structures will receive scan surveys, direct measurements and, when necessary, volumetric sampling.

6.1.1.1 Scan Surveys

Scanning is performed in order to locate small areas of residual activity above the investigation level. Beta scans will be performed over accessible floor, wall and ceiling interior surfaces and exterior walls, roof and asphalt and concrete paved areas. Additionally, alpha scans will be performed in areas where alpha contamination has been observed. Floor monitors, large area gas-flow proportional detectors (typically 580 cm^2) may be used for floor and other larger accessible horizontal and vertical surfaces. Hand-held scintillation and/or gas-flow proportional detectors (typically 125 cm^2) may be used for surfaces not accessible by the floor monitor.

Beta scanning will typically be performed with the detector position maintained within 1.27 cm (0.5 inch) of the surface and with a scanning speed of one detector width per second. Alpha scanning will typically be performed with the detector position maintained within 0.635 cm (0.25 inch) of the surface and with a scanning speed of one detector width every two seconds. If surface conditions prevent scanning at the specified distance, the detection sensitivity for an alternate distance will be determined and the scanning technique adjusted accordingly. Scanning speed will be calculated to assure the MDC_{Scan} is appropriate for the stated objective of the survey. Adjustments to scan speed and distance may be made in accordance with approved procedures. Whenever possible, technicians will monitor the audible response to identify locations of elevated activity that require further investigation and/or evaluation.

6.1.1.2 Direct Measurements

Direct measurements are performed to detect total surface activity levels. Direct measurement of surface activity will be performed at designated locations and at locations of elevated activity identified by surface scans on the structural surfaces of the buildings and on concrete or asphalt paved areas within each survey unit. These measurements may be performed using 125 cm^2 scintillation detectors, 125 cm^2 gas-flow proportional detectors, or smaller detectors as accessibility requires.

Direct measurements are conducted by placing the detector on or very near the surface to be counted and acquiring data over a pre-determined count time. A count time of one minute is typically used for surface measurements and generally provides detection levels well below the DCGL. (The count time may be varied provided the required detection level is achieved). Instrument count times will be adjusted as appropriate to achieve an acceptable MDC_{static}.

6.1.1.3 Activated Concrete

The current decommissioning strategy for PBRF calls for the removal of activated portions of the concrete bioshield and disposition of the activated concrete as radioactive waste. Any activated concrete remaining in place will be evaluated for residual radioactive contamination volumetrically using the subsurface structure DCGLs.

6.1.1.4 Volumetric Concrete Measurements

Volumetric sampling of contaminated concrete, as opposed to direct measurements may be necessary if gross beta measurements are not sufficient. Volumetric concrete samples will be analyzed by gamma spectroscopy. The results will either be evaluated by 1) calculating the derived total gross beta cpm/100 cm^2 in the sample and comparing the gross beta results directly to the gross beta DCGL or, 2) by using the radionuclide specific results to derive the surface activity equivalent and determine compliance using the unity rule. Use of the unity rule will require the use of a surrogate calculation to account for the radionuclides in the mixture not identified by gamma spectroscopy. This will be accomplished using the appropriate nuclide mixture listed in Table 3-4.

Volumetric samples analyzed by gamma spectroscopy will detect the presence of radioactivity below the surface. Such sampling is typically performed following removal of paint and other surface coatings during remediation. After analysis, the data may be converted to equivalent surface activity for analysis of surface activity in cracks or fissures.

6.1.1.5 Removable Contamination Surveys

Removable beta contamination or smear surveys will be performed to verify loose surface contamination is 10% or less of the $DCGL_W$ consistent with assumptions made during dose modeling for structural DCGL development. A smear for removable activity will be performed at each direct surface activity measurement location. A 100 cm^2 surface area will be wiped with a circular cloth or paper filter, using moderate pressure. Smear samples will be evaluated for gross beta activity (and gross alpha in the ROLB). Each survey unit with smear results exceeding the building reuse 10% modeling assumption will be evaluated on a case-by-case basis to determine if the 25 mrem/yr limit is met (see Attachment B).

6.1.2 Soil

In this context, surface soil refers to outdoor areas where the soil is, for purposes of dose modeling, considered to be uniformly contaminated from the surface down to a depth of 15 cm (6 in). These areas will be surveyed through combinations of sampling, scanning, and in-situ measurements, as appropriate. Subsurface soil refers to residual radioactivity that is underneath structures such as building floors/foundations or material that is covered with clean soil or some other non-contaminated layer.

Subsurface soil (greater than 6 inch depth) in an area that also has contaminated surface soil will be evaluated on a case-by-case basis to determine the proper treatment of the subsurface soil.

The historical site assessment should be reviewed to identify those survey areas where the potential exists for sub-surface radioactivity. Such areas can include, but are not limited to: soils under buildings; soils adjacent to building foundations or components where leakage was known or suspected to have occurred in the past; and areas where known spills of radioactive materials have occurred. Data from both the historical site assessment and any pertinent characterization data should be used to establish a bounding depth profile for any potential sub-surface radioactivity.

Subsurface soil will be sampled by collecting core samples from 15 cm (6 in) below grade to the required depth and homogenizing over each one meter of depth. The number of samples required is determined via the methods of section 5.2 of this Plan. The area factors derived for surface soil will be applied to subsurface soil in Class 1 areas.

Surface soil will receive scan surveys at the coverage level described in Table 5-1 and volumetric samples will be taken at designated locations. In accordance with DG-4006, scanning is not applicable to sub-surface activity assessments. Surface and sub-surface soil samples will be collected and prepared in accordance with approved procedures.

6.1.2.1 Scans

Gamma scanning will be performed over land surfaces to identify locations of residual surface activity. The gamma emitters are used as surrogates for the difficult to detect radionuclides. NaI gamma scintillation detectors (typically 2" x 2") will be used for these scans. Scanning may be performed by moving the detector in a serpentine pattern, while advancing at a rate not to exceed 0.5 m (20 in) per second. The distance between the detector and the surface will be maintained within 15 cm (6 in) of the surface. Audible signals should be monitored and locations of elevated direct levels identified for further investigation.

6.1.2.2 Volumetric Samples

Samples of soil, sediment, and sludge will be obtained from designated locations of land areas and at locations of elevated direct radiation identified by gamma scans. An appropriate volume of soil will be collected at each sampling location using hand trowels, bucket augers, or other suitable sampling tools.

If contamination below 15 cm (6 inch) is suspected, GeoProbe®, split spoon sampling or other methods may be used for the final survey unless the area has already been excavated and remediated. If an area containing subsurface contamination has been remediated, the excavated area, in

most cases will be treated as a surface soil area.

Sample preparation includes removing extraneous material and homogenizing and drying the soil for analysis. Separate containers are used for each sample and each container is tracked through the analysis process using a chain-of-custody record. Samples are split when required by the applicable FSS Quality Control requirements.

6.1.2.3 Stored Excavated Soil

In several areas, clean overburden soils may be removed and stockpiled on site for use as backfill materials. The primary area where this is expected to occur is the excavation of the storm drain system. These areas are primarily Class 3 areas; however the excavation and stockpile of soils from Class 2 areas is possible. Control of excavated soil and overburden materials will be maintained in accordance with approved procedures or work execution plans.

Prior to the use of stockpiled excavated soils as backfill, the soil will be subjected to FSS in accordance with the classification of the area from which it had originated. Scanning requirements and soil sample frequency shall also be determined in accordance with the classification of the area where the soil had originated.

6.1.3 Embedded Piping (EP)

It has been determined that because of industrial safety concerns and ALARA, it is not justified to remove all EP. Designated sections of EP may remain in place and undergo FSS. A detailed description of the EP designated to remain is provided in Attachment C. Embedded pipe will be remediated by hydrolazing or other methods, undergo FSS, and then filled with grout. Compliance with the DCGL developed for EP and presented in section 3.6 will be assessed through the acquisition of direct measurements using "pipe-crawling" technology and/or in-situ gamma-spectroscopy provided adequate instrument efficiencies and detection limits can be achieved. Radiological evaluations for EP that cannot be accessed directly will be performed via measurements made at traps and other appropriate access points where the activity levels are deemed to either bound or be representative of the interior surface activity levels.

6.1.4 Specific Areas and Conditions

6.1.4.1 Cracks, Crevices, Wall-Floor Interfaces and Small Holes

Surface contamination on irregular structure surfaces (e.g., cracks, crevices, and holes) are difficult to survey directly. Where no remediation has occurred and residual activity has not been detected above background, these surface blemishes may be assumed to have the same level of residual activity as that found on adjacent surfaces. The accessible surfaces are surveyed in the same manner as other structural surfaces and no special corrections or adjustments have to be made.

In situations where remediation has taken place or where residual activity has been detected above background, a representative sample of the contamination within the crack or crevice may be obtained or an adjustment for instrument efficiency may be made if justifiable.

If an instrument efficiency adjustment cannot be justified based on the depth of contamination or other geometry factors, volumetric samples will be collected. The calculated derived total gross beta dpm/100 cm^2 contained in the volumetric sample that is attributable to the beta emitting radionuclides used to determine the DCGL will be compared directly to the gross adjusted beta DCGL. As an alternative, radionuclide specific analysis, coupled with application of the unity rule may be used. In this case, the DCGL applied would be the volumetric values for the subsurface structure scenario contained in Attachment B, Table 5-14.

6.1.4.2 Paint Covered Surfaces

Final status surveys will consider the effect of painted surfaces. Gross measurements will not be used exclusively in areas covered by thick painted surfaces that are not remediated. The surfaces will be volumetrically sampled or the coating will be removed prior to survey. No special consideration must be given to wall or ceiling areas painted before plant startup and which have not been subjected to repeated exposure to materials that would have penetrated the painted surface.

6.1.4.3 Pavement-Covered Areas

The survey design of parking lots, roads and other paved areas will be based on soil survey unit sizes since they are outdoor areas where the exposure scenario is most similar to direct radiation from surface soil. The structure DCGLs presented in Table 3-2 are applicable to paved areas because the dose pathways and source geometry i.e.. area source, are essentially the same as those assumed in the Building Reuse scenario. In addition, the agricultural pathways are not applicable. The structure DCGLs are conservative since the direct dose from a 2000 m^2 outdoor area is less than the dose from the Building Reuse scenario. An outdoor occupancy time of 963 hrs is used in the Surface Soil dose assessment, whereas in the Building Reuse scenario, an occupancy time of 2340 hrs is assumed. Also, dose from the resuspension of radionuclides from paved surfaces will be less than in the Building Reuse scenario because the effective air exchange rate in an outdoor area is expected to be much higher than that seen in buildings. Scan and static beta surveys are made as determined by the survey unit design. If sub-surface contamination is suspected under paved or other covered areas, sub-surface volumetric samples will be collected. Paved areas may be separate survey units.

6.2 Instrumentation

Radiation detection and measurement instrumentation for the FSS is selected to provide both reliable operation and adequate sensitivity to detect the radionuclides identified at the site at levels sufficiently below the DCGL. Detector selection is based on detection sensitivity, operating characteristics and expected performance in the field.

Commercially available portable and laboratory instruments and detectors are typically used to perform the three basic survey measurements: 1) surface scanning; 2) direct surface contamination measurements; and 3) spectroscopy of soil and other bulk materials, such as concrete. Specific implementing procedures control the issuance, use, and calibration of instrumentation. Records supporting the instrumentation program are maintained by Document Control.

6.2.1 Selection

Radiation detection and measurement instrumentation is selected based on the type and quantity of radiation to be measured. The instruments selected for direct measurements should be capable of detecting the radiation of concern to a MDC of 50% of the applicable DCGL. The use of 50% of the DCGL is an administrative limit only. Any value below the DCGL is acceptable in Class 1 or 2 survey units. MDCs of less than 50% of the DCGL allow detection of residual activity in Class 3 survey units at an investigation level of 0.5 times the DCGL. Instruments used for scan measurements in Class 1 areas are required to be capable of detecting radioactive material at less than the $DCGL_W$.

Instrument MDCs are discussed in section 6.2.4. Instrumentation and nominal MDC values currently proposed for use in the FSS are listed in Table 6-2. PBRF follows instrument manufacturers' recommendations and/or supporting basis documents for considerations such as temperature dependency.

As the project proceeds, other measurement instruments or technologies, such as in-situ gamma spectroscopy, use of alarm rate for scan surveys versus audible response, or continuous data collection scan devices, may be found to be more efficient than the survey instruments proposed in this plan. The acceptability of such an instrument or technology for use in the final survey program would be justified in a technical basis document. The technical basis document would include among other things the following: (1) a description of the conditions under which the method would be used; (2) a description of the measurement method, instrumentation and criteria; (3) justification that the technique would provide equivalent scan coverage for the given survey unit classification and that the scan MDC is adequate when compared to the $DCGL_{EMC}$; and (4) a demonstration that the method provides data that has a Type I error (falsely concluding that the survey unit is acceptable) equivalent to 5% or

less and provides sufficient confidence that the $DCGL_{EMC}$ criterion is satisfied. The PBRF will notify the NRC and request approval of the associated technical basis document if required by license conditions.

Table 6-2 Instrument Types and Nominal MDC

Detector Model[2]	Meter Model	Application	Nominal Detection Sensitivity	
			MDC_{scan} (dpm/100cm^2)	MDC_{static}[1] (dpm/100cm^2)
Ludlum 44-9	Ludlum 2350-1	β static & scan	2900	985
Ludlum 43-5	Ludlum 2350-1	α static & scan	150	75
Ludlum 43-68 β mode	Ludlum 2350-1	β static & scan	1050	330
Ludlum 43-68 α mode	Ludlum 2350-1	α static & scan	170	70
Ludlum 44-116	Ludlum 2350-1	β static & scan	1300	415
Ludlum 43-90	Ludlum 2350-1	α static & scan	130	55
Ludlum 44-10	Ludlum 2350-1	γ scan	3.5 pCi/g ^{60}Co 6.5 pCi/g ^{137}Cs	N/A
Ludlum 43-37	Ludlum 2350-1	β scan	1000	N/A
Packard Tri-Carb 2900 TR LSC	N/A	β smear	N/A	40 (Tritium)
Canberra S5XLB or Protean IPC-9025	N/A	α and/or β smear	N/A	18
HPGe Gamma Spectroscopy System	N/A	γ Analysis	N/A	Varies

1. Based on 1-minute count time; and default values for surface efficiencies, ϵ_s, as specified in Internal Standard, ISO 7503-1.
2. Functional equivalent instrumentation may be used

6.2.2 Calibration and Maintenance

All instrumentation used for FSS (Table 6-2), including the gamma spectroscopy system, will be calibrated for normal use under typical field conditions and for the radiation types and energies of interest at the site at the frequency specified by vendor instructions or by approved PBRF procedures (at least annually not to exceed fifteen months). Calibration typically includes:

- High Voltage calibration,
- Discriminator/threshold calibration,
- Window calibration,
- Alarm operation verification, and
- Scaler calibration verification.

The detector calibration includes:

- Operating voltage determination,
- Calibration constant determination, and
- Dead time correction determination.

All instrumentation used for FSS will be operated and maintained in accordance with approved procedures. PBRF employs a vendor service to perform calibration and repair of radiological instrumentation. These services were procured in accordance with purchasing requirements for quality related services.

Radioactive sources used for calibration will be traceable to the National Institute of Standards and Technology (NIST) or equivalent standards and have been obtained in standard geometries to match the type of samples being counted. The calibration sources used for beta survey instruments are Tc-99 or Cs-137 because the average beta energy approximates the range of beta energy for the radionuclides found on surfaces on site. The alpha calibration sources are Am-241 or Th-230. Gamma scintillation detectors are calibrated using Cs-137.

Calibration labels showing the instrument identification number, calibration date and calibration due date will be attached to all portable field instruments. At a minimum, the calibration certificate and response test documentation for the current calibration cycle will be kept in the instrument history file. Documentation from previous calibration cycles may be removed from the instrument history file and transferred to Document Control.

6.2.3 Response Checks

Instrumentation response checks are conducted to assure proper instrument response and operation. An acceptable response for field instrumentation is an instrument reading within ±20% of the established check source value. Laboratory instrumentation standards will be within ± 3 sigma and not to exceed ± 20% as documented on a control chart. Response testing of portable radiological instrumentation and/or detectors used for FSS shall be performed prior to use and following use. If an instrument and/or detector are to be used for a continuous time frame greater than a standard work shift, the instrument and/or detector will be subjected to a response test prior to the end of that shift. If an instrument fails a response check, it is labeled appropriately and is removed from service until the problem is corrected in accordance with applicable procedures. Data obtained with that instrument since its previous acceptable performance check, will be evaluated for acceptability. The results of this evaluation shall be documented.

6.2.4 Minimum Detectable Concentration (MDC)

Minimum Detectable Concentration (MDC) is defined as the smallest amount or concentration of radioactive material that will yield a net positive count with a 5% probability of falsely interpreting background responses as true activity from contamination and a 5% probability of interpreting a result at the MDC level as being background. The MDC is dependent upon the counting time, geometry, sample size, detector efficiency and background count rate. As previously discussed in section 6.2.1, the MDCs will be set to approximately equal to or less than 50% of the applicable DCGL. There are two different MDCs that will be used, one for direct beta surface contamination measurements, MDC_{Static} and one for field beta scanning of surfaces, MDC_{Scan}. These are calculated differently and each will be incorporated into the operating procedures. The equation to be used for calculating the MDC_{Static} for direct beta measurements using field instrumentation is as follows:

$$MDC_{static} = \frac{3 + 3.29\sqrt{B_R \cdot t_s \cdot (1 + \frac{t_s}{t_b})}}{t_s \cdot E_{tot} \cdot \frac{A}{100}},$$

Where: MDC_{static} = Minimum Detectable Concentration (dpm/100 cm^2),

B_R = Background Count Rate (cpm),

t_b = Background Count Time (min),

t_s = Sample Count Time (min),

A = Detector Area (cm^2) and

E_{tot} = Total Efficiency.

Total Efficiency (E_{tot}) is equal to Detector Efficiency (E_i) multiplied by the applicable Surface Efficiency (E_s).

The equation that will be used to calculate the beta scan MDC_{Scan} for surfaces is as follows:

$$MDC_{scan} = \frac{d' * \sqrt{b_i} * \frac{60}{i}}{\epsilon_i * \epsilon_s * \sqrt{p} * \frac{A}{100}},$$

Where: MDC_{Scan} = Minimum Detectable Concentration (dpm/100 cm^2),

d' = Decision error taken from Table 6-5 of NUREG -1575 (MARSSIM),

i = Observation counting interval (scan speed divided by the detector width),

b_i = Background count per observation interval

ϵ_i = Detector Efficiency (c/d),

ϵ_s = Surface Efficiency (typically around 50% for beta contamination on concrete),

p = Surveyor Efficiency (typically 50%) and

A = Detector Area (cm^2).

For scanning soil with a sodium iodide gamma detector, the MDC_{Scan} values presented in Table 6.7 of NUREG -1575 (MARSSIM) will typically be used. According to NUREG-1727, these values provide an acceptable estimate of MDC_{Scan} for the survey. Separate MDC_{scan} values may be calculated for individual sodium iodide detectors configured and calibrated to detect specific radionuclides (such as Cs-137).

The MDC for the gamma spectral analysis of soil will be based on sample count times sufficient to detect a minimum of 10% of the DCGLs for the radionuclides of concern or for best sensitivity achievable. The gamma spectroscopy system planned for the project may include an ORTEC HPGe detector based system with GammaVision™ software.

The MDC for the beta counter for analysis of removable beta contamination when applicable will be based on sample count times sufficient to detect at 10% or less of the adjusted gross beta DCGL for the radionuclide mix appropriate for the survey area or for best sensitivity achievable. The verification that 10% or less of the adjusted gross beta

DCGL for the radionuclide mix appropriate for the survey area will be maintained and provided in conjunction with each sample analysis.

6.2.5 Detection Sensitivity

The nominal detection sensitivity of some of the detectors that may be used for surface contamination surveys has been determined and is provided in Table 6-2.

Count times are instrument-specific and are selected to ensure that the measurements are sufficiently sensitive for the DCGL. For example, the count times associated with surface activity surveys and gamma spectroscopy of volumetric materials are administratively manipulated to achieve MDC_{static} values less than the DCGL. The MDC_{scan} values may not always be less than the $DCGL_W$, but will be less than the $DCGL_{EMC}$.

6.2.6 Pipe Survey Instrumentation

EP designated to remain and be subjected to FSS will be surveyed to ensure residual remaining activity is less than the DCGL. Pipe crawlers (survey instruments) are typically used for surveys of pipe with diameters between 2 and 24 inches. Radiological surveys will consist of scanning and direct measurements with detection sensitivity (or MDA) adequate to detect 50% of the most limiting DCGL for EP as specified in section 3.6. In cases where piping diameters and other variables are such that there is no easy access to the piping interior, other indirect methods, such as in-situ gamma spectroscopy and/or other methodologies may be required. In these cases, PBRF will submit an associated technical basis document to the NRC in accordance with license condition requirements.

7.0 INVESTIGATION LEVELS AND ELEVATED AREAS TEST

During survey unit measurements, levels of radioactivity may be identified by an increase in count rate or an elevated sample result that warrant investigation. Elevated measurements may result from discrete particles, a distributed source, or a change in background activity. Depending on the results of the investigation, the survey unit may require no action, may require remediation, and/or may require reclassification and resurvey. Investigation levels and the investigation process are described below.

7.1 Investigation Levels

NUREG 1727 (Table E.2) and NUREG 1575 (Table 5.8) provide investigation levels for scan surveys. In addition to investigation levels for scan surveys, direct measurement survey investigation levels have also been developed. These additional investigation levels include a very conservative value for Class 3 survey units as shown in Table 7-1.

7.2 Investigation Process

Technicians will respond to indications of elevated areas while surveying. Upon detecting an increase in audible response, the technician will reduce the scan speed or pause and attempt to isolate the elevated area. If the elevated activity is verified to exceed the established investigation level, the area should be bounded (marked or flagged and measured to obtain an estimated affected surface area).

Representative direct measurements are obtained as determined by the FSS/Characterization Engineer. The collected data is documented on a Radiological Survey Form.

The size and average activity level in the elevated area is determined to demonstrate compliance with the area factors. If any location in a Class 2 area exceeds the DCGL, scanning coverage in the vicinity is increased in order to determine the extent and level of the elevated reading. If the elevated reading occurs in a Class 3 area, the scanning coverage is increased and the area is re-evaluated for classification.

Table 7-1 Investigation Levels

Classification	Scan Investigation Levels[3]	Direct Investigation Levels
Class 1	>$DCGL_{EMC}$	>$DCGL_{EMC}$
Class 2	>$DCGL_w$ or >MDC_{scan} if MDC_{scan} is greater than $DCGL_w$.	>$DCGL_w$
Class 3	>$DCGL_w$ or >MDC_{scan} if MDC_{scan} is greater than $DCGL_w$.	>0.5 $DCGL_w$

Investigations should consider: (1) the assumptions made in the survey unit classification; (2) the most likely or known cause of the contamination; and (3) the possibility that other areas within the survey unit may have elevated areas of activity that may have gone undetected. Depending on the results of the investigation, a portion of the survey unit may be reclassified if there is sufficient justification. The results of the investigation process are documented in the survey area Release Record. See also section 7.4 for additional discussion regarding potential reclassification of the survey unit.

7.3 Elevated Measurement Comparison (EMC)

The elevated measurement comparison may be used for Class 1 survey units when one or more scan or static measurements exceed the investigation level if remediation is not performed. The EMC provides assurance that unusually large measurements receive the proper attention and that any area having the potential for significant dose contribution is identified. As stated in NUREG-1575 (MARSSIM), the EMC is intended to flag potential failures in the remediation process and should not be considered the primary means to identify whether or not a survey unit meets the release criterion.

Locations identified by scan with levels of residual radioactivity which exceed the $DCGL_{EMC}$ or static measurements with levels of residual radioactivity which exceed the $DCGL_{EMC}$ are subject to additional surveys to determine compliance with the elevated measurement criteria. The size of the area containing the elevated residual radioactivity and the average level of residual activity within the area are determined. The average level of activity is compared to the $DCGL_W$ based on the actual area of elevated activity. (If a background reference area is being applied to the survey unit, the mean of the background reference area activity may be subtracted before conducting the EMC).

[3] Must be calculated *a priori*

The initial $DCGL_{EMC}$ is established during the survey design and is calculated as follows:

$$DCGL_{EMC} = Area\ Factor \times DCGL$$

The area factor is the multiple of the DCGL that is permitted in the area of elevated residual radioactivity without remediation. The area factor is related to the size of the area over which the elevated activity is distributed. That area is generally bordered by levels of residual radioactivity below the DCGL and is determined by the investigation process. The method for calculating the area factors is provided in Attachment B and the resulting area factors are listed in Tables 3-5 and 3-6.

The actual area of elevated activity is determined by investigation surveys and the area factor is adjusted for the actual area of elevated activity. The product of the adjusted area factor and the $DCGL_w$ determines the actual $DCGL_{EMC}$. If the $DCGL_{EMC}$ is exceeded, additional investigations are performed.

The results of the elevated area investigations in a given survey unit that are below the $DCGL_{EMC}$ limit are evaluated using the equation below. If more than one elevated area is identified in a given survey unit, the unity rule can be used to determine compliance. If the equation value is less than unity, no further elevated area testing is required and the EMC test (shown below) is satisfied:

$$\frac{\delta}{DCGL_W} + \frac{(average\ concentration\ in\ elevated\ area - \delta)}{(Area\ Factor)(DCGL_W)} \leq 1.0,$$

Where: δ is the average residual activity in the survey unit.

When calculating δ for use in this inequality, measurements falling within the elevated area may be excluded provided the overall average in the survey unit is less than the $DCGL_w$.[4]

For embedded piping, the number of elevated areas will be limited to ensure that the total inventory remaining in each EP will be maintained at the level that would be present if the entire pipe were contaminated at the DCGL level.

Compliance with the soil $DCGL_{EMC}$ will be determined using the FSS gamma spectroscopy results and a unity rule approach. These general methods will also be applied to other materials where sample gamma spectroscopy is used for FSS. The application of the unity rule to the elevated measurement comparison requires area factors and corresponding $DCGL_{EMC}$ to be calculated for Cs-137, Co-60, and any other gamma emitter identified during FSS, separately.

The methods used to calculate the nuclide specific soil area factors are presented in Attachment B. These area factors are used to determine $DCGL_{EMC}$ for Co-60, Cs-137, and any other identified gamma emitter, for each elevated area being

[4] MARSSIM, NUREG-1575, Revision 1, (June 2001), Section 8.5.2, per the EPA website at www.epa.gov/radiation/marssim/docs/revision1.

evaluated during FSS. The surrogate radionuclides will be conservatively accounted for through the application of the Cs-137 area factor to the surrogate Cs-137 DCGL since the difficult to detect radionuclides have higher area factors than Cs-137. The $DCGL_{EMC}$ are used as follows to determine compliance with the elevated measurement comparison. Background could be subtracted from each radionuclide concentration if necessary:

$$\left(\frac{Cs-137}{Cs-137_{DCGL_{EMC}}}\right)+\left(\frac{Co-60}{Co-60_{DCGL_{EMC}}}\right)+\left(\frac{R_N}{DCGL_{EMC_N}}\right)\leq 1.0$$

Where:

Cs-137 and Co-60 are the gamma spectroscopy results from FSS,

$DCGL_{EMC_N}$ is calculated for the size of the elevated area being evaluated,

R_N is any other gamma emitter identified during FSS, and

$DCGL_{EMC_N}$ is the $DCGL_{EMC}$ for radionuclide N.

7.4 Remediation and Reclassification

As shown in Table 7-2, for any classification (1, 2 or 3), areas of elevated residual activity above the $DCGL_{EMC}$ are remediated to reduce the residual radioactivity to acceptable levels. Whenever an investigation confirms activity above an action level listed in Table 7-2, an evaluation of the historical site assessment, operational history, design information, and sample results will be performed and documented. The evaluation will consider: (1) the elevated area's location, dimensions, and sample results, (2) an explanation as to the potential cause and extent of the elevated area in the survey unit, (3) the recommended extent of reclassification, if considered appropriate, and (4) any other required actions. Areas that are reclassified as Class 1 are typically bounded by a Class 2 buffer zone to provide further assurance that the reclassified area completely bounds the elevated area. This evaluation process is established to avoid the unwarranted reclassification of an entire survey unit (which can be quite large) while at the same time requiring an assessment as to extent and reasons for the elevated area.

If an individual survey measurement (scan, direct or material sample) in a Class 2 survey unit exceeds the DCGL, the survey unit or a portion of it shall be reclassified to a Class 1 and the survey redesigned and re-performed accordingly. If an individual survey measurement in a Class 3 survey unit exceeds 0.5 DCGL, the survey unit, or portion of a survey unit, will be evaluated, and if necessary, reclassified to a Class 2 and the survey redesigned and re-performed accordingly.

Table 7-2 Investigation Actions

Action If Investigation Results Exceed:			
Class	**$DCGL_{EMC}$**	**$DCGL_W$**	**0.5 $DCGL_W$**
1	Remediate and resurvey as necessary	Acceptable	Acceptable
2	Remediate, reclassify portions as necessary	Reclassify portions as necessary	Acceptable
3	Remediate, reclassify portions as necessary	Increase scan coverage and reclassify portions as necessary	Increase scan coverage and reclassify portions as necessary

7.5 Resurvey

Following an investigation, if a survey unit is reclassified or if remediation activities were performed, a resurvey is performed in accordance with approved implementing procedures. If a Class 2 unit had contamination greater than the $DCGL_W$ it should be reclassified. If the average value of Class 2 direct survey measurements was less than the $DCGL_W$, the $Scan_{MDC}$ was sensitive enough to detect the $DCGL_{EMC}$ and there were no areas greater than the $DCGL_{EMC}$, the survey redesign may be limited to obtaining a 100% scan without having to re-perform the direct measurements. This condition assumes that the sample density meets the requirements for a Class 1 area. If the Class 2 area had contamination greater than the $DCGL_W$, but the $Scan_{MDC}$ was not sensitive enough to detect the $DCGL_{EMC}$, the affected area is reclassified and resurveyed at the sample density determined from the EMC.

8.0 DATA COLLECTION AND PROCESSING

8.1 Sample Handling and Record Keeping

A chain-of-custody record accompanies each sample from the point of collection through obtaining the final results to ensure the validity of the sample data. Chain-of-custody records are controlled and maintained and, upon completion of the data cycle, are transferred to Document Control, in accordance with applicable procedures.

Each survey unit will have a document package associated with it which covers the design and field implementation of the survey requirements. Survey unit records are quality records.

8.2 Data Management

Survey data are collected and evaluated from several sources during the data life cycle.

QC measurements are not used as FSS data. See section 11.2 for design and use of QC measurements.

Measurements performed during characterization, turnover and investigation surveys can be used as FSS data if they are performed according to the same requirements as the final survey data. These requirement include: (1) the representativeness of the survey data to reflect the as-left survey unit condition untouched by further remediation; (2) the application of isolation measures to the survey unit to prevent re-contamination and to maintain final configuration; and (3) the data collection and design were in accordance with FSS methods (e.g., scan MDC, investigation levels, survey data point number and location, statistical tests, and EMC tests).

Measurement results stored as FSS data constitute the final survey of record and are included in the data set for each survey unit used for determining compliance with the site release criteria.

Measurements are recorded in units appropriate for comparison to the DCGL. The recording units for surface contamination are dpm/100 cm^2 and pCi/g for activity concentrations. Numerical values, even negative numbers, are recorded.

Document Control procedures establish requirements for record keeping. Measurement records include, at a minimum, the surveyor's name, the location of the measurement, the instrument used, measurement results, the date and time of the measurement and any surveyor comments.

8.3 Data Verification and Validation

The FSS data are reviewed before data assessment to ensure that they are complete, fully documented and technically acceptable. The review criteria for data acceptability will include at a minimum, the following items:

- Compliance with survey instructions as specified in the survey package
- The instrumentation MDC for fixed or volumetric measurements was below the $DCGL_W$ or if not, below the $DCGL_{EMC}$ for Class 1, below the $DCGL_W$ for Class 2 and below 0.5 $DCGL_w$ for Class 3 survey units.
- The instrument calibration was current and traceable to NIST standards.
- The field instruments were source checked with satisfactory results before and after use each day data are collected or if unsatisfactory, data obtained with that instrument since its previous acceptable performance check was evaluated for acceptability.
- The MDCs and assumptions used to develop them were appropriate for the instruments and techniques used to perform the survey.
- The survey methods used to collect data were proper for the types of radiation involved and for the media being surveyed.
- "Special methods" for data collection were properly applied for the survey unit under review. These special methods are either described in this FSSP section or will be the subject of an NRC notice of opportunity for review.
- The chain-of-custody was tracked from the point of sample collection to the point of obtaining results.
- The data set is comprised of qualified measurement results collected in accordance with the survey design, which accurately reflects the radiological status of the facility.
- The data has been properly recorded.

If the data review criteria were not met, the discrepancy will be reviewed and the decision to accept or reject the data will be documented in accordance with approved procedures.

8.4 Graphical Data Review

Survey data may be graphed to identify patterns, relationships or possible anomalies which might not be apparent using other methods of review. A posting plot or a frequency plot may be made. Other special graphical representations of the data will be made as needed.

8.4.1 Posting Plots

Posting plots may be used to identify spatial patterns in the data. The posting plot consists of the survey unit map with the numerical data shown at the location from which it was obtained. Posting plots can reveal patches of elevated radioactivity or local areas in which the DCGL is exceeded. Posting plots can be generated for background reference areas to point out spatial trends that might adversely affect the use of the data. Incongruities in the background data may be the result of residual, undetected activity, or they may just reflect background variability.

8.4.2 Frequency Plots

Frequency plots may be used to examine the general shape of the data distribution. Frequency plots are basically bar charts showing data points within a given range of values. Frequency plots reveal such things as skewness and bimodality (having two peaks). Skewness may be the result of a few areas of elevated activity. Multiple peaks in the data may indicate the presence of isolated areas of residual radioactivity or background variability due to soil types or differing materials of construction. Variability may also indicate the need to more carefully match background reference areas to survey units or to subdivide the survey unit by material or soil type.

9.0 DATA ASSESSMENT AND COMPLIANCE

An assessment is performed on the FSS data to ensure that they are adequate to support the determination to release the survey unit. Simple assessment methods such as comparing the survey data to the DCGL or comparing the mean value to the DCGL are first performed. The statistical tests are then applied to the final data set and conclusions are made as to whether the survey unit meets the site release criterion.

9.1 Data Assessment Including Statistical Analysis

The results of the survey measurements are evaluated to determine whether the survey unit meets the release criterion. In some cases, the determination can be made without performing complex, statistical analyses.

9.1.1 Interpretation of Sample Measurement Results

An assessment of the measurement results is used to quickly determine whether the survey unit passes or fails the release criterion or whether one of the statistical analyses must be performed. The evaluation matrices are presented in Tables 9-1 and 9-2.

Table 9-1 Interpretation of Sample Measurements When the WRS Test Is Used

Measurement Results	Conclusion
Difference between maximum survey unit concentration and minimum reference area concentration is less than the DCGLw	Survey unit meets release criterion.
Difference of survey unit average concentration and reference average concentrations greater than the DCGLw	Survey unit fails.
Difference between any survey unit concentration and any reference area concentration is greater than the DCGLw and the difference of survey unit average concentration and reference area average concentration is less than the DCGLw	Conduct WRS test and elevated measurements test.

Table 9-2 Interpretation of Sample Measurements When the Sign Test is Used

Measurement Results	Conclusion
All concentrations less than the DCGLw	Survey unit meets release criterion
Average concentration greater than the DCGLw	Survey unit fails
Any concentration greater than the DCGLw and average concentration less than the DCGLw	Conduct Sign Test and elevated measurements test.

When required, one of four statistical tests will be performed on the survey data:

- WRS Test
- Sign Test
- WRS Test Unity Rule
- Sign Test Unity Rule

In addition, survey data are evaluated against the EMC criteria as previously described in section 7.3 and as required by NUREG 1727. The statistical test is based on the null hypothesis (H_0) that the residual radioactivity in the survey unit exceeds the DCGL. There must be sufficient survey data at or below the DCGL to reject the null hypothesis and conclude the survey unit meets the site release criterion for dose. Statistical analyses may be performed using a computer software program or, if necessary, using hand calculations.

9.1.2 Wilcoxon Rank Sum Test

The WRS test, or WRS Unity Rule (NUREG-1505, Chapter 11), may be used when the radionuclide of concern is present in the background or measurements are used that are not radionuclide-specific. In addition, this test is valid only when "less than" measurement results do not exceed 40 percent of the data set.

The WRS test is applied as follows:

1. The background reference area measurements are adjusted by adding the $DCGL_W$ to each background reference area measurement,

   $X_i,\ Z_i = X_i + DCGL.$

2. The number of adjusted background reference area measurements, m,

and the number of survey unit measurements, n, are summed to obtain N, (N = m + n).

3. The measurements are pooled and ranked in order of increasing size from 1 to N. If several measurements have the same value, they are assigned the average rank of that group of measurements.
4. The ranks of the adjusted background reference area measurements are summed to obtain W_r.
5. The value of W_r is compared with the critical value in Table I.4 of NUREG-1575 (MARSSIM). If W_r is greater than the critical value, the survey unit meets the site release dose criterion. If W_r is less than or equal to the critical value, the survey unit fails to meet the criterion.

9.1.3 Sign Test

The Sign test and Sign test Unity Rule are one-sample statistical tests used for situations in which the radionuclide of concern is not present in background, or is present at acceptable low fractions compared to the $DCGL_W$. If present in background, the gross measurement is assumed to be entirely from plant activities. This option is used when it can be reasonably expected that including the background concentration will not affect the outcome of the Sign test. The advantage of using the Sign test is that a background reference area is not needed. The Sign Test may also be applied to net values after material and/or ambient background subtraction The Sign test is conducted as follows:

1. The survey unit measurements, X_i, i = 1, 2, 3, ...N; where N = the number of measurements, are listed.
2. X_i is subtracted from the $DCGL_W$ to obtain the difference $D_i = DCGL_W - X_i$, i = 1, 2, 3,..., N.
3. Differences where the value is exactly zero are discarded and N is reduced by the number of such zero measurements.
4. The number of positive differences are counted. The result is the test statistic S+. Note that a positive difference corresponds to a measurement below the $DCGL_W$ and contributes evidence that the survey unit meets the site release criterion.
5. The value of S+ is compared to the critical value given in Table I.3 of NUREG-1575 (MARSSIM). The table contains critical values for given values of N and α. The value of α is set at 0.05 during survey design. If S+ is greater than the critical value given in the table, the survey unit meets the site release criterion. If S+ is less than or equal to the critical value, the survey unit fails to meet the release criterion.

9.1.4 Unity Rule

The Cs-137 to Co-60 ratio will vary in the final survey soil samples, and this will be accounted for using a "unity rule" approach as described in NUREG-1505 Chapter 11. Unity Rule equivalents will be calculated for each measurement result using the surrogate adjusted Cs-137 DCGL and the adjusted Co-60 DCGL, as shown in the following equation:

$$C_1/DCGL_1 + C_2/DCGL_2 + ... C_n/DCGL_n \leq 1$$

Where:

C_n = concentration of radionuclide n and

$DCGL_n$ = DCGL of radionuclide n

The unity rule equivalent results will be used to demonstrate compliance assuming the DCGL is equal to 1.0 using the criteria listed in Tables 9-1 and 9-2. If the application of the WRS or Sign test is necessary, these tests will be applied using the unity rule equivalent results and assuming that the DCGL is equal to 1.0.

An example of a WRS test using the unity rule is provided in NUREG-1505, Page 11-3, Section 11.4. If the WRS test is used, or background subtraction is used in conjunction with the Sign test, background concentrations will also be converted to Unity Rule Equivalents prior to performing this test.

The Sign test will be used without background subtraction if background Cs-137 is not considered a significant fraction of the DCGL. Note that the surrogate Cs-137 DCGL will be used for both the statistical tests and comparisons with the criteria in Tables 9-1 and 9-2.

The same general surrogate and unity rule methods described above for soil can be applied to other materials if sample gamma spectroscopy is used for final survey as opposed to gross beta measurements.

9.2 Data Conclusions

The results of the statistical tests, including application of the EMC, allow one of two conclusions. The first conclusion is that the survey unit meets the unrestricted use criterion. The data provides statistically significant evidence that the level of residual radioactivity in the survey unit does not exceed the release criterion. The decision to release the survey unit is made with sufficient confidence and without further analysis.

The second conclusion that can be made is that the survey unit fails to meet the release criterion. The data are not conclusive in showing that the residual radioactivity is less than the release criterion. The data are analyzed further to determine the reason for the failure.

Possible reasons are that:

1. the average residual radioactivity exceeds the DCGL, or
2. the test did not have sufficient power to reject the null hypothesis (i.e., the result is due to random statistical fluctuation).

The power of the statistical test is a function of the number of measurements made and the standard deviation in measurement data. The power is determined from $1-\beta$ where β is the value for Type II errors. A retrospective power analysis may be performed using the methods described in Appendices I.9 and I.10 of NUREG-1575 (MARSSIM). A greater number of measurements increases the probability of passing if the survey unit actually meets the release criterion. If failure was due to the presence of residual radioactivity in excess of the release criterion, the survey unit must be remediated and resurveyed.

9.3 Compliance

The FSS is designed to demonstrate that licensed radioactive materials have been removed from PBRF facilities and property to the extent that residual levels of radioactive contamination are below the radiological criteria for unrestricted use as approved by the NRC. The site-specific radiological criteria presented in this plan demonstrate compliance with the criteria of 10 CFR 20.1402.

If the measurement results pass the requirements of Tables 9-1 and 9-2 of section 9.1.1, and the elevated areas evaluated per section 7.3 pass the elevated measurement comparison, then the survey unit is suitable for unrestricted release.

10.0 REPORTING FORMAT

Survey results are documented in history files, survey unit release records, and in the FSSR. Other reports may be generated as requested by the NRC.

10.1 History File

A history file of relevant operational and decommissioning data should be compiled. The history file should consist of relevant historical site assessment information, Characterization Survey data and the classification basis. The purpose of the history file is to provide a substantive basis for the survey unit classification, and hence, the level of intensity of the FSS.

10.2 Survey Unit Release Record

A separate release record is prepared for each survey unit. The survey unit release record is a stand-alone document containing the information necessary to demonstrate compliance with the site release criteria. This record includes:

1. Description of the survey unit
2. Survey unit design information
3. Survey unit measurement locations and corresponding data
4. Survey unit investigations performed and their results
5. Survey unit data assessment results
6. Documentation of evaluations pertaining to compliance with the unrestricted use limit of 25 mrem/yr and dose contributions from EP and radionuclides contributing 10% in aggregate of the total dose for both structural scenarios and soils.
7. Results of direct dose calculations pertaining to continuous columns of contaminated soil from grade to depths greater than 6 inches in accordance with section 3.2

A check-list may be employed as part of the implementing procedure to ensure all required information and evaluations are contained within each survey unit release record. When a survey unit release record is given final approval, it becomes a quality record.

10.3 Final Status Survey Report

FSS results will be described in a written report to the NRC. The actual structures, land, or system included in each written report may vary depending on the status of ongoing decommissioning activities.

The FSS report provides a summary of the survey results and the overall conclusions, which demonstrate that the PBRF facility and site meet the radiological criteria for unrestricted use. Information such as the number and type of measurements, basic statistical quantities, and statistical analysis results

are included in the report. The level of detail is sufficient to clearly describe the FSS program and to certify the results. The format of the final report will contain the following topics:

1. Overview of the Results
2. Discussion of Changes to FSS
3. FSS Methodology
   a. Survey unit sample size
   b. Justification for sample size
4. FSS Results
   a. Number of measurements taken
   b. Survey maps
   c. Sample concentrations
   d. Statistical evaluations, including power curves
   e. Judgmental and miscellaneous data sets
5. Anomalous Data
6. Conclusion for each survey unit
7. Any changes from initial assumptions on extent of residual activity.
8. Simplified General Retrospective Dose Estimate: For illustrative purposes, relevant FSS data will be reviewed to determine a gross average of residual contamination level which will be used to calculate a retrospective dose estimate. This retrospective dose estimate will be provided in the final report.

10.4 Other Reports

Other reports will be prepared and submitted as requested.

11.0 FSS QUALITY CONTROL (QC)

The objective of QC implementation is to ensure that the survey data collected are of the type and quality required to demonstrate that the dose from residual contamination is below the 25 mrem/yr unrestricted use criteria and to support a decision to terminate the PBRF license. QC ensures that: 1) the elements of the FSS plan are implemented in accordance with the approved procedures; 2) surveys are conducted by trained personnel using calibrated instrumentation; 3) the quality of the data collected is adequate; 4) all phases of survey package design and implementation are properly reviewed, and oversight is provided; and 5) corrective actions, when identified, are implemented in a timely manner and are determined to be effective. FSS QC includes the following aspects of FSS activities.

11.1 Project Management and Organization

NASA's Glenn Research Center (GRC) is responsible for overall execution of the PBRF Decommissioning Project and for public health and safety. As licensee, GRC provides oversight of the decommissioning effort and has established a Federal Sector Team comprised of GRC, Argonne National Laboratory (ANL), and the USACE to execute decommissioning of the PBRF. GRC is responsible for licensing activities, safety, and interfaces directly with the U.S. NRC and the public. ANL provides technical support to GRC in the areas of health physics and environmental safety and health. USACE is responsible for safety, engineering and design quality assurance, construction management, radiological, environmental and waste management, and financial management of the Total Environmental Restoration Contract (TERC). A combination of the various groups described above comprises the PBRF decommissioning organization, or "PBRF" as it is used in this document. Complete details regarding roles and responsibilities of the Federal Sector Team is provided in Section 2.0 of the Decommissioning Plan.

The decommissioning team will provide the necessary personnel, materials, and subcontractors to perform all phases of Decontamination Remediation work including performance of the FSS. Figure 11-1 illustrates the functional FSS organizational chart. Trained and experienced personnel will perform the FSS in accordance with the protocols and process presented in this Plan, using written survey instructions and approved procedures.

Specific members that are directly involved with the FSS:

11.1.1 Project Manager (PM)

The PM is responsible for executing the project in accordance with site plans and procedures.

11.1.2 QC Manager

The QC Manager is responsible for the review, approval, distribution, and implementation of the project Quality Control Plan, all Quality Assurance Project Plans and all supporting documents that are subject to controlled distribution requirements. The QC Manager is responsible for participation in internal planning, technical review, and change control processes, and for verification of facility and site QC implementation through the auditing and surveillance processes. The QC Manager reports to the Project Manager

11.1.3 FSS/Characterization Manager

The FSS/Characterization Manager is responsible for the organization, administration, development, and implementation of the FSS program under the FSS Plan. The FSS/Characterization Manager is responsible for ensuring activities conducted as part of the FSS is performed in accordance with the FSS Quality Assurance Plan. The FSS/Characterization Manager is responsible for management of personnel assigned to the FSS section. The FSS/Characterization Manager is responsible for approving FSS Release Records and ensuring contractual and licensing obligations are satisfied. The FSS/Characterization Manager reports to the PM. An additional responsibility is to appropriately include elements defined in the FSS Plan into FSS Procedures so that adherence to the project procedures will assure compliance to this FSS Plan.

11.1.4 FSS/Characterization Engineers

The FSS/Characterization Engineers are responsible for providing survey instructions to, and receiving completed surveys from the FSS Team. The FSS/Characterization Engineers are responsible for the technical direction, development and implementation of FSS Survey. The FSS/Characterization Engineers are also responsible for preparing survey designs and schedules, preparing and maintaining FSS Packages, supervising data collection, supporting data evaluation, resolving and documenting any survey design, instruction or performance discrepancies.

11.1.5 FSS/Characterization Supervisors

The FSS/Characterization Supervisors are responsible for control and implementation of survey packages as received from the FSS/Characterization Engineers, for coordination of turnover surveys, final status surveys, survey area preparation (such as gridding and accessibility needs), for maintaining access controls over completed FSS survey areas, for coordination and scheduling of FSS/Characterization Technicians to support the FSS schedule and ensuring all necessary instrumentation and other equipment is available to support survey activities. The FSS/Characterization Supervisors report to the FSS/Characterization Manager.

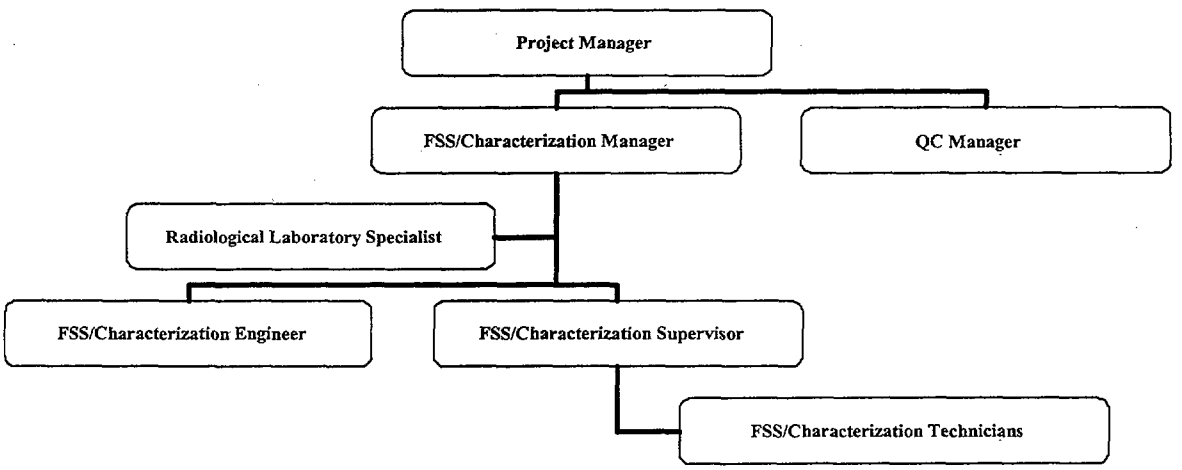
11.1.6 Radiological Laboratory Specialist

The Radiological Laboratory Specialist will perform radiological sample analysis of volumetric material samples for FSS. The Radiological Laboratory Specialist will operate instrumentation in accordance with approved procedures and manufacturers' recommendations, ensuring instrument QC and MDC requirements are met. During the FFS, The Radiological Laboratory Specialist will report to the FSS/Characterization Manager and provide direction and support for the project sampling activities, including sample collection, handling, storage, preservation, and shipment. Additionally, the Radiological Laboratory Specialist will interface with the QC Manager for direction and support on analytical issues.

11.1.7 FSS/Characterization Technicians

The FSS/Characterization Technicians are responsible for understanding the requirements included in the FSS Plan and the FSS Procedures. The FSS/Characterization Technicians are responsible for performing work according to the FSS Procedures. Through compliance with those procedures, FSS/Characterization Technicians should implement the requirements contained in this FSS Plan to assure appropriate quality is used in the collection of data for FSS decision making.

Figure 11-1 FSS Functional Organization Chart



11.1.8 Project Description and Schedule

Each area of the site will be divided into survey units and classified as directed by procedure. The survey measurements for each survey unit will be determined during the survey design phase. Portions of the FSS will be performed during decommissioning activities as areas become available for survey.

11.2 Quality Objectives and Measurement Criteria

11.2.1 Training and Qualification

The PBRF Decommissioning Plan Section 2.5, "Training Program," provides detailed descriptions of the training requirements for the PBRF decommissioning. These training requirements are a prerequisite for all project personnel performing work during the PBRF decommissioning. As stated in the Decommissioning Plan, all personnel assigned to work at the PBRF will meet the NASA training and certification requirements and any other applicable regulatory requirements. NASA employees and contractors will receive training on the Decommissioning Plan. More specific training for workers will be commensurate with their duties and responsibilities and the magnitude of the potential exposure to specific hazards.

Specific training to this FSSP will be provided to personnel who are performing surveys, collecting samples and/or handling radioactive materials in radiological areas. The training ensures that FSS personnel have sufficient knowledge to perform work activities in accordance with the requirements of this FSSP and the PBRF Decommissioning Plan. The site FSS staff will also receive training developed in support of this FSSP. At a minimum, personnel assigned to acquire FSS survey data in accordance with this plan will be trained on the following:

- Initial set-up and pre-use response checks with a data-logger instrument and associated detectors.
- Proficiency with operating a data-logger instrument and associated detectors.
- Download survey data from a data-logger instrument.
- Performance of TSC measurements.
- Performance of scanning of structural surfaces and open land areas.
- Performance of volumetric material sampling.

11.2.2 Survey Documentation

Each FSS measurement will be identified by date, instrument, location, type of measurement, and mode of operation. Generation, handling and storage of the original FSS design and data packages will be controlled. The FSS records have been designated as quality documents and, as such, they will be maintained in accordance with Document Control procedures.

11.2.3 Quality Control Measures

The overall quality control (QC) objective for the FSSP is to collect and analyze data to demonstrate compliance with the unrestricted release criteria specified in 10 CFR 20.1402 to the satisfaction of the US Nuclear Regulatory Commission. Satisfaction of this objective should allow for the termination of the radioactive materials licenses for this facility.

Replicate surveys and duplicate samples will be collected as quality control samples to assess survey precision, and sample control during transport.

11.2.3.1 Replicate Direct Field Measurements

Replicate Direct Field Measurements will be used to monitor sampling precision in the field. A minimum 5% of survey measurements will be selected for performance of replicate static surveys. These should generally include areas from Class 1, Class 2, and Class 3 areas. The FSS/Characterization Engineer will randomly identify a minimum of 5% of the survey measurements for replicate direct field measurements. Qualitative results from replicate scans will be included in FSS Report.

11.2.3.2 Duplicate Soil Sample Analyses

A minimum of one of every twenty soil samples will be fully homogenized, split and submitted for independent analysis. QC duplicate samples will typically be analyzed by the on-site laboratory, however, an independent, USACE-validated, off-site laboratory may be used for QC duplicate sample analysis at the discretion of the FSS/Characterization Manager.

11.2.3.3 Compliance with Acceptance Criteria

Acceptance criteria for replicate (or duplicate) measurements and the equations to be used for assessing precision can be found in Section 11.2.4. Precision for duplicate direct static measurements and sample analyses will be assessed through the calculation of relative percent difference (RPD).

If QC replicate measurements or sample analyses fall outside of their acceptance criteria, a documented investigation will be performed in accordance with approved procedures; and if necessary, the Corrective Action Process described in section 11.2.6.2 will be implemented. The investigation will typically involve verification that the proper data sets

were compared, the relevant instruments were operating properly and the survey/sample points were properly identified and located. Relevant personnel are interviewed, as appropriate, to determine if proper instructions and procedures were followed and proper measurement and handling techniques were used including chain of custody, where applicable. When deemed appropriate, additional measurements are taken. Following the investigation, a documented determination is made regarding the usability of the survey data and if the impact of the discrepancy adversely affects the decision on the radiological status of the survey unit.

11.2.4 Precision, Accuracy and Completeness Assessments

Analytical data are generated for replicate surveys and duplicate samples to determine precision and accuracy of the analytical method and sample preparation.

11.2.4.1 Relative Percent Difference, RPD (defined in SW-846)

The Relative Percent Difference may be used to assess precision related to the acquisition and comparison of replicate and duplicate analyses or measurements if required as a part of data evaluation.

The relative percent difference, RPD, between duplicate determinations is calculated as follows:

$$RPD = \frac{|(D_1 - D_2)|}{(D_1 + D_2)/2} x\ 100 \ ,$$

where; RPD =Relative Percent Difference

D_1 = 1st data result, and

D_2 = 2nd data result.

11.2.4.2 Application of NRC Inspection Procedure 84750

The NRC Inspection Procedure 84750 (IP 84750) will be used to determine the acceptability of QC Replicate and Duplicate laboratory sample analyses and direct survey measurements. The IP 84750 critera are applicable when the sample analyzed is either a single sample analyzed on two different systems, when a split sample is analyzed on one system, and when replicate direct survey measurements are performed. Table 11-1 lists the IP 84750 acceptance criteria.

In addition, duplicate QC measurements are satisfactory if the QC data supports the same conclusion pertaining to the compliance of the survey unit with the release criteria as indicated by the original measurements.

Table 11-1 NRC Criteria for Accepting Sample Measurements

Resolution	Acceptable Ratio
<4	0.4-2.5
4-7	0.5-2.0
8-15	0.6-1.66
16-50	0.75-1.33
51-200	0.80-1.25
>200	0.85-1.18

Actions to determine the source of deviation for measurements not in agreement are:

- Review calculations,
- Review sample geometries and
- Consider ways the radioanalytical method or measurement may contribute to disagreement.

11.2.5 Measurement/Data Acquisition

11.2.5.1 Survey Design and Sampling Methods

The site will be divided into survey areas. A survey package may be developed for each survey area, which may contain one or more survey units, or a survey package may be developed for each survey unit (at the discretion of PBRF). Each survey package will specify the type and number of measurements required based on the classification of each survey unit.

11.2.5.2 Written Procedures

The FSS of the PBRF will be conducted in accordance with written, approved procedures that ensure quality and minimize risk to workers, the public and the environment. Approved procedures will describe the methods and techniques used for the FSS measurements. Procedures will be controlled and implemented to ensure that operations are performed in a consistent, safe, and technically correct manner.

Specific procedures for the following functions will be prepared to further define FSS activities. These procedures are separated into 3 functional groups covering FSS Implementation, Instrument Calibration and Operation, and Sample Preparation. This list includes the currently required procedures, but procedures may be added or removed, as appropriate.

FSS Implementation (100 Series)

- PBRF-CS-100, FSS Quality Control
- PBRF-CS-101, FSS Sample Identification and Chain of Custody
- PBRF-CS-102, FSS Survey Area Classification
- PBRF-CS-103, FSS Survey Area Turnover and Control
- PBRF-CS-104, FSS Survey Data Download
- PBRF-CS-105, FSS Survey Data Processing and Reporting
- PBRF-CS-106, FSS Survey Package Design, Implementation and Closure
- PBRF-CS-107, FSS of Systems, Soils and Structures
- PBRF-CS-108, Data Quality Management Guidelines for Off-Site Laboratories

FSS Instrument Operation and Calibration

- PBRF-RP-034, Operation and Calibration of the Eppendorf Pipets
- PBRF-RP-035, Operation and Calibration of the Fisher Accu-224 Analytical Balance
- PBRF- RP-036, Operation and Calibration of Ohaus Scout II Electronic Balance
- PBRF- RP-044, Operation and Calibration of Ohaus Navigator Balance
- PBRF- RP-015, Measurement of Gross Alpha and Beta Particles (Protean IPC 9025)
- PBRF- RP-056, Measurement of Gross Alpha and Beta Particles (Canberra S5XLB)
- PBRF- RP-001, Calibration of the ORTEC HPGe Gamma Spectroscopy System
- PBRF- RP-021, Operation of the ORTEC HPGe Gamma Spectroscopy System
- PBRF- RP-020, Operation and Calibration of the Packard Model 2900 TR Liquid Scintillation Analyzer
- PBRF-CS-007, Issue, Control and Accountability of FSS Instrumentation
- PBRF-CS-011, Operation of Ludlum Model 2350 Data Logger Survey Instrument

FSS Sample Preparation

- PBRF- RP-052, Processing FSS Samples for Off-Site Analysis
- PBRF- RP-032, Sample Preparation for Gamma Spectral Analysis
- PBRF- RP-033, Sample Preparation for Tritium Analysis

11.2.5.3 Chain-of-Custody

Responsibility for custody of samples from the point of collection through the determination of the final survey results is established by implementing procedures for FSS Sample Identification and Chain-of-Custody that will ensure that Chain-of-Custody is maintained and the validity and control of material samples are intact.

The person that acquired the sample is responsible for the care and custody of the samples until they are transferred or properly dispatched. As few people as possible should handle the samples.

Sample containers will be labeled with sample numbers (in accordance with Survey Data Management System (SDMS) as specified in Table 5-2) and the date and time of collection.

Samples will be accompanied by a properly completed chain-of-custody (CoC) form. The sample numbers and locations will be listed on the CoC form. When transferring the possession of samples, the individuals relinquishing and receiving will sign, date, and note the time on the CoC form. The CoC form documents transfer of custody of samples from the sampler to another person, to a mobile laboratory, to the permanent laboratory, or to/from a secure storage area. Secure storage will be provided for archived samples.

Samples sent to an off-site laboratory will be properly packaged for shipment, with a signed CoC form enclosed in each sample box or cooler. Shipping containers will be secured with strapping tape and custody seals for shipment to the laboratory. The original CoC form will accompany the shipment, and the sampler will retain a copy for the FSS office files. Commercial carriers are not required to sign off on the custody form as long as the CoC forms are sealed inside the sample cooler and the custody seals remain intact.

11.2.5.4 Instrumentation Selection, Calibration and Operation

Instruments selected for the PBRF final status survey will be capable of achieving measurement sensitivities (MDCs) specified in section 6.2.1. Instrument calibration will be performed with NIST traceable sources using approved procedures. Issuance, control and operation of the survey instruments will be conducted in accordance with approved implementing procedures.

11.2.5.5 Control of Consumables

In order to ensure the quality of data obtained from FSS surveys and samples, new sample containers will be used for each sample taken. Tools used to collect samples will be cleaned to remove visible materials and decontaminated as necessary.

11.2.5.6 Control of Vendor-Supplied Services

Vendor-supplied services, such as instrument calibration and laboratory sample analysis, will be procured from appropriate vendors in accordance with approved quality and procurement procedures.

11.2.5.7 Database Control

Software used for data reduction, storage or evaluation will be fully documented and certified by the vendor. The software will be tested prior to use by an appropriate test data set. Programs developed to assist in calculating FSS data (i.e. Excel spreadsheets) shall also be tested to verify they are correct.

11.2.5.8 Data Management

Survey data control from the time of collection through evaluation is specified by procedure. Manual data entries will be verified by a second individual.

11.2.6 Assessment and Oversight

11.2.6.1 Assessments

FSS self-assessments will be conducted in accordance with approved procedures. The findings will be tracked and trended in accordance with these procedures.

11.2.6.2 Corrective Action Process

The corrective action process, already established as part of MW-PL-02-008, Quality Control Plan, section 6.5, will be applied to FSS for the documentation, evaluation, and implementation of corrective actions. The process will be conducted in accordance with approved procedures which describe the methods used to initiate Condition Reports (CRs) and resolve self assessment and corrective action issues related to FSS.

11.2.6.3 Reports to Management

Reports of audits and trend data will be reported to management in accordance with approved procedure.

11.2.7 Data Validation

Survey data will be reviewed by FSS/Characterization staff prior to evaluation or analysis for completeness and for the presence of outliers. Comparisons to investigation levels will be made and measurements exceeding the investigation levels will be evaluated. Procedurally verified

data will be subjected to the Sign test, the Wilcoxon Rank Sum (WRS) test, or WRS Unity test as appropriate. Technical evaluations or calculations used to support the development of DCGL will be independently verified to ensure correctness of the method and the quality of data.

11.2.8 NRC Confirmatory Measurements

PBRF anticipates that both the NRC and OEPA may choose to conduct confirmatory measurements in accordance with applicable laws and regulations. The NRC may take confirmatory measurements to make a determination that the final radiation survey and associated documentation demonstrate that the facility and site are suitable for release in accordance with the criteria for decommissioning in 10 CFR Part 20, subpart E. Timely and frequent communications with these agencies will ensure that they are afforded sufficient opportunity for these confirmatory measurements prior to PBRF implementing any irreversible decommissioning actions that have an impact on FSS (e.g. backfilling open excavations, etc.)

11.3 Access Control Measures

11.3.1 Turnover

Due to the large scope of the FSS and the need for some activities to be performed in parallel with dismantlement activities, a systematic approach to turnover of areas will be established. The implementation of specific protocols pertaining to the turnover and control of FSS areas will be established in an approved implementing procedure. Prior to acceptance of a survey unit for FSS, the following conditions must be satisfied, unless authorized by the FSS/Characterization Manager in accordance with established procedures. These include:

- Decommissioning activities having the potential to contaminate the survey unit must be complete.
- Tools and equipment not required for the survey must be removed, and housekeeping and cleanup must be complete.
- Decontamination activities in the area must be complete.
- Final operational radiological surveys must be complete in impacted areas to ensure that no additional remediation is necessary. (However, some impacted areas may not receive turnover surveys if no remediation was required) These surveys may consist of:
    1. Scan surveys or fixed measurements to ensure that surface contamination is within the FSS total surface contamination limits.
    2. Smear surveys to ensure that the removable surface contamination is within the FSS removable surface contamination limits (i.e.,

10% of the surface contamination limit).

3. Volumetric samples or scans to ensure soil remediation is within acceptable FSS concentration limits.

- Access control or other measures to prevent recontamination must be implemented.
- Turnover surveys may be performed and documented to the same standards as FSS surveys so that data can be used for FSS.

11.3.2 Isolation and Control Measures

Since decommissioning activities may not be completed prior to the start of the FSS, measures will be implemented to protect survey areas from contamination during and subsequent to the FSS. Decommissioning activities creating a potential for the spread of contamination will be completed within each survey unit prior to the FSS. Additionally, decommissioning activities which create a potential for the spread of contamination to adjacent areas will be evaluated and controlled.

Upon commencement of the FSS in areas where there is a potential for re-contamination, implementation of one or more of the following control measures will be required:

- Personnel training
- Installation of barriers to control access to surveyed areas
- Installation of barriers to prevent the migration of contamination from adjacent overhead areas
- Installation of postings requiring contamination monitoring prior to surveyed area access
- Locking entrances to surveyed areas of the facility
- Installation of tamper-evident labels

Routine contamination surveys will be performed in areas following FSS completion to monitor for indications of re-contamination and to verify postings and access control measures. Survey frequency will be based on the potential for re-contamination as determined by the FSS/Characterization Manager. Routine contamination control surveys will not be required for open land areas and structures that are not normally occupied and are unlikely to be impacted by decommissioning activities.

Routine surveys of areas where FSS has been completed will normally include survey locations at floor level and on lower walls. Locations will be selected on a judgmental basis, based on technician experience and conditions present in the survey area at the time of the survey, but are primarily designed to detect the migration of contamination from

decommissioning activities taking place in adjacent and other areas in close proximity which could cause a potential change in conditions.

12.0 REFERENCES

12.1 Appendix A Technical Specifications for the License No. TR-3, National Aeronautics and Space Administration Plum Brook Station, Sandusky, Ohio, Docket No. 50-30, 1998.

12.2 NUREG-1575, "Multi-Agency Radiation Survey and Site Investigation Manual" (MARSSIM), Revision 1 (June 2001).

12.3 Title 10 Code of Federal Regulations, Part 20.1402, "Radiological Criteria for Unrestricted Use".

12.4 Title 10 Code of Federal Regulations, Part 20, Subpart E, "Radiological Criteria for License Termination".

12.5 NUREG-1727, "NMSS Decommissioning Standard Review Plan," September 15, 2000.

12.6 NUREG-1757, "Consolidated NMSS Decommissioning Guidance", September 2003.

12.7 ANL/EAD/TM-89 "Probabilistic dose analysis using parameter distributions developed for RESRAD and RESRAD-BUILD codes", Argonne National Laboratory, 2000.

12.8 ANL/EAD/TM-98 "Development of probabilistic RESRAD 6.0 and RESRAD-BUILD 3.0 computer codes", Argonne National Laboratory, 2000.

12.9 "Decommissioning Plan for the Plum Brook Reactor", Revision 2, October 2001.

12.10 Title 10 Code of Federal Regulations, Part 50.82, "Termination of License".

12.11 Draft Regulatory Guide DG-4006, "Demonstrating Compliance with the Radiological Criteria for License Termination".

12.12 NUREG-1505, "A Nonparametric Statistical Methodology for the Design and Analysis of Final Status Decommissioning Surveys," Rev.1, June 1998 draft.

12.13 Tetra Tech, Inc., "Final Environmental Baseline Survey Report for the Plum Brook Reactor Facility Decommissioning Project", February 2001.

12.14 Teledyne Isotopes, "An Evaluation of the Plum Brook Reactor Facility and Documentation of Existing Conditions, Volume 3: Physical Characterization of Radioactive/Contaminated Areas of the PBRF," December 1987.

12.15 MW-PL-02-004, PBRF Characterization Plan.

12.16 NUREG/CR-5512, "Residual Radioactive Contamination from Decommissioning, Vol. 1".

12.17 NUREG-1549, "Using Decision Methods for Dose Assessment to Comply with Radiological Criteria for License Termination," July 1998 draft.

12.18 Title 10 Code of Federal Regulations, Part 61 "Licensing Requirements for Land Disposal of Radioactive Waste".

12.19 PBRF-CS-016, "Material Background Determination".

12.20 ISO 7503-1, "International Standard, Evaluation of Surface Contamination".

12.21 MW-PL-02-008, "Team Quality Control Plan".

12.22 "Plans of Buildings and Structures, Lewis Research Center, Plum Brook Station, Sandusky, OH", June 1974.

12.23 EPA/SW-846, Test Methods for Evaluating Solid Waste, Volume 1A: Laboratory Manual Physical/Chemical Methods, 1986 updated 1992.

12.24 United States Nuclear Regulatory Commission Inspection Manual, Inspection Procedure 84750.

Final Status Survey Plan
for the
Plum Brook Reactor Facility

Attachment A

Radionuclide Distribution Basis for DCGL Determination, and Final Status Survey of the Plum Brook Reactor Facility (PBRF)

1.0 Purpose

The following attachment to the Final Status Survey Plan (FSSP) for the NASA Plum Brook Reactor Facility (PBRF) establishes the basis for the radionuclide distribution(s) that will be used during the adjusted gross DCGL determination and Final Status Survey. The nuclide distribution addressed in this attachment is not applicable to radioactive waste characterization. Additionally, the current decommissioning strategy for PBRF calls for the removal of activated portions of the concrete bioshield and disposition of the activated concrete as radioactive waste. Therefore, the activated concrete was not evaluated.

2.0 References

2.1 Plum Brook Reactor Facility Decommissioning Plan
2.2 NUREG-1575, Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)
2.3 NUREG/CR-3474, "Long-Lived Activation Products in Reactor Materials"
2.4 NUREG/CR-0130, "Technology, Safety and Cost of Decommissioning"
2.5 NUREG/CR-4289, "Residual Radionuclide Contamination Within and Around Commercial Nuclear Power Plants"
2.6 NUREG-1757, Vol. 2, "Characterization, Survey, and Determination of Radiological Criteria"
2.7 PBRF-TBD-04-006, "Approach and Basis for Development of Site-Specific Derived Concentration Guideline Levels (DCGL)"
2.8 "An Evaluation of the Plum Brook Reactor Facility and Documentation of Existing Conditions," Teledyne Isotopes, December, 1987

3.0 Assumptions

3.1 The samples were representative of the areas in which they were taken.
3.2 Nuclides positively identified in a single sample were assumed to be present at their stated MDA values in all other samples in their applicable populations where the nuclides were not detected.
3.3 RESRAD and RESRAD-BUILD input values used to evaluate dose contributions from specific radionuclides employ the building reuse, subsurface structure and surface soil parameters and scenarios used for site-specific DCGL development that are documented in section 3.1 of the FSSP and in Attachment B.

4.0 Discussion

One of the purposes of Site Characterization is to establish the radionuclide profiles for the various contaminated media for the purposes of dose assessment, DCGL development, and Final Status Survey (FSS) planning. Another one of the objectives of characterization surveys and historical site assessments is to provide the information needed to select the radionuclide distribution(s).

The evaluation provided in this attachment was performed to identify the suite of radionuclides that could potentially be present in site structures and soils following completion of decommissioning activities and structure demolition. Calculations in this document used radionuclide concentrations observed in smear samples from a 10 CFR Part 61 waste stream characterization analyses as well as the results of the isotopic analysis of concrete core samples collected as part of the characterization survey.

A variety of concrete structures containing residual contamination will remain after decommissioning including the walls and floors of the basements of major buildings as well as concrete demolition debris that will be used as clean fill. At PBRF, the two major sources for the radioactive contamination of the concrete were the reactor coolant water, which contained both fission and activation products, and the irradiation of experiments. The presence of low levels of fission products in some of the sample results suggests that a small clad failure or a recycling of treated water from the Hot Laboratory may have occurred.

In order to assess the possibility that more than one radionuclide distribution could apply to the concrete structures and post demolition concrete debris that will undergo FSS, both the operational history and uses of the different structures were evaluated.

4.1 Historical Overview

The PBRF was used to perform nuclear irradiation testing of fueled and unfueled experiments for space program applications. Construction of the PBRF began in 1956. Preoperational testing of the reactor was performed during 1961 and 1962 and full power operations began in April 1963. The 60 MW reactor was operated by NASA on an essentially uninterrupted basis for almost 10 years until January 1973 when it was shut down after accumulating 98,000 Mega Watt Days (MWD) of operation.

The reactor was defueled from January to July 1973. During that time, the reactor fuel element assemblies (all special nuclear material, source material, and radioactive waste generated at that time) were removed from the PBRF and preliminary decontamination was performed. The fuel assemblies were transferred and reprocessed offsite and the radioactive wastes were disposed of offsite at licensed commercial facilities. The PBRF systems and support facilities not required for safe storage were maintained (mothballed) for possible future operations. During 1997 and 1998, NASA management decided to decontaminate and decommission the PBRF to allow termination of the NRC licenses and release the PBRF for unrestricted use.

The PBRF consists of six major buildings, several subsurface "tunnels", three water holding basins and an effluent release "ditch". The major structures include the Containment, the Reactor Building, the Hot Laboratory, the Reactor Office and Laboratory Building, the Waste Handling Building, the Primary Pump House

and the Fan House. Subsurface structures include the Hot Pipe Tunnel and the Cold Pipe Tunnel. The holding basins include the Hot Retention Basin, the Cold Retention Basin and the Emergency Retention Basin.

Reactor fuel was constructed of uranium/aluminum alloy fuel elements clad with aluminum alloy. The reactor fuel material was uranium enriched to about 93% in the U-235 isotope in an aluminum alloy of not more than 25% uranium by weight. The maximum core loading did not exceed 6 kg of U-235. Beryllium reflector pieces surrounded the fuel along with cadmium/beryllium regulating and shim rods. The core was moderated and cooled by de-ionized water which was pressurized by the elevation of water in the head tank and the head of the primary system pumps.

Most primary system piping and components are located in the Containment, the Reactor Building, the Primary Pump House and the Fan House. Primary systems were also present in portions of the Hot Pipe Tunnel. The primary cooling water system was subdivided into four groups, the main loop, the by-pass clean-up loop, the instrument and test hole cooling loop and the shutdown loop. The main loop was a closed loop, 26,000 gallon system that was routed from the reactor through 24 in. supply and return lines to the Primary Pump House where coolant water was passed through two primary heat exchangers, three primary pumps, a strainer and a flow meter and returned to the inlet supply line.

During reactor operation, the reactor tank was essentially a closed system. Experiments were inserted by means of two horizontal through tubes, six horizontal beam tubes, and two vertical experiment tubes, all of which are of aluminum alloy construction. However, direct interface with the canal system did occur, most notably in the hydraulic "rabbit" tubes, which transferred experiment materials in and out of the reactor tank using the difference in hydraulic pressure between the reactor coolant and the canals. During shutdown, materials and fuel elements were routinely transferred between the reactor tank and the canals.

The reactor tank and concrete biological shield are surrounded by four quadrants, three (A, C, and D) of which could be flooded with water for additional biological shielding. Quadrant B was a dry area. A system of canals was used to transfer materials or fuel assemblies to and from the reactor tank, the fuel storage area, and the adjacent Hot Laboratory. Quadrant D contained the underwater beam room. In the Hot Laboratory, materials were remotely transferred from the canals to either the hot cells or the Hot Dry Storage Area. It was here that irradiated materials were handled and tested.

The hot drain system consists of the drain collection systems for all wastewater drainage that originated directly or indirectly from a radioactively contaminated area. The system is made up of 12 collection sumps (located in the Fan House, Waste Handling Building, Reactor Office and Laboratory Building, Primary

Pump House, Hot Laboratory, Reactor Building, and inside the containment vessel) along with associated pumps and valves. Pumps were used to move liquids that had collected in the sumps to the Hot Retention Area.

The Mock-Up Reactor (MUR) was a 100KW swimming pool type reactor located in Canal H and setup to simulate the main Plum Brook Reactor. The MUR used the same uranium enriched aluminum alloy fuel assemblies, with the exception of uranium loadings, as the larger reactor core. As such, the nuclide distribution resultant from the operation of the MUR should be essentially the same as the distribution resultant from the operation of the larger reactor.

The secondary coolant system consisted of a single loop system that took waste heat from a pair of primary to secondary heat exchangers, carried it to a cooling tower for disposal, and then returned the water to the heat exchangers located within the Primary Pump House. The secondary system piping leaves the Reactor Building (RB) and proceeds down the length of the Cold Pipe Tunnel that connects the RB to the Service Equipment Building (SEB) and to the cooling tower.

The Hot Retention Area, located south of the Fan House, contains eight 60,000 gal and four 7500 gal steel underground storage tanks. The larger tanks, located in an underground concrete room, received all of the radioactively contaminated water from the hot drain system. The four smaller tanks were used as holding tanks. The contaminated water was treated and the water in the holding tanks was monitored and then discharged to the Cold Retention Basins, the quadrant and canal recirculating system, or to the Water Effluent Monitoring Station.

The Cold Retention Basins are two 500,000 gal below grade storage basins in the shape of inverted pyramids. The basins were used to store low-level radioactive water primarily from the quadrants and canals in the Reactor Building. During facility operations the basins were known to leak, so a plastic liner was installed. At the time of shutdown, the Cold Retention Basins were opened to permit groundwater to enter the structures to equalize the water levels in the groundwater and basins and prevent the basins from floating in the event of a high groundwater table. Silt and sludge accumulated on the side walls and bottoms of the basins.

4.2 Assessment of Historical and Operational Factors

The following conclusions were reached following an assessment of the lay-out, structures, systems and processes that were used during the operation of the PBRF. Reactor coolant systems containing reactor originated fission and corrosion products are prevalent in the Containment, the Reactor Building, the Hot Laboratory, the Primary Pump House, the Waste Handling Building, the Fan House and the Hot Pipe Tunnel. Other environmental areas were also directly impacted by exposure to either treated and/or untreated primary coolant, including

the Hot Retention Area, the Cold Retention Basins, the Emergency Retention Basin, the Water Effluent Monitoring Station, the Pentolite Ditch and Drainage System. Subsequently, it was anticipated that all the areas listed above should exhibit approximately the same radionuclide mixture.

One building, the Reactor Office and Laboratory Building (ROLB) did not contain any major systems that carried primary coolant. It is believed that the source of contamination discovered in the ROLB was from the importation and analysis of reactor coolant and reactor material samples. Radiological operational surveys taken in the fuel vault and in several laboratories located in the ROLB showed significant alpha contamination that was later identified as U-234 and U-235. Subsequent radiological characterization surveys did not identify U-234 and U-235 in any other of the impacted structures at the concentrations observed in the ROLB. As such, the ROLB was evaluated as an area that could exhibit a unique mixture.

In the Hot Laboratory, a wide variety of irradiated materials were unpackaged, directly handled and tested in this area. Subsequently, it is anticipated that the radionuclide distribution in the Hot Laboratory could also be significantly different from the balance of plant mixture.

4.3 Smear Samples of Structural Surfaces

As part of a previous investigation performed to substantiate the nuclide distribution that would be applicable to waste disposition, twenty-two (22) smear samples were acquired and subjected to 10 CFR Part 61 analyses in the 1st quarter of 2002. The samples were as follows;

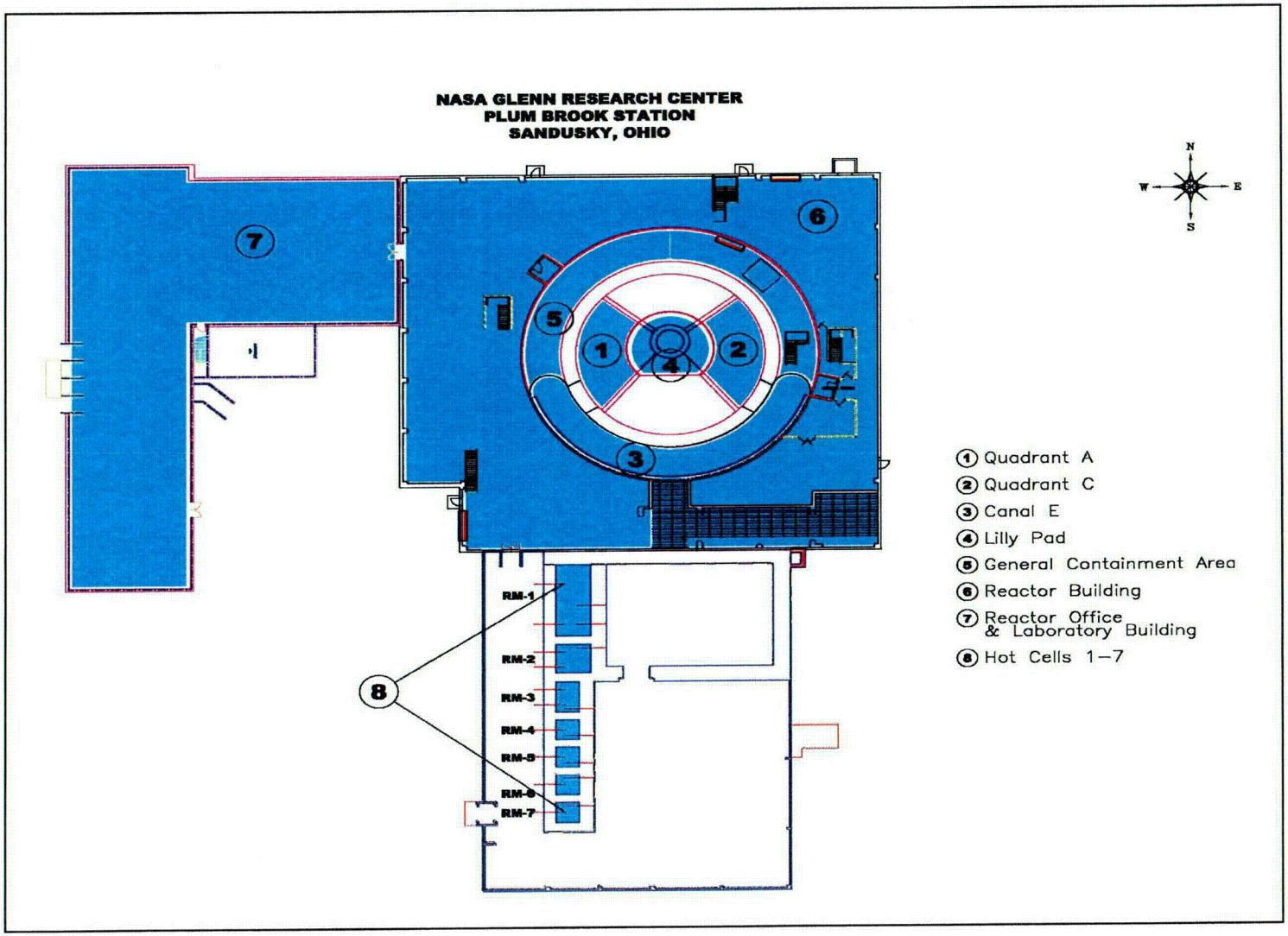
- 7 smears taken on loose equipment and materials in Hot Cells numbers 1 through 7,
- 7 smears taken on structural surfaces in Hot Cells numbers 1 through 7,
- 5 smears taken from within the Containment structure, including Quads A, Quad C, Canal E, the Lilly Pad and general area,
- 2 smears taken from the Reactor Office and Laboratory Building, and
- 1 smear taken from the Reactor Building.

In addition, alpha contamination was positively identified by direct measurement and on smear samples collected in the ROLB fuel vault and in several of the laboratories during the radiological evaluation of loose equipment in these areas for disposition and disposal. Additional smear samples were collected specifically at locations in the ROLB where positive alpha measurements were obtained. These smears were combined into composite samples and analyzed for isotopic content. To support the assessment of the nuclide mixture in the ROLB,

the results from these samples were added to the Part 61 smear sample population described above. The results of the analyses of these smear samples are presented in Addendum 1.

This Page Intentionally Left Blank

Figure 4-1, Part 61 Smear Populations Sample Locations



4.4 Concrete Core Sampling Strategy

In addition to the smears, concrete core bore samples were collected at various locations throughout the PBRF structures. A plan for concrete sample collection was prepared to ensure that core bore samples were collected at representative locations from each of the primary structures designated to remain and be subjected to FSS. Core samples were collected at biased locations in the areas known to be the most exposed to radioactive contamination during plant operation. Areas in lower levels of buildings, areas housing waste processing equipment, and areas near sumps and floor trenches were chosen.

The biased location of each core bore was selected by performing a beta scan of the floor area of the targeted structure. The location with the highest total surface contamination reading was identified and assessed for the presence of loose surface contamination. If loose surface contamination was detected, the location was decontaminated. If there was appreciable fixed contamination left following the decontamination, the location was selected for obtaining a core bore sample.

By obtaining the highest activity samples from each key structure, the likelihood of detecting nuclides with low activity levels was improved and the relative fractions of the MDA values were minimized. In total, sixteen core bore samples were obtained. One core sample broke during extraction and was unusable leaving 15 samples for analysis. Of the 15 samples, thirteen were used as sent for isotopic analysis. The other two core samples were saved for possible site-specific K_D analysis.

Under Characterization Survey Package Number C9000 101I1, core bore samples were acquired at the following locations:

- In the Reactor Building on the 0' elevation, southern floor, a core bore sample was acquired on the floor adjacent to a removable steel hatch cover. This sample broke during extraction and was subsequently unusable for further analysis.

- In the Reactor Building on the -25' elevation in the southwest quadrant, a core bore sample was acquired on the floor adjacent to the sump in the Area #22 Pump Room.

- In the Reactor Building on the -15' elevation in the east floor area, one core bore sample was acquired on the floor adjacent to the concrete shielding for the primary water piping systems.

- In the Primary Containment on the -25' elevation at the bottom of Canal "E", a core bore sample was acquired on the floor along the southern wall adjacent to the south canal entrance.

- In the Primary Containment on the -25' elevation in the west area, a core bore sample was acquired on the floor adjacent to the inner wall across from the west stairwell.

- In the Waste Handling Building on the -13' elevation, a core bore sample was acquired on the floor adjacent to the north building sump.

- In the Hot Laboratory on the 0' elevation, four core bore samples were acquired, one on the floor in front of Room #2, one on the floor in front of Room #6, one in the middle of the floor adjacent to Room #5 and one at the entrance to Room #16.

- In the Hot Pipe Tunnel on the -12' elevation, two core bore samples were acquired, one in the middle of the tunnel section to the east of the corner and one on the side by the corner. Two additional core samples were acquired and placed in storage.

- In the Fan House on the -12' foot elevation, one core bore sample was acquired on the floor adjacent to the air plenum and venture located against the north wall.

- In the Primary Pump House on the 0' elevation, three core bore samples were acquired, one on the floors of Room numbers 1, 2 and 4 respectively. These samples were not included as part of the sample population due to QA concerns that could not be resolved.

- In the Reactor Office and Laboratory Building (ROLB), one core sample was acquired on the floor of the New Fuel Vault.

Structures that could potentially contain activated concrete such as the bio-shield were not sampled because current decommissioning plans call for the removal of activated portions of the concrete bioshield and disposition of the activated concrete as radioactive waste.

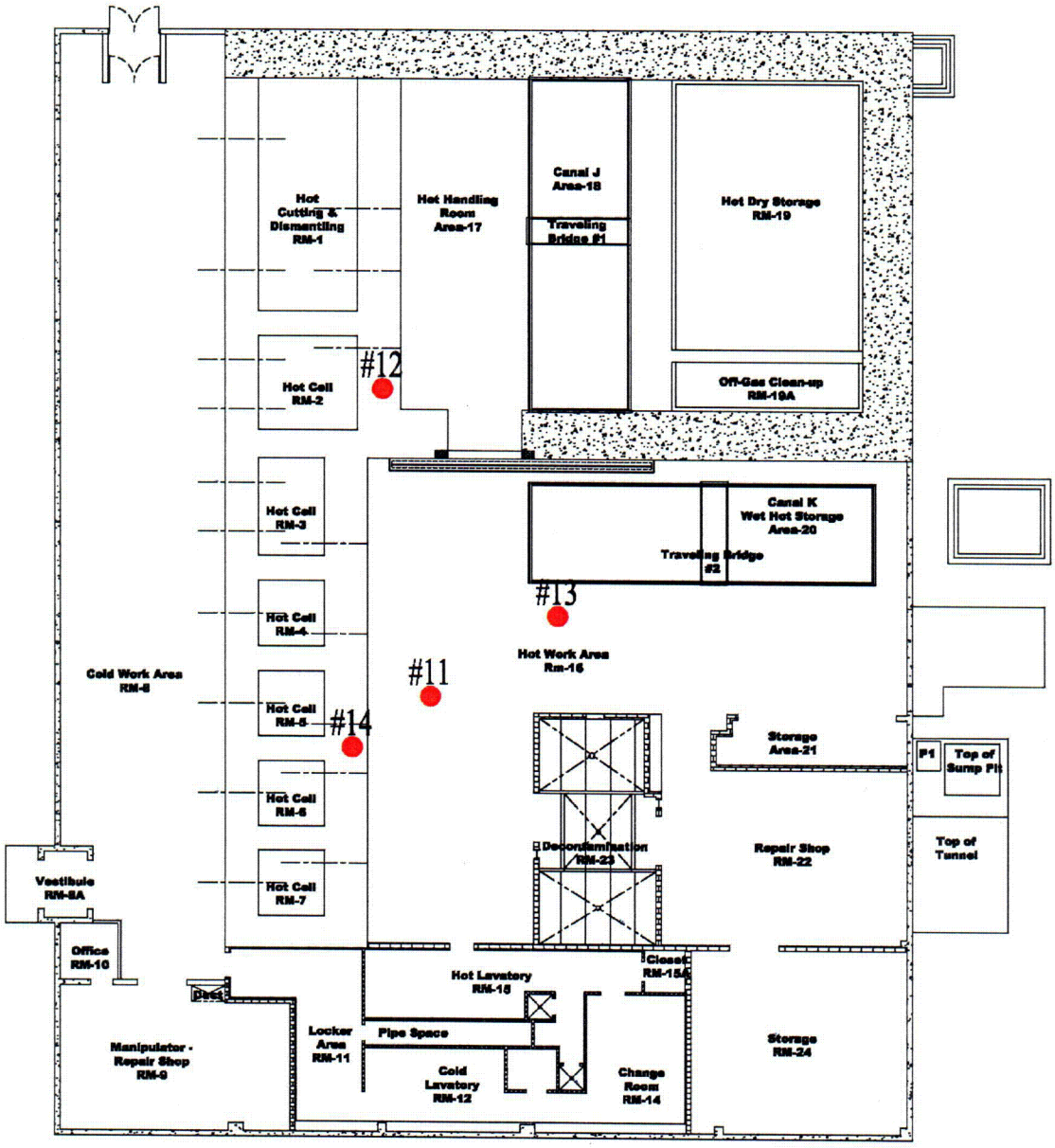
Each of the core samples was sliced and surveyed. Two ½ inch thick "pucks" were sliced from the top of each core. Direct alpha and beta measurements were obtained on both the tops and bottoms of each puck. A preliminary radionuclide analysis was performed on each puck using the PBRF on-site gamma spectroscopy system. This analysis was performed not to specifically assess the nuclide distribution, but rather to qualitatively evaluate the depth of contaminant migration into the concrete at each of these locations. Each ½ puck was analyzed twice, exposing the detector to both sides of each puck. The results of these analyses are presented in Addendum 2.

The data presented suggests that with the exception of the Hot Laboratory, the majority of the reactor produced radionuclides were confined to the 1st ½ inch of concrete surface. In the Hot Lab, the contaminant migration observed went deeper, at some locations to a depth of one inch.

After the preliminary radionuclide analysis was complete, the samples were sent to an off-site laboratory for a full isotopic analysis. The top 1 inch concrete core was pulverized and analyzed for full isotopic content. Samples were prepared by transfer of the sample to a standard geometry or by removing a representative aliquot from the sample and processing the sample in accordance with the analytical technology selected. Gamma emitting isotopes were analyzed using a high purity Germanium (HPGe) gamma detector. Analysis for low energy gamma emitters used a planar, high purity germanium, low energy response gamma ray detector. Analysis for beta emitting isotopes employed beta liquid scintillation and alpha emitting isotopes were analyzed using alpha spectroscopy. These results are presented in Addendum 6.

Figure 4-2, Concrete Core Population Sample Locations – Hot Laboratory

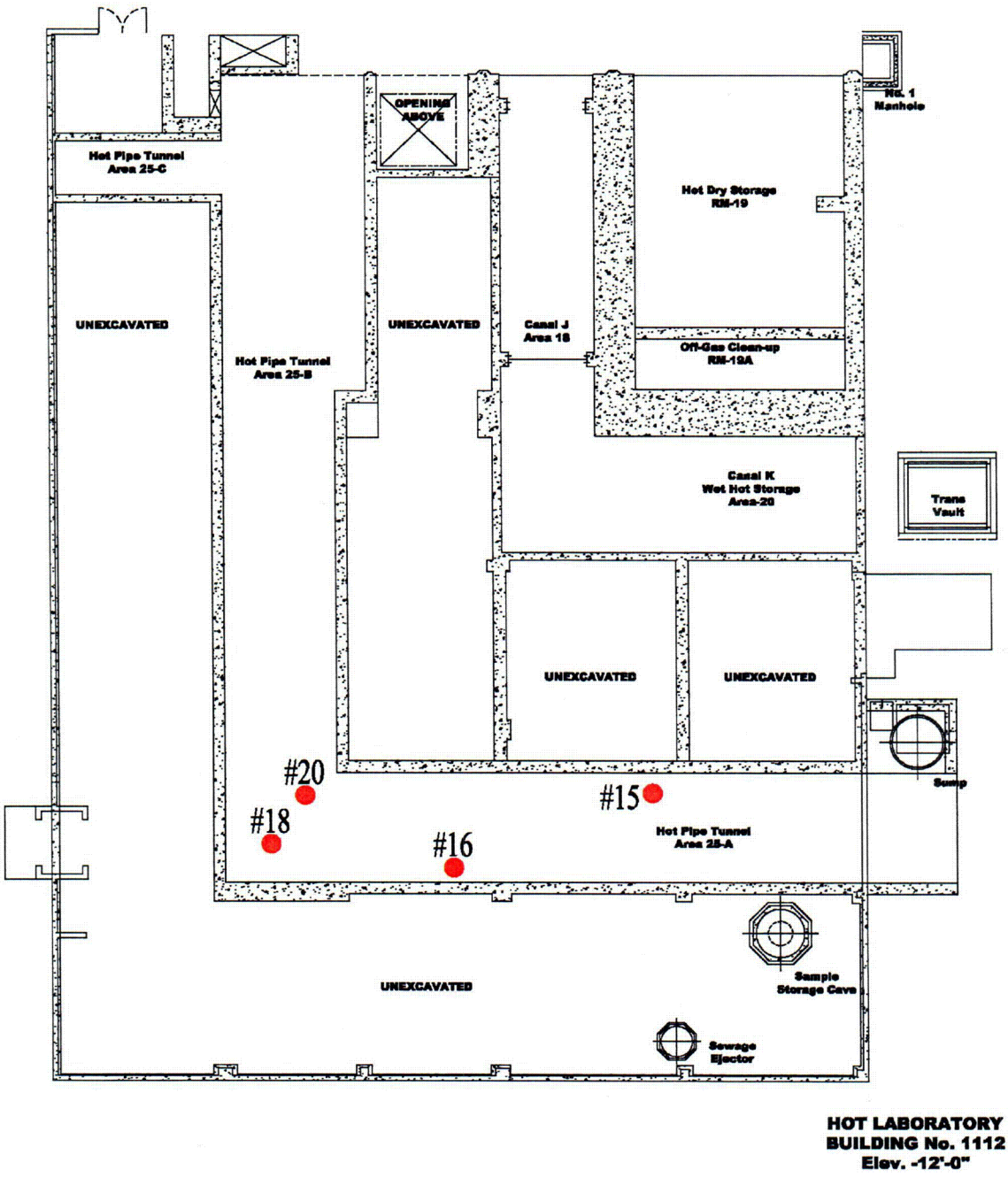
NASA GLENN RESEARCH CENTER
PLUM BROOK STATION
SANDUSKY, OHIO



HOT LABORATORY
BUILDING No. 1112
Elev. -0'-0"

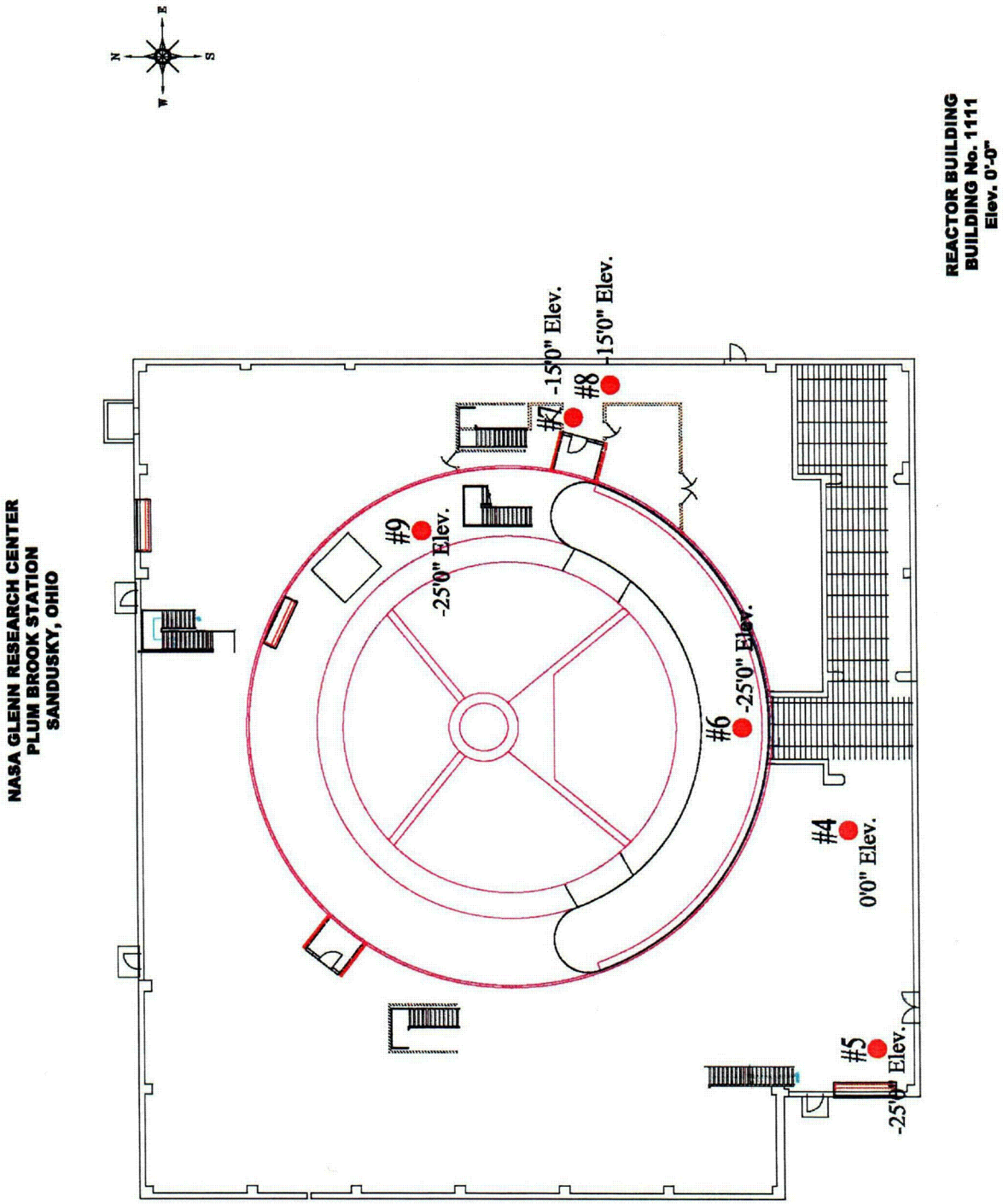
C2

Figure 4-3, Concrete Core Population Sample Locations – Hot Pipe Tunnel



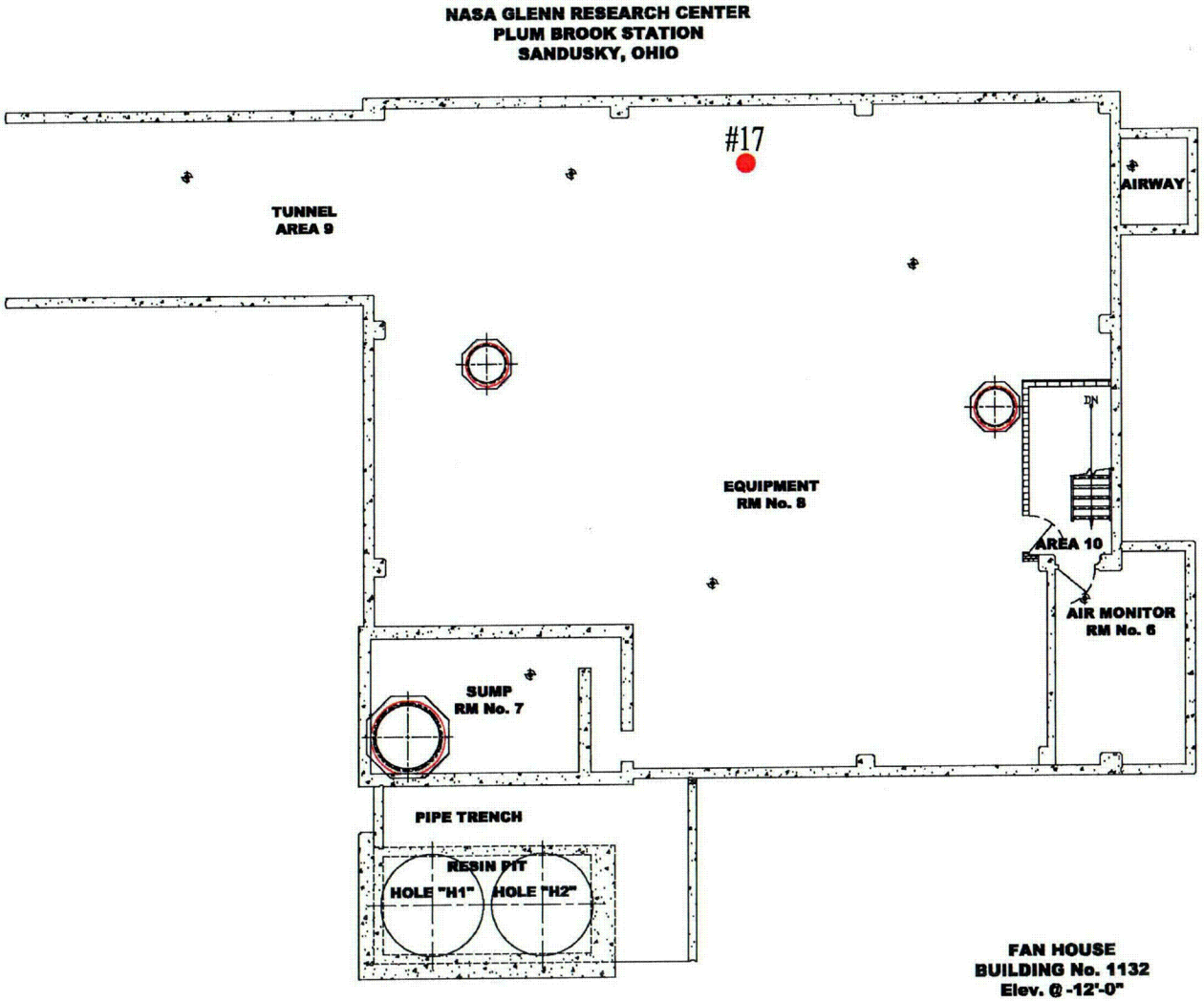
C3

Figure 4-4, Concrete Core Population Sample Locations – Reactor Building



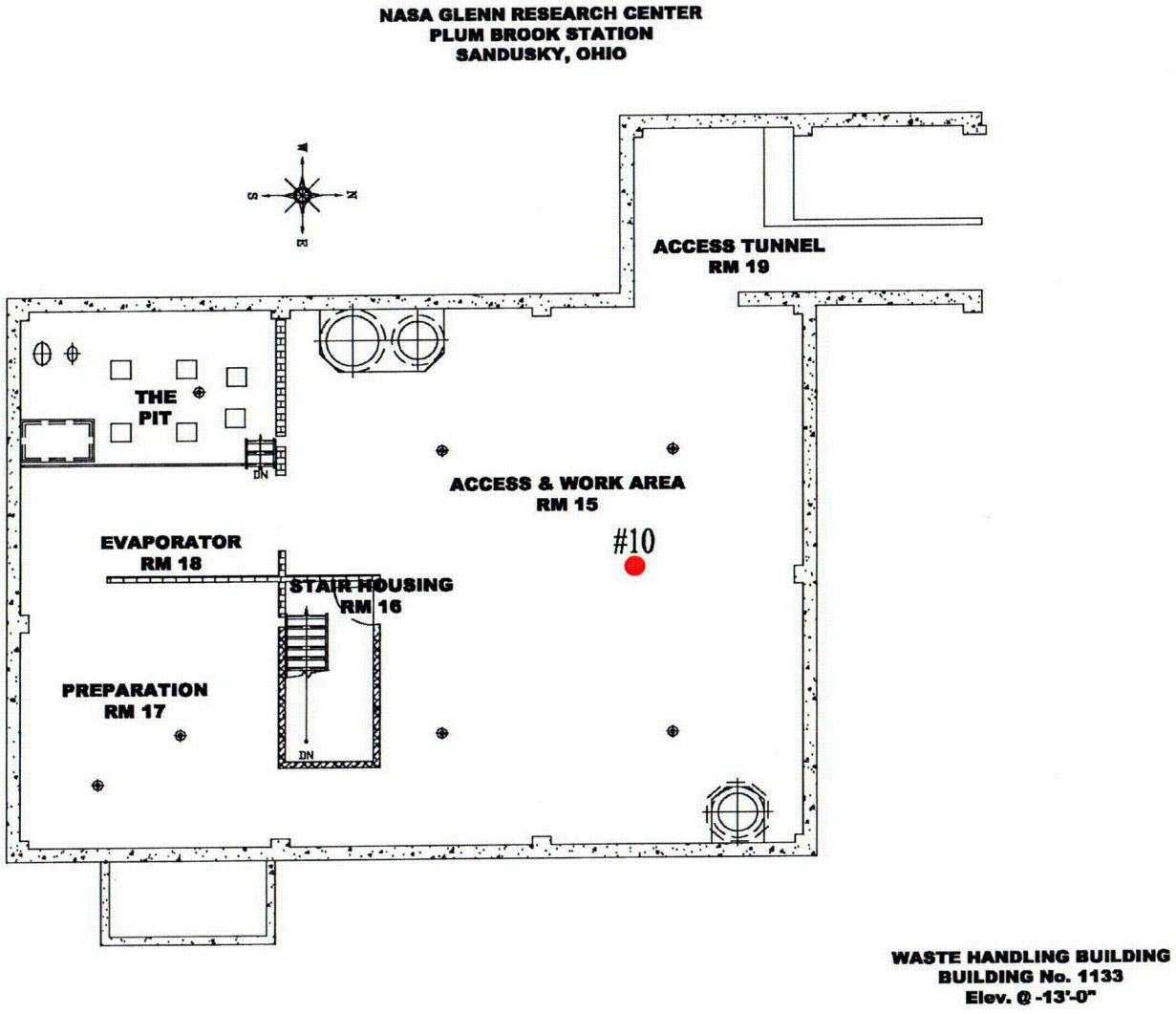
C4

Figure 4-5, Concrete Core Population Sample Locations – Fan House



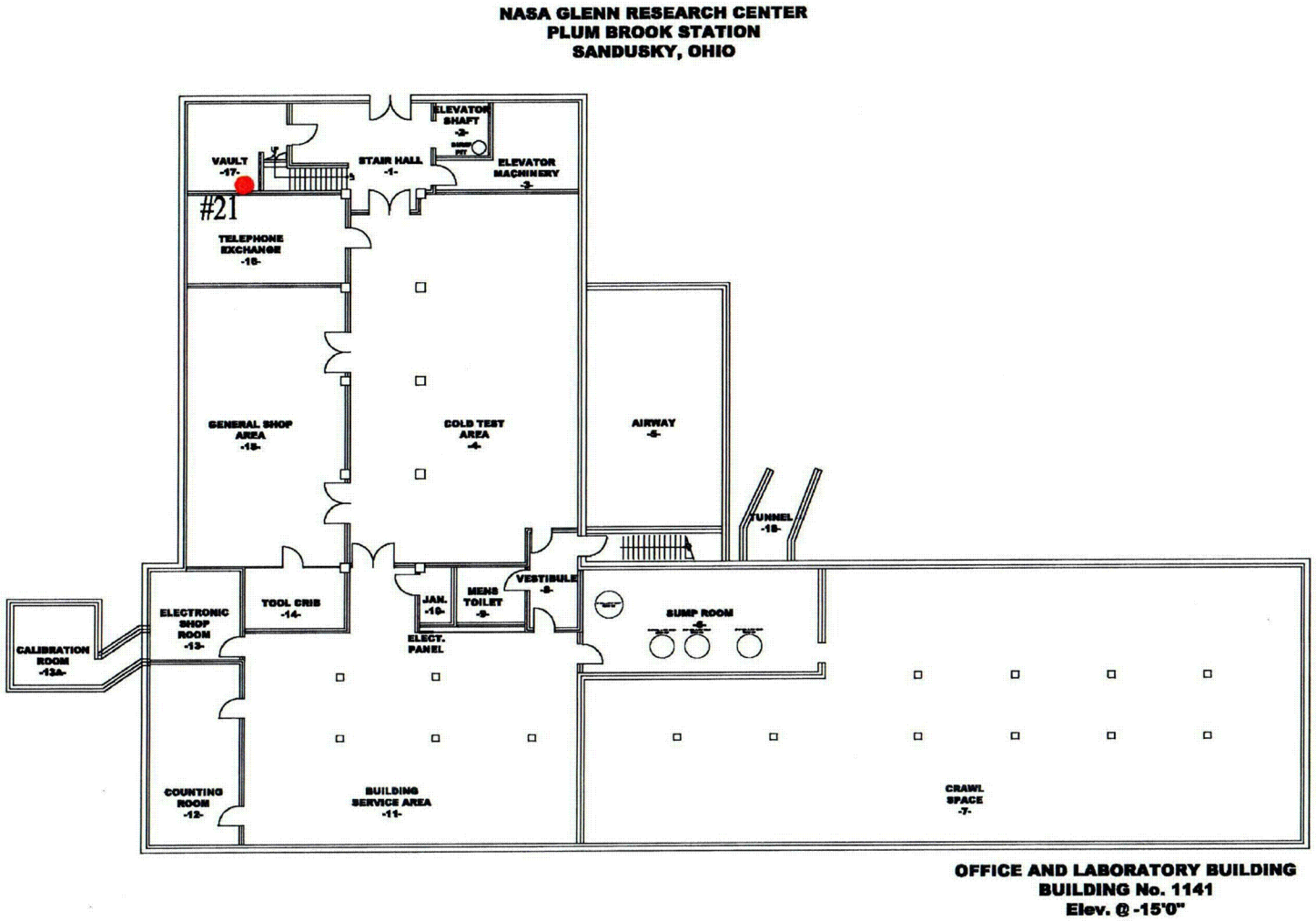
CS

Figure 4-6, Concrete Core Population Sample Locations – Waste Handling Building



C6

Figure 4-7, Concrete Core Population Sample Locations – ROLB



4.5 Soil Sampling Strategy

Surface soil samples were obtained to assess the radionuclide distribution in soils surrounding the facility. A sampling plan was developed and documented in characterization survey packages A2400 303C2 and A2100 101C2. Gamma scans surveys were performed within each survey unit using a NaI detector to ascertain the highest activity locations. Survey areas exhibiting scan results greater than twice the observed background were selected. At the area of highest observed scan activity, a one-liter soil sample was collected. Soil samples were collected and controlled on accordance with PBRF-CS-001, "Characterization Sample Identification and Chain-of-Custody" and sent to an off-site laboratory for full isotopic analysis. The soil samples were not dried prior to shipment. Once received by the off-site laboratory, samples were prepared by transfer of the sample material to a standard geometry or by removing a representative aliquot from the sample and processing the sample in accordance with the analytical technology selected. Gamma emitting isotopes were analyzed using a high purity Germanium (HPGe) gamma detector. Analysis for low energy gamma emitters used a planar, high purity germanium, low energy response gamma ray detector. Analysis for beta emitting isotopes employed beta liquid scintillation and alpha emitting isotopes were analyzed using alpha spectroscopy.

In total, eight soil samples were obtained: four from the Emergency Retention Basin and four from a suspected spill area south of the Waste Handling Building. Other open land areas on site also indicated elevated scan activity, however the eight locations selected were biased in order to acquire samples with relatively high isotopic concentrations in order to minimize the contribution of MDA values to the resultant nuclide distribution. Analytical results for the surface soil samples are presented in Attachment 4.

Figure 4-8, Surface Soil Population Sample Locations – WHB Spill Location

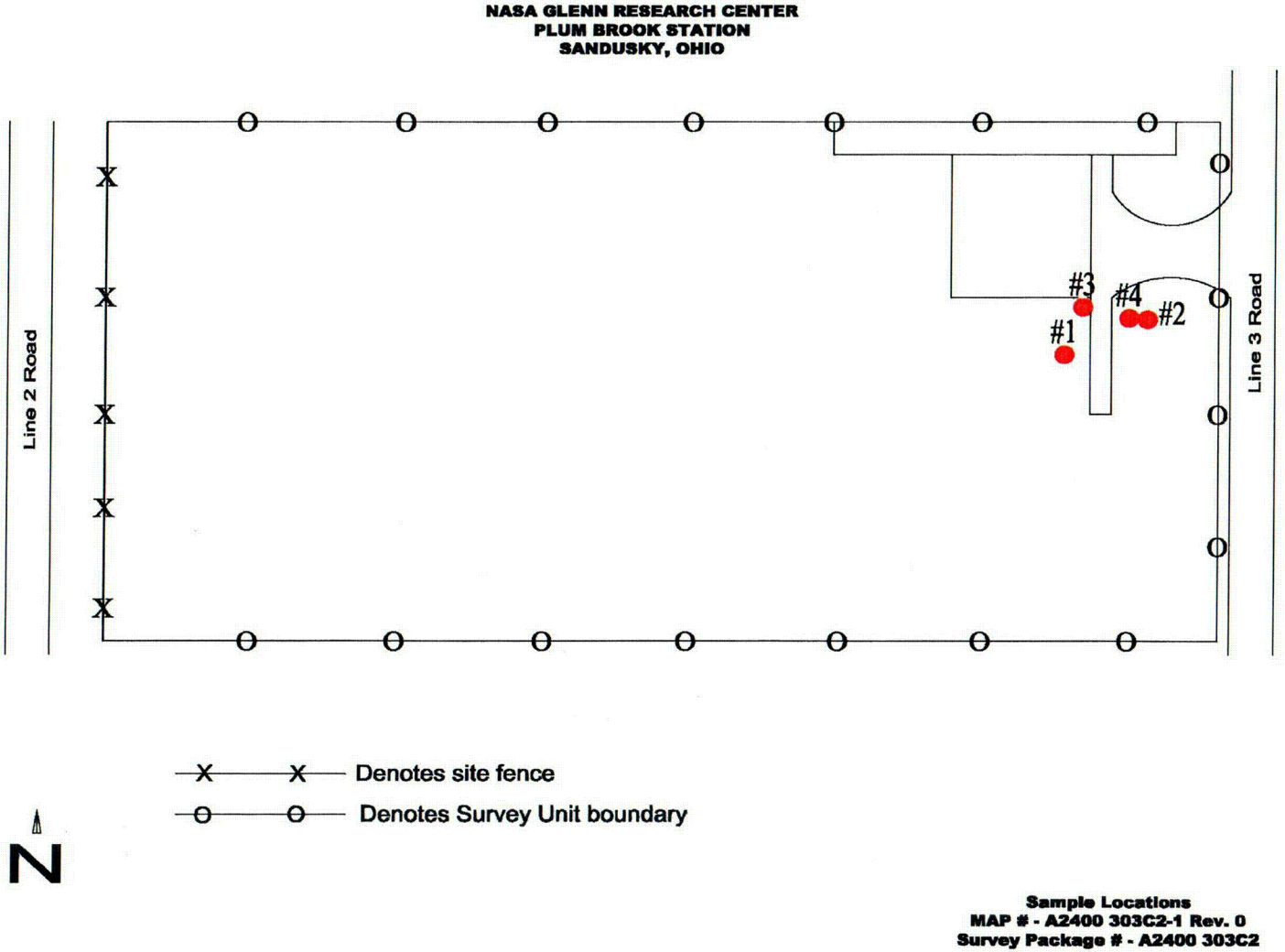
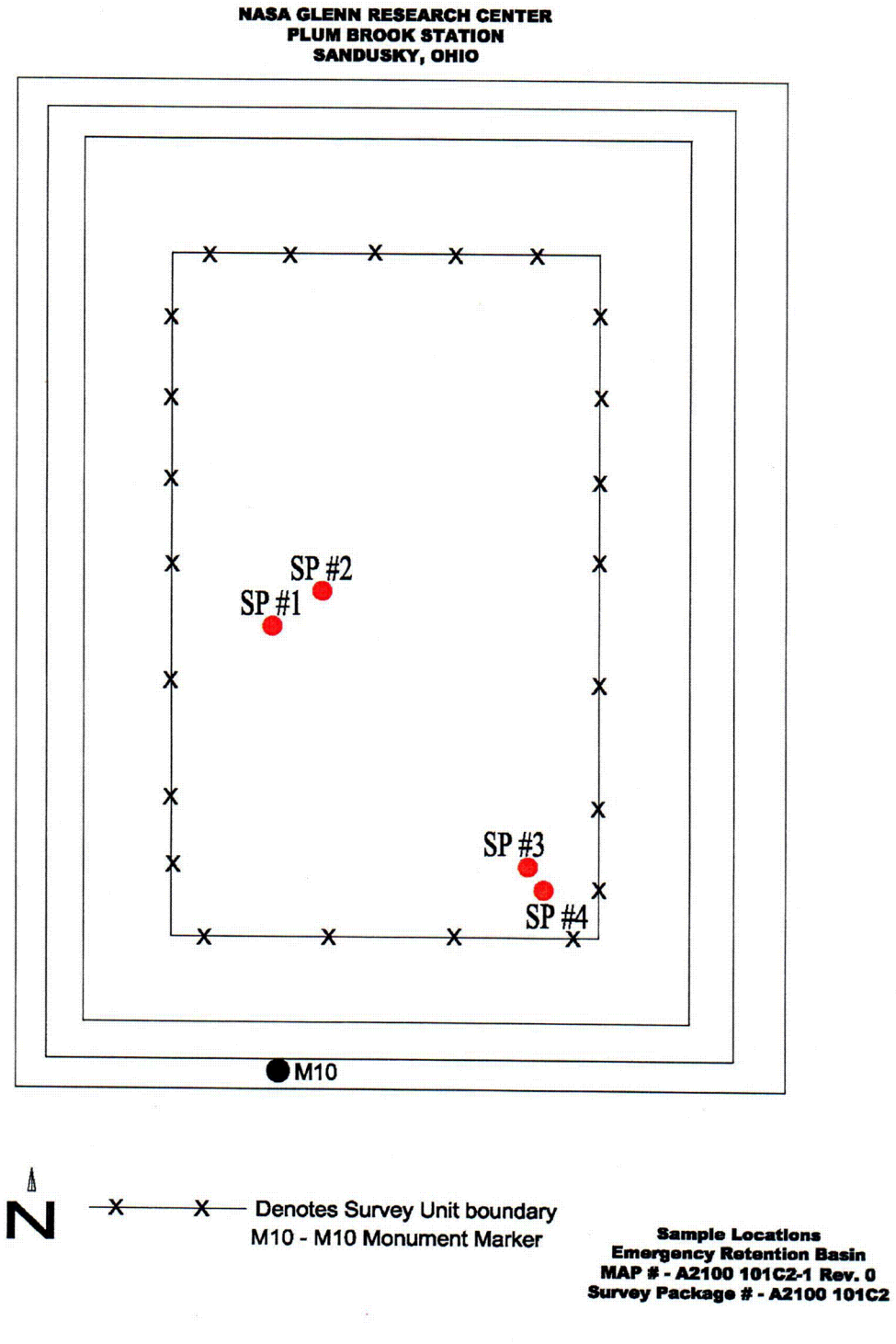


Figure 4-9, Surface Soil Population Sample Locations – ERB



C9

4.6 Sample Analysis

In all three sample types (smear samples, core samples and soil samples), before the nuclide distribution could be evaluated, the analysis results reported as less than MDA were considered. It was expected that several of the nuclides would be reported as less than MDA since these nuclides have a low probability of being present. Two approaches were considered for evaluating MDA results; 1) include the MDA values as representing actual concentrations, and 2) remove the less than MDA nuclides from the mixture. Removing the nuclides was considered more appropriate and representative of actual site conditions because the non-detected nuclides are believed either to not be present or to be present at negligible concentrations well below the MDA value. A nuclide was included in the "discarded" category if it was not detected, at concentrations above MDA, in any individual sample in the respective smear, core and/or soil sample population.

If a nuclide was detected above MDA in one or more samples in a given population, then the nuclide was retained and included in the mixture. For those radionuclides that were reported as positive in only a portion of the sample population, the MDA values were combined with the positive results to determine the mixture fraction. The MDA values were used in this case because it was conservatively assumed that if a radionuclide was positive in an individual sample then it could also be present in the remaining samples of the population. Using the MDA also has the effect of reducing the probability that a single positive radionuclide result in a given sample population will skew the overall percentage relationship between the isotopes when those percentages are normalized.

The remaining nuclides were then evaluated for the presence of naturally occurring isotopes. Naturally occurring isotopes were ignored in subsequent calculations.

4.7 Mean Distribution Evaluation

Following the analysis of all nuclides identified at activities greater than their respective MDAs, an assessment was performed to ascertain the activity of radionuclides that could be attributed to background. K-40, Pb-212, Pb-214, Bi-214, Th-228, Th-230, Th-232, and Ra-226 were detected at concentrations commensurate with levels normally found in background. Subsequently, these isotopes were removed from consideration in all the sample populations.

The radionuclide distribution percentage for each remaining nuclide was then calculated by dividing the concentration for each nuclide by the sum of all remaining radionuclide concentrations in the sample population expressing the abundance of the specific nuclide compared against the total sample activity. The mean nuclide distribution was then calculated by taking the average of the individual core nuclide fractions in each sample population.

The smear sample mean nuclide distribution in Table 4-1 below contains all remaining radionuclides that were above MDA in one or more smear samples.

Table 4-1 Smear Radionuclide Distribution

	Hot Laboratory	Balance of Plant	ROLB
Ag-108m	ND	0.06%	ND
Am-241	0.19%	0.13%	0.02%
C-14	0.20%	0.58%	0.26%
Co-57	0.03%	ND	ND
Co-60	2.38%	5.22%	0.98%
Cm-242	0.00%	ND	0.01%
Cm243/244	0.13%	0.02%	0.01%
Cm-245/246	ND	0.00%	ND
Cs-134	0.03%	ND	ND
Cs-137	43.69%	7.46%	16.62%
Eu-152	ND	0.13%	ND
Eu-154	0.08%	0.15%	ND
Eu-155	ND	ND	0.12%
Fe-55	2.75%	1.98%	ND
H-3	8.29%	66.53%	38.87%
I-129	0.02%	0.06%	2.66%
Na-22	0.03%	ND	ND
Nb-94	0.12%	0.03%	0.05%
Ni-59	0.33%	0.45%	1.68%
Ni-63	13.39%	13.66%	0.23%
Np-237	0.00%	ND	0.05%
Pu-238	0.11%	0.04%	ND
Pu-239/240	0.13%	0.02%	0.02%
Pu-241	1.19%	0.32%	0.45%
Pu-242	0.06%	ND	ND
Sb-125	ND	ND	0.23%
Sr-89	0.81%	0.03%	ND
Sr-90	25.43%	3.01%	4.03%
Tc-99	0.58%	0.12%	0.30%
U-233/234	0.03%	0.01%	31.87%
U-235/236	0.00%	ND	1.12%
U-238	0.00%	ND	0.42%

ND – Radionuclide not detected

The nuclide distribution for the BOP smear population indicates a nuclide distribution for H-3 of 66.53%. It is unlikely that the actual contribution of tritium to the nuclide distribution is of this magnitude.

The H-3 contribution is skewed by the inherent inaccuracy of the smear sample approach for material sampling as a means to quantify H-3 activity. The core sample data analysis provides a more realistic indication of H-3 concentrations as the core bore material sampling approach results in a volumetric sample medium more appropriate for the quantification of H-3. However, as the presence of H-3 has very little effect on the calculation of the adjusted gross DCGL, the distribution of H-3 in the smear populations was not adjusted.

The concrete core samples are believed to be more representative of the mixture that will remain after license termination than the smear samples because the majority of loose contamination will be removed during remediation. The majority of the potentially contaminated surfaces that will remain following structural remediation will be concrete.

Other contaminated material, such as buried and embedded pipe, may also remain. In this case, the nuclide distribution resultant from the smear population would be more representative as the contamination of the interior surfaces of the piping is primarily due to the entrapment and plating of loose contamination.

As previously stated, radionuclides that were not present in concentrations greater than their respective MDA values in any of the concrete core samples were removed from the mixture. These isotopes included Sb-125, Eu-152, Eu-154, Eu-155, Nb-95, I-129, Np-237, Ni-59, Tc-99 and Cm-243/244. The core sample taken in the ROLB indicated no activity greater than background. Subsequently, a nuclide distribution based upon core sample analysis results can not be presented for the ROLB at this time. The concrete core sample mean nuclide distribution in Table 4-2 below contains all remaining radionuclides that were above MDA in one or more core samples.

Table 4-2 Concrete Core Radionuclide Distribution

	Hot Laboratory		Balance of Plant		ROLB
Am-241	0.41%		0.29%		ND
C-14	1.97%		ND		ND
Co-60	0.65%		1.23%		ND
Cm-245/246	0.07%		0.19%		ND
Cs-137	78.04%		34.79%		ND
Fe-55	ND		18.93%		ND
H-3	0.83%		8.46%		ND
Ni-63	3.09%		19.71%		ND
Pu-238	0.06%		0.07%		ND
Pu-239/240	0.59%		0.06%		ND
Pu-241	0.81%		2.49%		ND
Sr-90	13.23%		11.74%		ND
U-233/234	0.14%		0.98%		ND
U-235/236	0.01%		0.09%		ND
U-238	0.11%		0.97%		ND

ND – Radionuclide not detected

In the surface soil samples, Th-228, Th-230, Th-232, Th-227, Ra-226, U-234, U-235 and U-238 were detected at concentrations commensurate with levels normally found in background (U-234 concentrations ranged from 0.793 pC/g to 1.876 pC/g, U-235 concentrations ranged from 0.051 pC/g to 0.197 pC/g and U-238 concentrations ranged from 0.850 pC/g to 1.861 pC/g). Subsequently, these isotopes were removed from consideration in the soil radionuclide distribution mixture. The soil nuclide distribution in Table 4-3 contains all remaining radionuclides that were above MDA in one or more surface soil samples.

Table 4-3 Surface Soil Radionuclide Distribution

	Open Land Areas
Am-241	0.15%
Am-243	0.16%
C-14	2.11%
Cm-245	0.22%
Co-60	1.68%
Cs-137	58.50%
Eu-155	0.76%
H-3	22.68%
I-129	0.53%
Nb-94	0.30%
Ni-63	6.96%
Pu-238	0.17%
Pu-239	0.16%
Sr-90	5.49%
U-236	0.12%

4.8 Application of the 10% Rule

Based on data reviewed to date and considering the PBRF operational history, there appear to be three radionuclide mixtures for site structures and one distribution for soils. For site structures, the first applies to the Hot Laboratory, the second to the ROLB and the third to the remaining structures designated as BOP.

The final step in determining the nuclide distribution for each of the mixtures involved the elimination of radionuclides that have insignificant dose consequences. NUREG-1757, Vol. 2, Section 3.3, states that nuclides with a combined dose of less than 10% of the 25 mrem/yr unrestricted use criteria can be eliminated from further consideration. To determine which nuclides can be eliminated by the "10%" rule, a RESRAD or RESRAD-Build run was performed using the mean nuclide distribution derived for each sample population. The concentration entered for each radionuclide was the fraction listed in Tables 4-1, 4-2 and 4-3, respectively. The RESRAD/RESRAD-Build runs used to perform the "10%" rule calculations are provided in Addendums 3, 5 and 7.

For the mean distribution derived from the smear samples, RESRAD-Build and RESRAD evaluations were performed for the Building Reuse and Subsurface Structure scenarios, respectively. Concrete K_d data were not available in the literature for three radionuclides with very low nuclide fractions; i.e. Na-22, Np-237, and Sb-125 at 0.03%, 0.00%, and 0.23%, respectively.

The RESRAD default K_d was used in the Subsurface Structure analysis for these radionuclides. Two radionuclides, Sr-89 and Cm-242, were reported as above MDA in one or more smear samples with mean fractions of 0.81% and 0.00%, respectively. RESRAD and RESRAD-Build do not list these radionuclides. Because of their very low fractions these nuclides were disregarded. In addition, Sr-89 is suspected to be a false positive because the half life is very short relative to the time since plant shutdown.

The radionuclides that, in aggregate, were less than 10% of the total dose for both of the scenarios were eliminated. The mixtures were readjusted to 100% based on the relative fractions of the radionuclides remaining after the insignificant radionuclides were removed. The adjusted FSS mixtures will be used to calculate surrogate and gross beta DCGLs.

The results of all RESRAD-Build and RESRAD runs, i.e. BOP, ROLB and Hot Lab mixtures in the Subsurface Structure and Building Reuse scenarios indicate that for the smear sample population, the aggregate dose from six radionuclides, i.e., Cs-137, Sr-90, Co-60, H-3, Eu-154 and I-129 resulted in 94% or more of the 25 mrem/yr limit in all BOP cases, the aggregate dose from five radionuclides, i.e., Cs-137, Sr-90, Co-60, H-3, and Eu-154 resulted in 93% or more of the 25 mrem/yr limit in all Hot Lab cases and the aggregate dose from seven radionuclides, i.e., Cs-137, Sr-90, Co-60, H-3, I-129, U-234 and U-235 resulted in 93% or more of the 25 mrem/yr limit in all ROLB cases.

For the core sample population, the aggregate dose from four radionuclides, i.e., Cs-137, Sr-90, Co-60 and H-3, resulted in 90% or more of the 25 mrem/yr limit in all BOP cases and the aggregate dose from three radionuclides, i.e., Cs-137, Sr-90 and Co-60 resulted in 92% or more of the 25 mrem/yr limit in all Hot Lab cases. As previously stated, a nuclide distribution based upon core sample analysis results can not be presented for the ROLB at this time due to the fact that the only available core sample indicated only background activity.

The lowest total aggregate dose from the remaining radionuclides was 90% of the 25 mrem/yr criterion, which means that radionuclides potentially representing a dose of 2.5 mrem/yr were eliminated. To ensure the 25 mrem/yr criterion is met, any structural survey unit where the mean of FSS results indicates that the dose may be greater than 22.5 mrem/yr dose (including dose from embedded pipe in the given survey unit, if applicable) shall be reviewed for compliance with the unrestricted use limit. The final normalized radionuclide distributions for structural surfaces are provided in Tables 4-4 and 4-5 below.

Table 4-5 Final Smear Radionuclide Distribution

	Hot Laboratory		Balance of Plant		ROLB
Co-60	3.41%		6.72%		1.01%
Cs-137	53.11%		7.74%		17.29%
Eu-154	0.12%		0.17%		
H-3	10.84%		82.15%		39.71%
I-129			0.08%		2.82%
Sr-90	32.52%		3.13%		4.17%
U-233/234					33.82%
U-235/236					1.19%

Table 4-6 Final Concrete Core Radionuclide Distribution

	Hot Laboratory		Balance of Plant
Co-60	0.79%		7.84%
Cs-137	83.45%		41.45%
H-3			35.35%
Sr-90	15.77%		15.36%

As previously stated, a nuclide distribution based on the smear sample populations would be more representative when applied to the interior surfaces of embedded piping. Subsequently the nuclide distributions resultant from the three different smear sample populations above were assessed for applicability. While acknowledging that both the Hot Laboratory and ROLB each has embedded piping, the majority of contaminated piping systems either originate or reside in the Reactor and Containment Buildings. Subsequently, it was determined that the BOP smear population would be most applicable to the embedded piping. While assessing the data results from within the BOP smear population, it is apparent that the concentration of Co-60 on smears taken from within the Containment in areas that had routinely flooded during reactor operations was significantly higher than areas outside of Containment. Therefore, in a conservative measure, the smears from the Reactor Building were removed from the sample population leaving only the smears taken from the quads and canals. This process also removed Eu-154 and I-129 from the mixture due to the fact that no samples remained in the population that exhibited positive results for these isotopes. The resultant nuclide distribution that will be used for embedded piping is presented in Table 4-7 below.

Table 4-7 Final Smear Based Radionuclide Distribution for Embedded Piping

	Embedded Pipe
Co-60	6.72%
Cs-137	0.19%
H-3	92.97%
Sr-90	0.12%

The nuclide mixture for embedded pipe is considered conservative because over 96% of the gamma radiation is from Co-60, which delivers the highest direct dose per disintegration. However, since the mixture was derived from smears collected on equipment and structure surfaces, additional confirmatory measurements will be performed as a part of the embedded pipe characterization that is planned to support the remediation and final survey of the embedded pipe. This characterization will include scrapings from the internal surfaces of the pipes. The radionuclide mixture derived from these scrapings will be checked to ensure that the embedded pipe dose assessment is conservative with the assumed mixture provided in Table 4-7.

Special consideration will be given to the confirmatory assessment of the primary water pipes (PWP) to ensure that PWPs close to the reactor are evaluated for potential neutron activation. Note that the probability of significant neutron activation is believed to be low. In addition, the confirmatory scrapings of the PWPs will be evaluated to check for the presence of europium isotopes because these isotopes were reported as being present in the one PWP residue sample collected as a part of the 1985 PBRF characterization report. Note that a check calculation was performed to confirm that the mixture used in this TBD resulted in a higher dose than the PWP mixture reported in the 1985 characterization report.

For surface soil samples, the doses from all radionuclides other than Cs-137, Co-60, and Sr-90 totaled 0.5 mrem/yr. Because this dose is 2% of the 25 mrem/yr limit all of the radionuclides other than Cs-137, Co-60, and Sr-90 were eliminated from further consideration. To ensure the 25 mrem/yr criterion is met, any open land survey unit where the mean of FSS results indicates that the dose may be greater than 24.5 mrem/yr shall be reviewed for compliance with the unrestricted use limit. The final normalized radionuclide distributions for soils are provided in Table 4-8 below.

Table 4-8 Final Soil Radionuclide Distribution

	Open Land Areas
Co-60	2.56 %
Cs-137	89.08 %
Sr-90	8.36 %

4.9 Comparison of Nuclide Distributions from Smear and Concrete Samples using the Building Reuse Scenario

To evaluate the relative differences between the smear and core distributions and the variability within each population, the results from each individual core and smear sample were converted to gross beta DCGLs. The DCGLs were used for the comparison because they best represent dose and allow for a risk-informed evaluation.

To support the surrogate approach, the nuclides in Tables 4-5 and 4-6 were segregated into three categories; detectable beta emitters, hard-to-detect isotopes and alpha emitters. The remaining hard-to-detect nuclides were combined with an appropriate beta emitter using a surrogate approach. Based upon the high abundance of U-234 in the ROLB smear nuclide distribution, a separate adjusted gross DCGL was calculated for the alpha emitters, thus no surrogate for alpha emitters was necessary. For the remaining hard-to-detect beta emitters in the ROLB nuclide distribution and in BOP smear distribution, Cs-137 was used as the surrogate for H-3 and I-129.

For the BOP core distribution, Cs-137 was used as the surrogate for I-129. For the Hot Lab smear distribution, Cs-137 was used as the surrogate for H-3. No surrogate was necessary for the Hot Lab core distribution.

Gross beta DCGLs were calculated for each smear and core sample using the conservative Building Reuse DCGLs. The results are provided in the following tables.

Table 4-9 Adjusted Gross DCGLs Calculated for Individual BOP Core & Smear Samples

Core Samples	
Location	**DCGL ($dpm/100cm^2$)**
Rx Bldg -25ft, Area 22	13979
CTMT -25 ft, Canal E	38549
Rx Bldg -15 ft, SE Area	26661
CTMT -25 ft, Area 18	25349
Waste Handling Bldg, -15 ft	40492
Hot Pipe Tunnel, -12 ft	38407
Hot Pipe Tunnel, -12 ft	34007
Fan House -12 ft	28404
Mean	30731
Standard Deviation	8925

Smear Samples	
Location	**DCGL ($dpm/100cm^2$)**
Quad A Smear	10998
Quad C Smear	10971
Canal E Smear	11086
Lilly Pad Smear	10202
CTMT General Area Smear	11260
Rx Building Smear	32412
Rx Building Smear Duplicate	22655
Mean	15655
Standard Deviation	8596

Table 4-10 Adjusted Gross DCGLs Calculated for Individual Hot Lab Core & Smear Samples

Core Samples	
Location	**DCGL ($dpm/100cm^2$)**
Hot Laboratory 0 ft #1	40185
Hot Laboratory 0 ft #2	34470
Hot Laboratory 0 ft #3	39587
Hot Laboratory 0 ft #4	39729
Mean	38493
Standard Deviation	2694

Smear Samples	
Location	**DCGL ($dpm/100cm^2$)**
Hot Cell Equipment #1 Smear	27172
Hot Cell Equipment #2 Smear	35982
Hot Cell Equipment #3 Smear	33685
Hot Cell Equipment #4 Smear	25204
Hot Cell Equipment #5 Smear	39322
Hot Cell Equipment #6 Smear	34581
Hot Cell Equipment #7 Smear	34048
Hot Cell #1 Surface Smear	33665
Hot Cell #2 Surface Smear	30244
Hot Cell #3 Surface Smear	31623
Hot Cell #4 Surface Smear	34433
Hot Cell #5 Surface Smear	37456
Hot Cell #6 Surface Smear	36686
Hot Cell #7 Surface Smear	38002
Mean	33722
Standard Deviation	4027

Regardless of the fact that no core data is available for comparison, adjusted gross DCGLs were also calculated for the ROLB smear population. The results are provided in the following table.

Table 4-11 Adjusted Gross DCGLs Calculated for Individual ROLB Smear Samples

ROLB Smear Samples		
Location		**DCGL**
		(dpm/100cm²)
ROLB Smear	Alpha	31197
	Beta	32792
ROLB Smear Duplicate	Alpha	31250
	Beta	32790
ROLB Smear 2	Alpha	31335
	Beta	22036
ROLB Smear 2 Duplicate	Alpha	31320
	Beta	22122
Mean	Alpha	31276
	Beta	27435
Standard Deviation	Alpha	64
	Beta	6185

4.10 Comparison of Nuclide Distributions from Smear and Concrete Samples using the Most Likely Future Use Scenario

An additional evaluation of the nuclide distribution data was performed by substituting the most conservative, nuclide-specific DCGLs ($DCGL_{FSS}$) with the Subsurface Structure Effective Surface DCGLs. The Subsurface Structure Effective Surface DCGLs represent the most likely future use scenario because the building will be demolished and used as backfill. The most conservative DCGLs apply predominantly to Building Reuse. The recalculation of gross beta DCGLs for each individual concrete core and smear sample using the Subsurface Structure DCGLs are provided in Addendums 1 and 6. The results are summarized below in Tables 4-12 through 4-14.

Table 4-12 Adjusted Gross DCGLs Calculated for Individual BOP Core & Smear Samples – (Subsurface Structure Effective Surface DCGLs)

Core Samples	
Location	**DCGL ($dpm/100cm^2$)**
Rx Bldg -25ft, Area 22	109440
CTMT -25 ft, Canal E	121407
Rx Bldg -15 ft, SE Area	61188
CTMT -25 ft, Area 18	61282
Waste Handling Bldg, -15 ft	121874
Hot Pipe Tunnel, -12 ft	81629
Hot Pipe Tunnel, -12 ft	40272
Fan House -12 ft	51649
Mean	81093
Standard Deviation	32545

Smear Samples	
Location	**DCGL ($dpm/100cm^2$)**
Quad A Smear	117701
Quad C Smear	146309
Canal E Smear	150302
Lilly Pad Smear	71728
CTMT General Area Smear	73485
Rx Building Smear	67878
Rx Building Smear Duplicate	82859
Mean	101466
Standard Deviation	36058

Table 4-13 Adjusted Gross DCGLs Calculated for Individual Hot Lab Core & Smear Samples – (Subsurface Structure Effective Surface DCGLs)

Core Samples	
Location	**DCGL ($dpm/100cm^2$)**
Hot Laboratory 0 ft #1	118168
Hot Laboratory 0 ft #2	53733
Hot Laboratory 0 ft #3	95889
Hot Laboratory 0 ft #4	110110
Mean	94475
Standard Deviation	28681

Smear Samples	
Location	**DCGL ($dpm/100cm^2$)**
Hot Cell Equipment #1 Smear	57577
Hot Cell Equipment #2 Smear	68725
Hot Cell Equipment #3 Smear	52849
Hot Cell Equipment #4 Smear	63166
Hot Cell Equipment #5 Smear	92553
Hot Cell Equipment #6 Smear	55824
Hot Cell Equipment #7 Smear	51216
Hot Cell #1 Surface Smear	47176
Hot Cell #2 Surface Smear	54582
Hot Cell #3 Surface Smear	62775
Hot Cell #4 Surface Smear	56639
Hot Cell #5 Surface Smear	74010
Hot Cell #6 Surface Smear	66702
Hot Cell #7 Surface Smear	90973
Mean	63912
Standard Deviation	13858

Table 4-14 Adjusted Gross DCGLs Calculated for Individual ROLB Smear Samples – (Subsurface Structure Effective Surface DCGLs)

ROLB Smear Samples		
Location		**DCGL** ($dpm/100cm^2$)
ROLB Smear	Alpha	1185479
	Beta	73755
ROLB Smear Duplicate	Alpha	1187999
	Beta	74441
ROLB Smear 2	Alpha	1192093
	Beta	34021
ROLB Smear 2 Duplicate	Alpha	1191366
	Beta	34286
Mean	Alpha	1189234
	Beta	54126
Standard Deviation	Alpha	3073
	Beta	23064

The data in Tables 4-12 through 4-14 show that the gross beta DCGLs calculated using the more realistic Subsurface Structure Effective Surface DCGLs are higher by a factor of 2 to 3 compared to the most conservative DCGLs (i.e., the dose is lower by a factor of 2 to 3). This comparison provides confidence that there is a reasonable margin of safety in the gross beta DCGLs calculated from either the core or smear distributions when the most conservative DCGLs are used.

5.0 Conclusion

A comparison of the smear and core data show that with the exception of the smear samples taken from within the Containment structure, the difference in the resultant adjusted gross DCGLs is relatively small. The reason for the difference between the Containment core samples and the Containment smear sample is the higher Co-60/Cs-137 ratio in the smear samples.

The Co-60/Cs-137 ratio in the Containment smear samples averaged 27 to 1. However the core samples taken in the Containment had a Co-60/Cs-137 ratio of 1 to 28. The Reactor Building, Hot Laboratory and ROLB smear and core populations all exhibit Cs-137 to Co-60 ratios of over 7 to 1. The differences between the Co/Cs ratios in the smears and cores can be attributed to the fact that Co-60 is a relatively insoluble corrosion product that is primarily found as loose contamination. The transportability/diffusion of Co-60 into concrete is relatively low, particularly when compared to the soluble Cs-137. Subsequently, the abundance of Co-60 relative to Cs-137 in the concrete core samples is substantially less.

While acknowledging that the DCGL calculations do include an assumption that up to 10% removable contamination will be present, which is best represented by the smear sample mixture, the radiological nuclide distribution found in concrete core samples is more representative of the actual condition of structures that will remain and be subjected to FSS because the majority of loose contamination will be removed during remediation. Therefore, it is concluded that the nuclide distributions for the cores that are provided in Table 4-6 are appropriate and conservative when applied to structural surfaces outside of the ROLB.

The BOP core population does not include samples from a number of BOP locations such as the primary pump house and quads. However, the cores collected are considered representative of all BOP areas because the predominant source of contamination in all areas is reactor coolant. Additional confirmatory samples and/or measurements will be performed in appropriate BOP areas to confirm the assumption that the cores collected are representative of all BOP areas.

Using these mean distributions from Table 4-6 result in adjusted gross DCGLs of 29,329 dpm/100cm^2 for BOP and 38,493 dpm/100cm^2 for the Hot Lab. Due to the fact that no positive core sample results are available for the ROLB, the smear nuclide distribution for the ROLB presented in Table 4-5 should be used. This mean distribution results in an adjusted gross DCGL of 31,327 dpm/100cm2 for alpha and 26,798 dpm/100cm2 for beta in the ROLB. When simultaneously applying the adjusted gross DCGLs for alpha and beta in the ROLB, the unity rule must be used.

6.0 Addendums

Addendum 1 - Results of Isotopic Analysis of Smear Samples
Addendum 2 - Preliminary Analysis of Concrete Core "Puck" Samples by the On-Site Laboratory
Addendum 3 - RESRAD and RESRAD-BUILD Models Used for Evaluation of Structural Radionuclide Distribution Using Smear Samples
Addendum 4 - Results of Isotopic Analysis of Surface Soil Samples
Addendum 5 - RESRAD Models Used for Evaluation of Soil Radionuclide Distribution
Addendum 6 - Results of Isotopic Analysis of Concrete Core Samples
Addendum 7 - RESRAD and RESRAD-BUILD Models Used for Evaluation of Structural Radionuclide Distribution Using Core Samples

Final Status Survey Plan
for the
Plum Brook Reactor Facility

Attachment A

Radionuclide Distribution Basis for DCGL Determination, and Final Status Survey of the Plum Brook Reactor Facility (PBRF)

Addendum 1
Results of Isotopic Analysis of Smear Samples

HOT LABORATORY

	Hot Cell Equipment #1 Smear (pCi/filter)				Hot Cell Equipment #2 Smear (pCi/filter)				Hot Cell Equipment #3 Smear (pCi/filter)			
	Results	MDA	Used	Distribution	Results	MDA	Used	Distribution	Results	MDA	Used	Distribution
Am-241	7.27E+03	6.85E+00	7.27E+03	0.15%	3.00E+02	5.05E-01	3.00E+02	0.07%	1.35E+02	8.83E-01	1.35E+02	0.11%
C-14	9.25E+02	1.37E+03	1.37E+03	0.03%	1.24E+02	6.12E+01	1.24E+02	0.03%	2.40E+02	6.21E+01	2.40E+02	0.20%
Co-57	0.00E+00	1.20E+02	1.20E+02	0.00%	0.00E+00	6.26E+01	6.26E+01	0.01%	0.00E+00	2.94E+01	2.94E+01	0.02%
Co-60	2.74E+05	1.24E+02	2.74E+05	5.73%	8.64E+03	2.25E+01	8.64E+03	1.94%	2.67E+03	1.27E+01	2.67E+03	2.26%
Cm-242	2.61E+00	7.82E+00	7.82E+00	0.00%	3.77E-01	7.22E-01	7.22E-01	0.00%	1.65E-01	2.47E-01	2.47E-01	0.00%
Cm-243/244	2.24E+02	2.25E+01	2.24E+02	0.00%	7.55E+00	7.32E-01	7.55E+00	0.00%	2.88E+00	5.50E-01	2.88E+00	0.00%
Cs-134	4.14E+02	1.71E+02	4.14E+02	0.01%	4.01E+01	6.92E+01	6.92E+01	0.02%	8.03E+00	3.01E+01	3.01E+01	0.03%
Cs-137	8.07E+05	2.06E+02	8.07E+05	16.89%	2.71E+05	6.98E+01	2.71E+05	60.88%	4.51E+04	3.22E+01	4.51E+04	38.23%
Eu-154	1.79E+03	3.69E+02	1.79E+03	0.04%	0.00E+00	8.27E+01	8.27E+01	0.02%	1.94E+02	7.49E+01	1.94E+02	0.16%
Fe-55	1.69E+05	7.58E+01	1.69E+05	3.54%	3.44E+03	3.85E+03	3.85E+03	0.86%	1.00E+03	4.09E+03	4.09E+03	3.47%
H-3	6.26E+05	3.49E+02	6.26E+05	13.10%	4.69E+03	2.53E+02	4.69E+03	1.05%	1.73E+03	4.51E+02	1.73E+03	1.47%
I-129	-2.31E+00	2.32E+01	2.32E+01	0.00%	2.03E+00	2.14E+01	2.14E+01	0.00%	1.25E-01	8.51E+00	8.51E+00	0.01%
Na-22	0.00E+00	1.18E+02	1.18E+02	0.00%	4.81E+01	1.59E+02	1.59E+02	0.04%	0.00E+00	1.42E+01	1.42E+01	0.01%
Nb-94	4.99E+04	1.52E+02	4.99E+04	1.04%	1.50E+01	2.92E+01	2.92E+01	0.01%	1.18E+02	1.57E+01	1.18E+02	0.10%
Ni-59	6.28E+03	2.90E+02	6.28E+03	0.13%	1.86E+02	1.98E+02	1.98E+02	0.04%	2.11E+02	2.70E+02	2.70E+02	0.23%
Ni-63	9.42E+05	1.80E+06	1.80E+06	37.67%	3.76E+04	1.80E+03	3.76E+04	8.45%	1.56E+04	8.28E+02	1.56E+04	13.22%
Np-237	2.03E+00	2.65E-01	2.03E+00	0.00%	2.60E-01	2.60E-01	2.60E-01	0.00%	2.58E-01	2.58E-01	2.58E-01	0.00%
Pu-238	3.56E+03	2.04E+01	3.56E+03	0.07%	2.17E+02	6.34E+00	2.17E+02	0.05%	7.52E+01	5.55E+00	7.52E+01	0.06%
Pu-239/240	3.65E+03	2.04E+01	3.65E+03	0.08%	3.11E+02	2.51E+00	3.11E+02	0.07%	1.79E+02	2.91E+00	1.79E+02	0.15%
Pu-241	3.16E+04	2.37E+02	3.16E+04	0.66%	2.39E+03	1.65E+02	2.39E+03	0.54%	8.07E+02	1.83E+02	8.07E+02	0.68%
Pu-242	2.56E+01	3.59E+01	3.59E+01	0.00%	5.07E+00	3.46E+00	5.07E+00	0.00%	4.24E+00	1.16E+00	4.24E+00	0.00%
Sr-89	-9.60E+04	2.20E+02	2.20E+02	0.00%	-2.16E+04	2.42E+02	2.42E+02	0.05%	-6.00E+03	2.70E+02	2.70E+02	0.23%
Sr-90	8.27E+05	3.49E+02	8.27E+05	17.31%	1.15E+05	3.50E+02	1.15E+05	25.84%	4.63E+04	3.65E+02	4.63E+04	39.25%
Tc-99	1.68E+05	4.19E+02	1.68E+05	3.52%	-3.26E+00	6.12E+01	6.12E+01	0.01%	6.71E+01	4.55E+01	6.71E+01	0.06%
U-233/234	6.69E+02	7.48E-01	6.69E+02	0.01%	4.23E+01	7.00E-01	4.23E+01	0.01%	2.48E+01	3.01E-01	2.48E+01	0.02%
U-235/236	4.34E+01	7.50E-01	4.34E+01	0.00%	2.84E+00	2.75E-01	2.84E+00	0.00%	1.11E+00	3.02E-01	1.11E+00	0.00%
U-238	9.58E+00	9.36E-01	9.58E+00	0.00%	4.57E+00	2.74E-01	4.57E+00	0.00%	8.02E-01	7.67E-01	8.02E-01	0.00%
			4.78E+06	100.00%			4.45E+05	100.00%			1.18E+05	100.00%

	Hot Cell Equipment #4 Smear (pCi/filter)				Hot Cell Equipment #5 Smear (pCi/filter)				Hot Cell Equipment #6 Smear (pCi/filter)			
	Results	MDA	Used	Distribution	Results	MDA	Used	Distribution	Results	MDA	Used	Distribution
Am-241	2.78E+01	2.45E-01	2.78E+01	0.09%	1.03E+02	7.73E-01	1.03E+02	0.03%	1.05E+02	2.01E-01	1.05E+02	0.37%
C-14	2.80E+01	3.37E+02	3.37E+02	1.11%	3.56E+00	3.59E+01	3.59E+01	0.01%	3.67E+01	3.89E+01	3.89E+01	0.14%
Co-57	5.23E+00	1.13E+01	1.13E+01	0.04%	8.33E+00	6.15E+01	6.15E+01	0.02%	0.00E+00	1.40E+01	1.40E+01	0.05%
Co-60	1.58E+03	1.23E+01	1.58E+03	5.20%	3.23E+02	7.08E+00	3.23E+02	0.10%	4.91E+02	7.50E+00	4.91E+02	1.74%
Cm-242	9.67E-02	7.40E-01	7.40E-01	0.00%	1.91E-01	2.86E-01	2.86E-01	0.00%	3.96E-01	2.38E-01	3.96E-01	0.00%
Cm-243/244	2.21E+00	7.83E-01	2.21E+00	0.01%	1.46E+00	9.96E-01	1.46E+00	0.00%	2.42E+00	2.02E-01	2.42E+00	0.01%
Cs-134	3.77E+00	1.47E+01	1.47E+01	0.05%	1.82E+01	6.52E+01	6.52E+01	0.02%	4.45E+00	1.54E+01	1.54E+01	0.05%
Cs-137	3.99E+03	1.61E+01	3.99E+03	13.13%	2.85E+05	6.04E+01	2.85E+05	86.87%	1.16E+04	1.47E+01	1.16E+04	41.10%
Eu-154	2.64E+01	3.99E+01	3.99E+01	0.13%	0.00E+00	3.04E+01	3.04E+01	0.01%	0.00E+00	3.11E+01	3.11E+01	0.11%
Fe-55	7.50E+02	2.90E+01	7.50E+02	2.47%	5.17E+02	8.52E+02	8.52E+02	0.26%	5.54E+02	7.98E+02	7.98E+02	2.83%
H-3	1.51E+04	3.94E+02	1.51E+04	49.70%	7.61E+01	2.70E+02	2.70E+02	0.08%	1.95E+02	2.63E+02	2.63E+02	0.93%
I-129	1.64E+00	1.83E+01	1.83E+01	0.06%	-4.97E+00	2.33E+01	2.33E+01	0.01%	-5.22E-01	6.17E+00	6.17E+00	0.02%
Na-22	9.55E+00	1.44E+01	1.44E+01	0.05%	1.33E+01	6.15E+00	1.33E+01	0.00%	1.53E+01	8.23E+00	1.53E+01	0.05%
Nb-94	-1.25E+00	1.27E+01	1.27E+01	0.04%	2.91E+00	9.20E+00	9.20E+00	0.00%	3.64E+00	8.03E+01	8.03E+01	0.28%
Ni-59	-4.30E+01	2.42E+02	2.42E+02	0.80%	1.62E+02	2.41E+02	2.41E+02	0.07%	1.17E+02	2.21E+02	2.21E+02	0.78%
Ni-63	4.50E+03	8.73E+02	4.50E+03	14.81%	1.42E+03	3.67E+02	1.42E+03	0.43%	3.75E+03	4.69E+02	3.75E+03	13.29%
Np-237	-1.57E-01	9.33E-01	9.33E-01	0.00%	4.30E-03	8.13E-01	8.13E-01	0.00%	3.62E-03	6.83E-01	6.83E-01	0.00%
Pu-238	1.86E+01	3.07E+00	1.86E+01	0.06%	5.51E+01	2.16E+00	5.51E+01	0.02%	5.64E+01	2.98E+00	5.64E+01	0.20%
Pu-239/240	1.55E+01	2.55E+00	1.55E+01	0.05%	1.04E+02	1.97E+00	1.04E+02	0.03%	4.55E+01	1.29E+00	4.55E+01	0.16%
Pu-241	1.92E+02	1.87E+02	1.92E+02	0.63%	7.39E+02	2.09E+02	7.39E+02	0.23%	7.10E+02	2.00E+02	7.10E+02	2.52%
Pu-242	4.77E-01	2.55E+00	2.55E+00	0.01%	2.49E+00	1.97E+00	2.49E+00	0.00%	3.26E-01	2.26E+00	2.26E+00	0.01%
Sr-89	-2.52E+02	2.85E+02	2.85E+02	0.94%	-6.86E+03	2.53E+02	2.53E+02	0.08%	-3.70E+03	2.47E+02	2.47E+02	0.88%
Sr-90	3.18E+03	3.94E+02	3.18E+03	10.47%	3.84E+04	2.87E+02	3.84E+04	11.71%	9.70E+03	3.54E+02	9.70E+03	34.37%
Tc-99	-1.45E+01	4.05E+01	4.05E+01	0.13%	4.67E+01	1.00E+01	4.67E+01	0.01%	2.44E+01	2.44E+01	2.44E+01	0.09%
U-233/234	3.88E+00	8.24E-01	3.88E+00	0.01%	8.16E+00	1.42E+00	8.16E+00	0.00%	2.15E+00	8.95E-01	2.15E+00	0.01%
U-235/236	3.24E-01	8.26E-01	8.26E-01	0.00%	5.32E-01	3.19E-01	5.32E-01	0.00%	1.87E-01	2.81E-01	2.81E-01	0.00%
U-238	8.62E-01	1.03E+00	1.03E+00	0.00%	2.12E-01	8.11E-01	8.11E-01	0.00%	2.80E-01	2.80E-01	2.80E-01	0.00%
			3.04E+04	100.00%			3.28E+05	100.00%			2.82E+04	100.00%

	Hot Cell Equipment #7 Smear (pCi/filter)				Hot Cell #1 Surface Smear (pCi/filter)				Hot Cell #2 Surface Smear (pCi/filter)			
	Results	MDA	Used	Distribution	Results	MDA	Used	Distribution	Results	MDA	Used	Distribution
Am-241	2.94E+02	2.63E-01	2.94E+02	0.07%	1.10E+03	1.89E-01	1.10E+03	0.05%	3.25E+03	6.96E+00	3.25E+03	0.86%
C-14	8.60E+02	1.42E+02	8.60E+02	0.19%	3.94E+02	8.37E+01	3.94E+02	0.02%	1.39E+02	6.93E+01	1.39E+02	0.04%
Co-57	0.00E+00	4.41E+01	4.41E+01	0.01%	0.00E+00	1.14E+02	1.14E+02	0.00%	1.38E+01	4.27E+01	4.27E+01	0.01%
Co-60	6.08E+03	2.03E+01	6.08E+03	1.35%	5.16E+04	5.16E+01	5.16E+04	2.19%	2.01E+04	3.13E+01	2.01E+04	5.31%
Cm-242	4.12E-01	3.09E-01	4.12E-01	0.00%	5.64E-01	2.11E-01	5.64E-01	0.00%	1.51E+00	2.32E+01	2.32E+01	0.01%
Cm-243/244	1.93E+02	8.41E-01	1.93E+02	0.04%	5.07E+01	8.46E-01	5.07E+01	0.00%	3.05E+01	2.53E+01	3.05E+01	0.01%
Cs-134	-3.15E+00	4.72E+01	4.72E+01	0.01%	9.78E+00	1.17E+02	1.17E+02	0.00%	1.41E+01	5.03E+01	5.03E+01	0.01%
Cs-137	1.09E+05	5.49E+01	1.09E+05	24.21%	8.03E+05	1.25E+02	8.03E+05	34.12%	1.09E+05	6.47E+01	1.09E+05	28.81%
Eu-154	0.00E+00	7.95E+01	7.95E+01	0.02%	1.18E+03	1.44E+02	1.18E+03	0.05%	4.07E+02	7.91E+01	4.07E+02	0.11%
Fe-55	2.36E+03	3.70E+03	3.70E+03	0.82%	1.05E+04	4.28E+03	1.05E+04	0.45%	2.62E+03	9.04E+02	2.62E+03	0.69%
H-3	1.63E+05	6.91E+02	1.63E+05	36.20%	5.43E+04	4.01E+02	5.43E+04	2.31%	1.09E+04	5.33E+02	1.09E+04	2.88%
I-129	-3.79E-01	2.14E+01	2.14E+01	0.00%	0.00E+00	3.33E+01	3.33E+01	0.00%	0.00E+00	3.82E+01	3.82E+01	0.01%
Na-22	7.14E+01	1.78E+01	7.14E+01	0.02%	0.00E+00	7.17E+01	7.17E+01	0.00%	0.00E+00	4.01E+01	4.01E+01	0.01%
Nb-94	8.38E+01	2.30E+01	8.38E+01	0.02%	6.66E+01	7.08E+01	7.08E+01	0.00%	2.79E+01	3.64E+01	3.64E+01	0.01%
Ni-59	0.00E+00	2.66E+02	2.66E+02	0.06%	2.21E+03	2.87E+02	2.21E+03	0.09%	5.53E+02	2.10E+02	5.53E+02	0.15%
Ni-63	4.05E+04	1.94E+03	4.05E+04	9.00%	1.66E+05	7.78E+03	1.66E+05	7.05%	8.34E+04	3.93E+03	8.34E+04	22.05%
Np-237	6.26E-01	5.89E-01	6.26E-01	0.00%	1.01E+00	5.95E-01	1.01E+00	0.00%	8.98E-02	7.85E-01	7.85E-01	0.00%
Pu-238	1.63E+02	3.70E+00	1.63E+02	0.04%	9.49E+02	4.78E+00	9.49E+02	0.04%	8.75E+02	4.18E+01	8.75E+02	0.23%
Pu-239/240	3.91E+02	1.37E+00	3.91E+02	0.09%	3.01E+03	1.99E+00	3.01E+03	0.13%	2.01E+03	2.37E+01	2.01E+03	0.53%
Pu-241	1.82E+03	2.05E+02	1.82E+03	0.40%	7.17E+03	1.11E+02	7.17E+03	0.30%	1.64E+04	1.89E+02	1.64E+04	4.34%
Pu-242	1.79E+01	3.17E+00	1.79E+01	0.00%	3.40E+01	1.99E+00	3.40E+01	0.00%	2.97E+01	4.17E+01	4.17E+01	0.01%
Sr-89	6.70E+02	2.36E+02	6.70E+02	0.15%	-1.96E+05	2.04E+02	2.04E+02	0.01%	-1.97E+04	2.78E+02	2.78E+02	0.07%
Sr-90	1.22E+05	3.47E+02	1.22E+05	27.10%	1.25E+06	2.72E+02	1.25E+06	53.12%	1.15E+05	3.29E+02	1.15E+05	30.40%
Tc-99	7.54E+01	1.08E+02	1.08E+02	0.02%	-4.11E+00	6.17E+01	6.17E+01	0.00%	1.30E+04	1.04E+02	1.30E+04	3.44%
U-233/234	7.82E+02	1.02E+00	7.82E+02	0.17%	1.05E+03	6.27E-01	1.05E+03	0.04%	5.43E+01	8.26E-01	5.43E+01	0.01%
U-235/236	4.09E+01	1.42E+00	4.09E+01	0.01%	5.52E+01	6.29E-01	5.52E+01	0.00%	3.03E+00	6.62E-01	3.03E+00	0.00%
U-238	1.33E+01	1.14E+00	1.33E+01	0.00%	3.11E+01	2.46E-01	3.11E+01	0.00%	2.50E+00	9.53E-01	2.50E+00	0.00%
			4.50E+05	100.00%			2.35E+06	100.00%			3.78E+05	100.00%

	Hot Cell #3 Surface Smear (pCi/filter)				Hot Cell #4 Surface Smear (pCi/filter)				Hot Cell #5 Surface Smear (pCi/filter)			
	Results	MDA	Used	Distribution	Results	MDA	Used	Distribution	Results	MDA	Used	Distribution
Am-241	5.26E+01	8.73E-01	5.26E+01	0.45%	3.31E+01	2.42E-01	3.31E+01	0.19%	2.99E+01	2.48E-01	2.99E+01	0.11%
C-14	9.95E+00	3.55E+01	3.55E+01	0.31%	-1.08E+01	5.84E+01	5.84E+01	0.33%	-8.55E+00	5.48E+01	5.48E+01	0.21%
Co-57	6.00E+00	7.42E+00	7.42E+00	0.06%	9.09E-01	9.59E+00	9.59E+00	0.05%	1.27E+01	1.50E+01	1.50E+01	0.06%
Co-60	3.87E+02	8.70E+00	3.87E+02	3.33%	2.70E+02	5.70E+00	2.70E+02	1.54%	1.53E+02	9.69E+00	1.53E+02	0.58%
Cm-242	0.00E+00	3.92E-01	3.92E-01	0.00%	9.57E-02	2.87E-01	2.87E-01	0.00%	-1.16E-08	7.47E-01	7.47E-01	0.00%
Cm-243/244	2.06E+02	3.43E-01	2.06E+02	1.78%	1.46E+00	2.43E-01	1.46E+00	0.01%	9.96E-01	7.95E-01	9.96E-01	0.00%
Cs-134	3.86E-02	1.00E+01	1.00E+01	0.09%	-3.80E+00	9.62E+00	9.62E+00	0.05%	3.63E+00	1.82E+01	1.82E+01	0.07%
Cs-137	3.57E+03	9.55E+00	3.57E+03	30.76%	5.87E+03	1.17E+01	5.87E+03	33.53%	1.75E+04	1.70E+01	1.75E+04	66.42%
Eu-154	5.35E+00	2.59E+01	2.59E+01	0.22%	1.76E+00	1.69E+01	1.69E+01	0.10%	2.62E+00	2.75E+01	2.75E+01	0.10%
Fe-55	4.50E+02	9.34E+02	9.34E+02	8.05%	6.54E+02	7.55E+02	7.55E+02	4.31%	6.06E+02	7.52E+02	7.52E+02	2.85%
H-3	1.71E+01	2.26E+02	2.26E+02	1.95%	6.17E+02	4.37E+02	6.17E+02	3.52%	3.32E+01	3.17E+02	3.17E+02	1.20%
I-129	N/A	N/A	0	0.00%	-1.39E+00	1.53E+01	1.53E+01	0.09%	2.12E+00	7.17E-01	2.12E+00	0.01%
Na-22	1.89E+00	9.30E+00	9.30E+00	0.08%	6.47E-01	6.11E+00	6.11E+00	0.03%	9.62E-01	9.96E+00	9.96E+00	0.04%
Nb-94	5.04E+00	9.15E+00	9.15E+00	0.08%	-3.24E+00	5.23E+00	5.23E+00	0.03%	-1.25E+00	7.94E+00	7.94E+00	0.03%
Ni-59	N/A	N/A	0	0.00%	7.29E+01	2.03E+02	2.03E+02	1.16%	1.02E+02	6.47E+00	1.02E+02	0.39%
Ni-63	2.78E+03	4.33E+02	2.78E+03	23.95%	4.32E+03	4.54E+02	4.32E+03	24.67%	9.00E+02	2.53E+02	9.00E+02	3.42%
Np-237	5.08E-02	7.78E-01	7.78E-01	0.01%	-1.41E-01	8.17E-01	8.17E-01	0.00%	-1.46E-01	2.41E+00	2.41E+00	0.01%
Pu-238	1.29E+01	2.48E+00	1.29E+01	0.11%	7.28E+01	5.17E+00	7.28E+01	0.42%	3.39E+01	1.16E+00	3.39E+01	0.13%
Pu-239/240	2.58E+01	2.10E+00	2.58E+01	0.22%	2.28E+01	3.04E+00	2.28E+01	0.13%	2.08E+01	9.60E+00	2.08E+01	0.08%
Pu-241	3.35E+02	2.01E+02	3.35E+02	2.89%	2.68E+02	1.55E+02	2.68E+02	1.53%	2.53E+02	1.87E+02	2.53E+02	0.96%
Pu-242	2.20E+00	2.48E+00	2.48E+00	0.02%	5.08E-01	3.69E+00	3.69E+00	0.02%	2.33E+00	1.90E+02	1.90E+02	0.72%
Sr-89	6.91E+02	3.21E+02	6.91E+02	5.95%	-9.25E+02	2.13E+02	2.13E+02	1.22%	-3.70E+02	2.44E+02	2.44E+02	0.93%
Sr-90	2.24E+03	3.67E+02	2.24E+03	19.30%	4.70E+03	3.00E+02	4.70E+03	26.84%	5.66E+03	3.56E+02	5.66E+03	21.48%
Tc-99	1.88E+01	3.80E+01	3.80E+01	0.33%	1.18E+01	3.36E+01	3.36E+01	0.19%	-1.15E+01	4.90E+01	4.90E+01	0.19%
U-233/234	3.85E+00	1.61E+00	3.85E+00	0.03%	1.74E+00	8.34E-01	1.74E+00	0.01%	3.03E+00	2.84E-01	3.03E+00	0.01%
U-235/236	2.41E-01	9.23E-01	9.23E-01	0.01%	5.21E-08	8.37E-01	8.37E-01	0.00%	9.51E-02	7.27E-01	7.27E-01	0.00%
U-238	1.20E-01	1.15E+00	1.15E+00	0.01%	1.74E-01	2.61E-01	2.61E-01	0.00%	3.79E-01	2.84E-01	3.79E-01	0.00%
			1.16E+04	100.00%			1.75E+04	100.00%			2.63E+04	100.00%

	Hot Cell #6 Surface Smear (pCi/filter)				Hot Cell #7 Surface Smear (pCi/filter)					MEAN (pCi/filter)	MEAN (%)	STD DEV
	Results	MDA	Used	Distribution	Results	MDA	Used	Distribution				
Am-241	5.63E+01	8.58E-01	5.63E+01	0.04%	4.52E+01	2.70E-01	4.52E+01	0.09%	Am-241	9.82E+02	0.19%	0.23%
C-14	1.72E+02	5.77E+01	1.72E+02	0.13%	-3.30E+01	4.91E+01	4.91E+01	0.10%	C-14	2.96E+02	0.20%	0.28%
Co-57	3.36E+01	2.74E+01	3.36E+01	0.02%	-6.57E+00	2.23E+01	2.23E+01	0.04%	Co-57	4.40E+01	0.03%	0.02%
Co-60	1.44E+03	9.69E+00	1.44E+03	1.05%	5.30E+02	9.30E+00	5.30E+02	1.03%	Co-60	2.83E+04	2.38%	1.82%
Cm-242	-1.58E-08	1.10E+00	1.10E+00	0.00%	2.12E-01	8.11E-01	8.11E-01	0.00%	Cm-242	2.84E+00	0.00%	0.00%
Cm-243/244	1.01E+00	1.08E+00	1.08E+00	0.00%	1.08E+00	1.21E+00	1.21E+00	0.00%	Cm-243/244	5.57E+01	0.13%	0.47%
Cs-134	-1.16E+01	3.06E+01	3.06E+01	0.02%	9.06E+00	2.73E+01	2.73E+01	0.05%	Cs-134	6.93E+01	0.03%	0.03%
Cs-137	8.19E+04	2.75E+01	8.19E+04	59.82%	3.95E+04	2.40E+01	3.95E+04	76.81%	Cs-137	1.98E+05	43.69%	22.68%
Eu-154	0.00E+00	4.01E+01	4.01E+01	0.03%	1.31E+01	3.46E+01	3.46E+01	0.07%	Eu-154	3.04E+02	0.08%	0.06%
Fe-55	3.48E+03	8.54E+03	8.54E+03	6.24%	4.03E+02	8.20E+02	8.20E+02	1.59%	Fe-55	1.59E+04	2.75%	2.29%
H-3	4.47E+02	2.44E+02	4.47E+02	0.33%	6.81E+02	2.44E+02	6.81E+02	1.32%	H-3	6.76E+04	8.29%	15.26%
I-129	-3.23E+00	2.07E+01	2.07E+01	0.02%	5.41E-02	1.11E+01	1.11E+01	0.02%	I-129	1.85E+01	0.02%	0.03%
Na-22	1.69E+01	9.79E+00	1.69E+01	0.01%	4.74E+00	1.22E+01	1.22E+01	0.02%	Na-22	4.32E+01	0.03%	0.02%
Nb-94	2.13E+01	1.25E+01	2.13E+01	0.02%	4.42E-01	1.04E+01	1.04E+01	0.02%	Nb-94	3.88E+03	0.12%	0.28%
Ni-59	1.35E+02	2.61E+02	2.61E+02	0.19%	1.67E+02	2.36E+02	2.36E+02	0.46%	Ni-59	8.60E+02	0.33%	0.35%
Ni-63	5.44E+03	5.49E+02	5.44E+03	3.97%	2.80E+03	4.18E+02	2.80E+03	5.44%	Ni-63	1.67E+05	13.39%	10.41%
Np-237	2.56E-01	6.31E-01	6.31E-01	0.00%	1.53E-01	6.28E-01	6.28E-01	0.00%	Np-237	7.89E-01	0.00%	0.00%
Pu-238	4.53E+01	7.75E+00	4.53E+01	0.03%	1.23E+01	2.05E+00	1.23E+01	0.02%	Pu-238	4.70E+02	0.11%	0.11%
Pu-239/240	1.32E+02	1.35E+00	1.32E+02	0.10%	3.07E+01	1.17E+00	3.07E+01	0.06%	Pu-239/240	7.64E+02	0.13%	0.13%
Pu-241	4.47E+02	2.02E+02	4.47E+02	0.33%	3.32E+02	2.76E+02	3.32E+02	0.65%	Pu-241	4.86E+03	1.19%	1.22%
Pu-242	8.98E+00	1.35E+00	8.98E+00	0.01%	2.80E-01	2.70E+00	2.70E+00	0.01%	Pu-242	1.26E+01	0.06%	0.19%
Sr-89	-5.97E+03	2.64E+02	2.64E+02	0.19%	-6.23E+02	3.01E+02	3.01E+02	0.59%	Sr-89	3.18E+02	0.81%	1.54%
Sr-90	3.75E+04	2.89E+02	3.75E+04	27.39%	5.91E+03	2.95E+02	5.91E+03	11.49%	Sr-90	1.98E+05	25.43%	11.76%
Tc-99	3.44E+01	4.27E+01	4.27E+01	0.03%	1.81E+01	4.58E+01	4.58E+01	0.09%	Tc-99	1.40E+04	0.58%	1.23%
U-233/234	3.91E+01	8.38E-01	3.91E+01	0.03%	7.59E+00	1.26E+00	7.59E+00	0.01%	U-233/234	2.07E+02	0.03%	0.04%
U-235/236	2.97E+00	8.41E-01	2.97E+00	0.00%	4.11E-01	7.87E-01	7.87E-01	0.00%	U-235/236	1.18E+01	0.00%	0.00%
U-238	1.42E+00	1.05E+00	1.42E+00	0.00%	1.03E-01	9.82E-01	9.82E-01	0.00%	U-238	5.21E+00	0.00%	0.00%
			1.37E+05	100.00%			5.14E+04	100.00%			100.00%	

Units for sample concentrations are presented in pCi/filter. Filter in this context is defined as a standard smear sample take over a 100cm2 area.

BALANCE OF PLANT

	Quad A Smear (pCi/filter)				Quad C Smear (pCi/filter)				Canal E Smear (pCi/filter)			
	Results	MDA	Used	Distribution	Results	MDA	Used	Distribution	Results	MDA	Used	Distribution
Ag-108m	5.63E+01	7.24E+00	5.63E+01	0.06%	4.44E+01	7.67E+00	4.44E+01	0.07%	1.98E+02	9.21E+00	1.98E+02	0.22%
Am-241	1.43E+00	1.02E+00	1.43E+00	0.00%	1.62E+00	8.09E-01	1.62E+00	0.00%	3.48E+00	3.60E-01	3.48E+00	0.00%
C-14	1.08E+03	4.47E+01	1.08E+03	1.08%	7.60E+02	4.89E+01	7.60E+02	1.20%	7.92E+02	4.42E+01	7.92E+02	0.87%
Co-60	3.78E+03	7.07E+00	3.78E+03	3.78%	4.50E+03	7.40E+00	4.50E+03	7.10%	7.61E+03	9.32E+00	7.61E+03	8.36%
Cm-243/244	1.70E+01	1.28E+00	1.70E+01	0.02%	2.18E+01	2.80E-01	2.18E+01	0.03%	1.79E+01	3.62E-01	1.79E+01	0.02%
Cm-245/246	9.73E-01	7.22E-01	9.73E-01	0.00%	1.40E+00	3.23E-01	1.40E+00	0.00%	2.23E+00	4.18E-01	2.23E+00	0.00%
Cs-137	1.22E+02	9.49E+00	1.22E+02	0.12%	7.44E+01	1.02E+01	7.44E+01	0.12%	1.44E+02	1.23E+01	1.44E+02	0.16%
Eu-152	4.37E+01	2.01E+01	4.37E+01	0.04%	5.17E+01	2.11E+01	5.17E+01	0.08%	6.52E+01	2.58E+01	6.52E+01	0.07%
Eu-154	0.00E+00	2.31E+01	2.31E+01	0.02%	0.00E+00	2.63E+01	2.63E+01	0.04%	0.00E+00	2.77E+01	2.77E+01	0.03%
Fe-55	8.58E+02	3.79E+01	8.58E+02	0.86%	9.00E+02	3.80E+01	9.00E+02	1.42%	8.08E+02	3.79E+01	8.08E+02	0.89%
H-3	8.07E+04	5.22E+02	8.07E+04	80.79%	3.90E+04	3.57E+02	3.90E+04	61.57%	4.81E+04	4.14E+02	4.81E+04	52.82%
I-129	5.06E+00	1.57E+01	1.57E+01	0.02%	3.62E+00	1.35E+01	1.35E+01	0.02%	3.74E+00	1.88E+01	1.88E+01	0.02%
Nb-94	2.29E+00	8.66E+00	8.66E+00	0.01%	-6.07E-01	9.26E+00	9.26E+00	0.01%	1.14E+00	1.11E+01	1.11E+01	0.01%
Ni-59	2.20E+02	4.46E+01	2.20E+02	0.22%	2.19E+02	6.56E+01	2.19E+02	0.35%	2.58E+02	7.98E+01	2.58E+02	0.28%
Ni-63	1.28E+04	8.64E+01	1.28E+04	12.81%	1.76E+04	9.97E+01	1.76E+04	27.79%	3.28E+04	1.30E+02	3.28E+04	36.02%
Pu-238	2.92E+00	6.23E-01	2.92E+00	0.00%	1.74E+00	1.18E+00	1.74E+00	0.00%	3.68E+00	1.64E+00	3.68E+00	0.00%
Pu-239/240	1.28E+00	9.49E-01	1.28E+00	0.00%	7.24E-01	7.03E-01	7.24E-01	0.00%	1.84E+00	7.07E-01	1.84E+00	0.00%
Pu-241	1.02E+01	2.64E+01	2.64E+01	0.03%	5.87E+00	2.50E+01	2.50E+01	0.04%	2.13E+01	2.82E+01	2.82E+01	0.03%
Sr-89	1.39E+01	8.86E+00	1.39E+01	0.01%	7.22E+00	1.46E+01	1.46E+01	0.02%	-1.38E+01	1.18E+01	1.18E+01	0.01%
Sr-90	7.93E+01	8.56E+00	7.93E+01	0.08%	4.27E+01	9.20E+00	4.27E+01	0.07%	1.02E+02	8.25E+00	1.02E+02	0.11%
Tc-99	3.20E+01	3.04E+01	3.20E+01	0.03%	3.16E+01	3.02E+01	3.16E+01	0.05%	5.91E+01	4.30E+01	5.91E+01	0.06%
U-233/234	1.94E-01	9.43E-01	9.43E-01	0.00%	7.96E-01	7.62E-01	7.96E-01	0.00%	4.65E-01	8.95E-01	8.95E-01	0.00%
			9.99E+04	100.00%			6.33E+04	100.00%			9.11E+04	100.00%

	Lilly Pad Smear (pCi/filter)				CTMT General Area Smear (pCi/filter)				Rx Building Smear (pCi/filter)			
	Results	MDA	Used	Distribution	Results	MDA	Used	Distribution	Results	MDA	Used	Distribution
Ag-108m	4.70E+00	3.63E+00	4.70E+00	0.05%	8.69E+01	7.47E+00	8.69E+01	0.03%	N/A	N/A	0	0.00%
Am-241	6.25E-01	7.17E-01	7.17E-01	0.01%	3.61E+00	7.24E-01	3.61E+00	0.00%	7.84E+01	1.47E+01	7.84E+01	0.42%
C-14	5.30E+01	2.38E+01	5.30E+01	0.59%	2.90E+02	4.53E+01	2.90E+02	0.11%	2.09E+01	1.37E+01	2.09E+01	0.11%
Co-60	2.53E+02	4.03E+00	2.53E+02	2.81%	3.57E+03	6.77E+00	3.57E+03	1.36%	2.38E+02	8.51E+00	2.38E+02	1.29%
Cm-243/244	2.05E+00	8.75E-01	2.05E+00	0.02%	4.71E+01	8.82E-01	4.71E+01	0.02%	2.39E+00	4.02E-01	2.39E+00	0.01%
Cm-245/246	6.60E-01	3.96E-01	6.60E-01	0.01%	9.33E-01	4.00E-01	9.33E-01	0.00%	N/A	N/A	0	0.00%
Cs-137	1.39E+01	4.05E+00	1.39E+01	0.15%	3.64E+02	9.38E+00	3.64E+02	0.14%	4.64E+03	1.02E+01	4.64E+03	25.15%
Eu-152	2.56E+00	1.07E+01	1.07E+01	0.12%	1.40E+01	2.06E+01	2.06E+01	0.01%	6.50E+01	3.70E+01	6.50E+01	0.35%
Eu-154	1.43E+00	1.04E+01	1.04E+01	0.12%	0.00E+00	2.08E+01	2.08E+01	0.01%	7.18E+01	1.75E+01	7.18E+01	0.39%
Fe-55	7.91E+02	3.82E+01	7.91E+02	8.80%	4.43E+03	4.02E+01	4.43E+03	1.68%	-1.59E+01	1.79E+01	1.79E+01	0.10%
H-3	6.42E+03	3.09E+02	6.42E+03	71.40%	2.42E+05	9.07E+02	2.42E+05	91.95%	1.07E+04	2.89E+01	1.07E+04	58.00%
I-129	1.54E+01	2.21E+01	2.21E+01	0.25%	-5.02E+00	1.00E+01	1.00E+01	0.00%	1.02E+01	8.17E+00	1.02E+01	0.06%
Nb-94	8.85E-01	3.91E+00	3.91E+00	0.04%	1.73E+01	8.28E+00	1.73E+01	0.01%	-3.66E-01	9.12E+00	9.12E+00	0.05%
Ni-59	0.00E+00	7.98E+01	7.98E+01	0.89%	9.04E+01	7.67E+01	9.04E+01	0.03%	2.36E+02	2.31E+01	2.36E+02	1.28%
Ni-63	1.24E+03	2.68E+01	1.24E+03	13.79%	1.19E+04	8.27E+01	1.19E+04	4.52%	3.27E+01	6.59E+01	6.59E+01	0.36%
Pu-238	2.24E-01	7.25E-01	7.25E-01	0.01%	6.51E-01	9.05E-01	9.05E-01	0.00%	2.86E+01	3.50E+00	2.86E+01	0.16%
Pu-239/240	4.33E-01	4.14E-01	4.33E-01	0.00%	2.16E+00	1.04E+00	2.16E+00	0.00%	1.48E+01	2.71E+00	1.48E+01	0.08%
Pu-241	2.56E+00	3.08E+01	3.08E+01	0.34%	2.71E+01	2.37E+01	2.71E+01	0.01%	1.78E+02	1.43E+02	1.78E+02	0.96%
Sr-89	-6.02E-01	8.76E+00	8.76E+00	0.10%	2.99E+01	7.18E+00	2.99E+01	0.01%	N/A	N/A	0	0.00%
Sr-90	9.77E+00	8.11E+00	9.77E+00	0.11%	2.42E+02	8.64E+00	2.42E+02	0.09%	2.04E+03	1.44E+01	2.04E+03	11.06%
Tc-99	1.02E+01	3.39E+01	3.39E+01	0.38%	9.06E+00	3.36E+01	3.36E+01	0.01%	0.00E+00	2.81E+01	2.81E+01	0.15%
U-233/234	3.14E-01	1.01E+00	1.01E+00	0.01%	3.73E-01	9.00E-01	9.00E-01	0.00%	4.38E+00	4.43E+00	4.43E+00	0.02%
			8.99E+03	100.00%			2.63E+05	100.00%			1.84E+04	100.00%

	Rx Building Smear Duplicate (pCi/filter)					MEAN	MEAN	STD DEV
	Results	MDA	Used	Distribution		(pCi/filter)	(%)	
Ag-108m	N/A	N/A	0	0.00%	Ag-108m	5.58E+01	0.06%	0.07%
Am-241	1.01E+02	1.55E+01	1.01E+02	0.47%	Am-241	2.72E+01	0.13%	0.22%
C-14	2.09E+01	1.37E+01	2.09E+01	0.10%	C-14	4.31E+02	0.58%	0.48%
Co-60	2.53E+03	7.07E+00	2.53E+03	11.85%	Co-60	3.21E+03	5.22%	3.99%
Cm-243/244	2.31E+00	7.91E-01	2.31E+00	0.01%	Cm-243/244	1.58E+01	0.02%	0.01%
Cm-245/246	N/A	N/A	0	0.00%	Cm-245/246	8.85E-01	0.00%	0.00%
Cs-137	5.63E+03	1.01E+01	5.63E+03	26.36%	Cs-137	1.57E+03	7.46%	12.50%
Eu-152	3.29E+01	4.62E+01	4.62E+01	0.22%	Eu-152	4.33E+01	0.13%	0.12%
Eu-154	9.62E+01	1.59E+01	9.62E+01	0.45%	Eu-154	3.95E+01	0.15%	0.19%
Fe-55	-9.63E+00	2.00E+01	2.00E+01	0.09%	Fe-55	1.12E+03	1.98%	3.07%
H-3	1.05E+04	2.84E+01	1.05E+04	49.16%	H-3	6.25E+04	66.53%	15.60%
I-129	1.94E+01	1.00E+01	1.94E+01	0.09%	I-129	1.57E+01	0.06%	0.09%
Nb-94	-1.29E+00	8.60E+00	8.60E+00	0.04%	Nb-94	9.71E+00	0.03%	0.02%
Ni-59	-1.65E+01	2.03E+01	2.03E+01	0.10%	Ni-59	1.61E+02	0.45%	0.46%
Ni-63	6.79E+01	6.83E+01	6.83E+01	0.32%	Ni-63	1.09E+04	13.66%	13.78%
Pu-238	2.86E+01	3.50E+00	2.86E+01	0.13%	Pu-238	9.60E+00	0.04%	0.07%
Pu-239/240	1.48E+01	2.71E+00	1.48E+01	0.07%	Pu-239/240	5.15E+00	0.02%	0.04%
Pu-241	1.78E+02	1.43E+02	1.78E+02	0.83%	Pu-241	7.05E+01	0.32%	0.41%
Sr-89	N/A	N/A	0	0.00%	Sr-89	1.13E+01	0.03%	0.03%
Sr-90	2.04E+03	1.44E+01	2.04E+03	9.55%	Sr-90	6.51E+02	3.01%	3.80%
Tc-99	-1.21E+01	2.81E+01	2.81E+01	0.13%	Tc-99	3.52E+01	0.12%	0.13%
U-233/234	4.38E+00	4.43E+00	4.43E+00	0.02%	U-233/234	1.91E+00	0.01%	0.01%
			2.14E+04	100.00%			100.00%	

Units for sample concentrations are presented in pCi/filter. Filter in this context is defined as a standard smear sample take over a 100cm2 area.

Reactor Operations & Laboratory Building

	ROLB Smear (pCi/filter)				ROLB Smear Duplicate (pCi/filter)				ROLB Smear 2 (pCi/filter)			
	Results	MDA	Used	Distribution	Results	MDA	Used	Distribution	Results	MDA	Used	Distribution
Am-241	1.82E+00	1.64E+00	1.82E+00	0.01%	1.82E+00	1.64E+00	1.82E+00	0.01%	6.07E+00	1.70E+00	6.07E+00	0.03%
C-14	1.55E+01	1.53E+01	1.55E+01	0.06%	1.05E+01	1.03E+01	1.05E+01	0.04%	-4.68E+01	8.61E+01	8.61E+01	0.47%
Co-60	4.09E+02	1.16E+01	4.09E+02	1.45%	4.09E+02	1.16E+01	4.09E+02	1.45%	8.90E+01	8.81E+00	8.90E+01	0.48%
Cm-242	-2.54E-01	3.27E+00	3.27E+00	0.01%	-2.54E-01	3.27E+00	3.27E+00	0.01%	8.22E-01	1.53E+00	1.53E+00	0.01%
Cm-243/244	3.04E+00	1.64E+00	3.04E+00	0.01%	3.04E+00	1.64E+00	3.04E+00	0.01%	5.60E-01	2.09E+00	2.09E+00	0.01%
Cs-137	4.77E+03	1.37E+01	4.77E+03	16.96%	4.77E+03	1.37E+01	4.77E+03	16.96%	2.97E+03	1.14E+01	2.97E+03	16.18%
Eu-155	1.26E+01	1.86E+01	1.86E+01	0.07%	1.26E+01	1.86E+01	1.86E+01	0.07%	1.46E+02	3.23E+01	3.23E+01	0.18%
H-3	2.08E+04	5.30E+01	2.08E+04	73.93%	2.08E+04	5.30E+01	2.08E+04	73.96%	-4.98E+02	6.84E+02	6.84E+02	3.73%
I-129	1.67E+01	1.20E+01	1.67E+01	0.06%	1.67E+01	1.20E+01	1.67E+01	0.06%	9.63E+02	1.04E+01	9.63E+02	5.24%
Nb-94	6.74E+00	1.41E+01	1.41E+01	0.05%	6.74E+00	1.41E+01	1.41E+01	0.05%	1.91E+02	8.11E+00	8.11E+00	0.04%
Ni-59	5.16E+01	1.95E+02	1.95E+02	0.69%	5.16E+01	1.95E+02	1.95E+02	0.69%	-4.30E+02	4.71E+02	4.71E+02	2.56%
Ni-63	3.13E+01	6.30E+01	6.30E+01	0.22%	3.13E+01	6.30E+01	6.30E+01	0.22%	1.70E+02	4.47E+01	4.47E+01	0.24%
Np-237	4.93E+00	1.00E+01	1.00E+01	0.04%	7.94E-01	4.43E+00	4.43E+00	0.02%	3.65E+00	1.74E+01	1.74E+01	0.09%
Pu-239/240	5.64E+00	1.95E+00	5.64E+00	0.02%	1.08E+01	3.19E+00	1.08E+01	0.04%	1.88E+00	1.53E+00	1.88E+00	0.01%
Pu-241	5.88E+01	9.47E+01	9.47E+01	0.34%	9.32E+01	1.50E+02	1.50E+02	0.53%	8.80E+01	7.57E+01	7.57E+01	0.41%
Sb-125	-1.24E+00	5.26E+01	5.26E+01	0.19%	-1.24E+00	5.26E+01	5.26E+01	0.19%	5.92E+00	4.83E+01	4.83E+01	0.26%
Sr-90	1.53E+03	1.48E+01	1.53E+03	5.44%	1.48E+03	1.39E+01	1.48E+03	5.26%	4.81E+02	1.23E+01	4.81E+02	2.62%
Tc-99	5.96E-01	2.80E+01	2.80E+01	0.10%	5.96E-01	2.80E+01	2.80E+01	0.10%	9.04E+01	8.89E+01	8.89E+01	0.48%
U-233/234	9.15E+01	3.97E+00	9.15E+01	0.33%	8.52E+01	1.81E+00	8.52E+01	0.30%	1.18E+04	4.93E+00	1.18E+04	64.02%
U-235/236	5.82E+00	2.84E+00	5.82E+00	0.02%	4.42E+00	2.24E+00	4.42E+00	0.02%	3.94E+02	3.35E+00	3.94E+02	2.14%
U-238	4.81E+00	2.85E+00	4.81E+00	0.02%	4.46E+00	2.18E+00	4.46E+00	0.02%	1.42E+02	2.71E+00	1.42E+02	0.77%
			2.81E+04	100.00%			2.81E+04	100.00%			1.84E+04	100%

	ROLB Smear 2 Duplicate (pCi/filter)					MEAN (pCi/filter)	MEAN (%)	STD DEV
	Results	MDA	Used	Distribution				
Am-241	2.35E+00	2.90E+00	2.90E+00	0.02%	Am-241	3.15E+00	0.02%	0.01%
C-14	-2.04E+01	8.51E+01	8.51E+01	0.48%	C-14	4.93E+01	0.26%	0.25%
Co-60	9.58E+01	7.77E+00	9.58E+01	0.54%	Co-60	2.51E+02	0.98%	0.54%
Cm-242	-6.70E-03	2.23E+00	2.23E+00	0.01%	Cm-242	2.58E+00	0.01%	0.00%
Cm-243/244	6.50E-01	2.11E+00	2.11E+00	0.01%	Cm-243/244	2.57E+00	0.01%	0.00%
Cs-137	2.90E+03	1.17E+01	2.90E+03	16.40%	Cs-137	3.85E+03	16.62%	0.40%
Eu-155	2.77E+01	3.18E+01	3.18E+01	0.18%	Eu-155	2.53E+01	0.12%	0.06%
H-3	-4.15E+02	6.85E+02	6.85E+02	3.87%	H-3	1.07E+04	38.87%	40.50%
I-129	9.32E+02	1.05E+01	9.32E+02	5.27%	I-129	4.82E+02	2.66%	3.00%
Nb-94	1.94E+02	7.77E+00	7.77E+00	0.04%	Nb-94	1.10E+01	0.05%	0.00%
Ni-59	4.21E+01	4.93E+02	4.93E+02	2.79%	Ni-59	3.38E+02	1.68%	1.15%
Ni-63	1.68E+02	4.36E+01	4.36E+01	0.25%	Ni-63	5.36E+01	0.23%	0.01%
Np-237	-1.58E+00	8.72E+00	8.72E+00	0.05%	Np-237	1.01E+01	0.05%	0.03%
Pu-239/240	2.00E+00	9.05E-01	2.00E+00	0.01%	Pu-239/240	5.08E+00	0.02%	0.01%
Pu-241	5.34E+01	9.19E+01	9.19E+01	0.52%	Pu-241	1.03E+02	0.45%	0.09%
Sb-125	-5.72E+00	4.69E+01	4.69E+01	0.27%	Sb-125	5.01E+01	0.23%	0.04%
Sr-90	4.97E+02	1.26E+01	4.97E+02	2.81%	Sr-90	9.97E+02	4.03%	1.53%
Tc-99	4.51E+01	8.87E+01	8.87E+01	0.50%	Tc-99	5.84E+01	0.30%	0.23%
U-233/234	1.11E+04	5.04E+00	1.11E+04	62.82%	U-233/234	5.76E+03	31.87%	36.44%
U-235/236	4.08E+02	3.28E+00	4.08E+02	2.30%	U-235/236	2.03E+02	1.12%	1.27%
U-238	1.52E+02	4.58E+00	1.52E+02	0.86%	U-238	7.58E+01	0.42%	0.46%
			1.77E+04	100%			100.00%	

Units for sample concentrations are presented in pCi/filter. Filter in this context is defined as a standard smear sample take over a 100cm2 area.

HOT LABORATORY

	Hot Cell Equipment #1 Smear (pCi/filter)				Hot Cell Equipment #2 Smear (pCi/filter)				Hot Cell Equipment #3 Smear (pCi/filter)			
	Results	MDA	Used	Distribution	Results	MDA	Used	Distribution	Results	MDA	Used	Distribution
Co-60	2.74E+05	1.24E+02	2.74E+05	10.81%	8.64E+03	2.25E+01	8.64E+03	2.16%	2.67E+03	1.27E+01	2.67E+03	2.78%
Cs-137	8.07E+05	2.06E+02	8.07E+05	31.82%	2.71E+05	6.98E+01	2.71E+05	67.85%	4.51E+04	3.22E+01	4.51E+04	46.98%
Eu-154	1.79E+03	3.69E+02	1.79E+03	0.07%	0.00E+00	8.27E+01	8.27E+01	0.02%	1.94E+02	7.49E+01	1.94E+02	0.20%
H-3	6.26E+05	3.49E+02	6.26E+05	24.69%	4.69E+03	2.53E+02	4.69E+03	1.17%	1.73E+03	4.51E+02	1.73E+03	1.80%
Sr-90	8.27E+05	3.49E+02	8.27E+05	32.61%	1.15E+05	3.50E+02	1.15E+05	28.79%	4.63E+04	3.65E+02	4.63E+04	48.23%
			2.54E+06	100.00%			3.99E+05	100.00%			9.60E+04	100.00%

	Hot Cell Equipment #4 Smear (pCi/filter)				Hot Cell Equipment #5 Smear (pCi/filter)				Hot Cell Equipment #6 Smear (pCi/filter)			
	Results	MDA	Used	Distribution	Results	MDA	Used	Distribution	Results	MDA	Used	Distribution
Co-60	1.58E+03	1.23E+01	1.58E+03	6.61%	3.23E+02	7.08E+00	3.23E+02	0.10%	4.91E+02	7.50E+00	4.91E+02	2.22%
Cs-137	3.99E+03	1.61E+01	3.99E+03	16.70%	2.85E+05	6.04E+01	2.85E+05	87.96%	1.16E+04	1.47E+01	1.16E+04	52.52%
Eu-154	2.64E+01	3.99E+01	3.99E+01	0.17%	0.00E+00	3.04E+01	3.04E+01	0.01%	0.00E+00	3.11E+01	3.11E+01	0.14%
H-3	1.51E+04	3.94E+02	1.51E+04	63.21%	7.61E+01	2.70E+02	2.70E+02	0.08%	1.95E+02	2.63E+02	2.63E+02	1.19%
Sr-90	3.18E+03	3.94E+02	3.18E+03	13.31%	3.84E+04	2.87E+02	3.84E+04	11.85%	9.70E+03	3.54E+02	9.70E+03	43.92%
			2.39E+04	100.00%			3.24E+05	100.00%			2.21E+04	100.00%

	Hot Cell Equipment #7 Smear (pCi/filter)				Hot Cell #1 Surface Smear (pCi/filter)				Hot Cell #2 Surface Smear (pCi/filter)			
	Results	MDA	Used	Distribution	Results	MDA	Used	Distribution	Results	MDA	Used	Distribution
Co-60	6.08E+03	2.03E+01	6.08E+03	1.52%	5.16E+04	5.16E+01	5.16E+04	2.39%	2.01E+04	3.13E+01	2.01E+04	7.87%
Cs-137	1.09E+05	5.49E+01	1.09E+05	27.24%	8.03E+05	1.25E+02	8.03E+05	37.17%	1.09E+05	6.47E+01	1.09E+05	42.68%
Eu-154	0.00E+00	7.95E+01	7.95E+01	0.02%	1.18E+03	1.44E+02	1.18E+03	0.05%	4.07E+02	7.91E+01	4.07E+02	0.16%
H-3	1.63E+05	6.91E+02	1.63E+05	40.73%	5.43E+04	4.01E+02	5.43E+04	2.51%	1.09E+04	5.33E+02	1.09E+04	4.27%
Sr-90	1.22E+05	3.47E+02	1.22E+05	30.49%	1.25E+06	2.72E+02	1.25E+06	57.87%	1.15E+05	3.29E+02	1.15E+05	45.03%
			4.00E+05	100.00%			2.16E+06	100.00%			2.55E+05	100.00%

	Hot Cell #3 Surface Smear (pCi/filter)				Hot Cell #4 Surface Smear (pCi/filter)				Hot Cell #5 Surface Smear (pCi/filter)			
	Results	MDA	Used	Distribution	Results	MDA	Used	Distribution	Results	MDA	Used	Distribution
Co-60	3.87E+02	8.70E+00	3.87E+02	6.00%	2.70E+02	5.70E+00	2.70E+02	2.35%	1.53E+02	9.69E+00	1.53E+02	0.65%
Cs-137	3.57E+03	9.55E+00	3.57E+03	55.36%	5.87E+03	1.17E+01	5.87E+03	51.16%	1.75E+04	1.70E+01	1.75E+04	73.97%
Eu-154	5.35E+00	2.59E+01	2.59E+01	0.40%	1.76E+00	1.69E+01	1.69E+01	0.15%	2.62E+00	2.75E+01	2.75E+01	0.12%
H-3	1.71E+01	2.26E+02	2.26E+02	3.50%	6.17E+02	4.37E+02	6.17E+02	5.38%	3.32E+01	3.17E+02	3.17E+02	1.34%
Sr-90	2.24E+03	3.67E+02	2.24E+03	34.73%	4.70E+03	3.00E+02	4.70E+03	40.96%	5.66E+03	3.56E+02	5.66E+03	23.92%
			6.45E+03	100.00%			1.15E+04	100.00%			2.37E+04	100.00%

	Hot Cell #6 Surface Smear (pCi/filter)				Hot Cell #7 Surface Smear (pCi/filter)					MEAN (pCi/filter)	MEAN (%)	STD DEV
	Results	MDA	Used	Distribution	Results	MDA	Used	Distribution				
Co-60	1.44E+03	9.69E+00	1.44E+03	1.19%	5.30E+02	9.30E+00	5.30E+02	1.14%	Co-60	2.83E+04	3.41%	3.15%
Cs-137	8.19E+04	2.75E+01	8.19E+04	67.50%	3.95E+04	2.40E+01	3.95E+04	84.66%	Cs-137	1.98E+05	53.11%	21.35%
Eu-154	0.00E+00	4.01E+01	4.01E+01	0.03%	1.31E+01	3.46E+01	3.46E+01	0.07%	Eu-154	3.04E+02	0.12%	0.10%
H-3	4.47E+02	2.44E+02	4.47E+02	0.37%	6.81E+02	2.44E+02	6.81E+02	1.46%	H-3	6.76E+04	10.84%	19.01%
Sr-90	3.75E+04	2.89E+02	3.75E+04	30.91%	5.91E+03	2.95E+02	5.91E+03	12.67%	Sr-90	1.98E+05	32.52%	13.97%
			1.21E+05	100.00%			4.67E+04	100.00%			100.00%	

Units for sample concentrations are presented in pCi/filter. Filter in this context is defined as a standard smear sample take over a 100cm2 area.

BALANCE OF PLANT

Quad A Smear (pCi/filter)	Results	MDA	Used	Distribution
Co-60	3.78E+03	7.07E+00	3.78E+03	4.46%
Cs-137	1.22E+02	9.49E+00	1.22E+02	0.14%
Eu-154	0.00E+00	2.31E+01	2.31E+01	0.03%
H-3	8.07E+04	5.22E+02	8.07E+04	95.25%
I-129	5.06E+00	1.57E+01	1.57E+01	0.02%
Sr-90	7.93E+01	8.56E+00	7.93E+01	0.09%
			8.47E+04	100.00%

Quad C Smear (pCi/filter)	Results	MDA	Used	Distribution
Co-60	4.50E+03	7.40E+00	4.50E+03	10.31%
Cs-137	7.44E+01	1.02E+01	7.44E+01	0.17%
Eu-154	0.00E+00	2.63E+01	2.63E+01	0.06%
H-3	3.90E+04	3.57E+02	3.90E+04	89.33%
I-129	3.62E+00	1.35E+01	1.35E+01	0.03%
Sr-90	4.27E+01	9.20E+00	4.27E+01	0.10%
			4.37E+04	100.00%

Canal E Smear (pCi/filter)	Results	MDA	Used	Distribution
Co-60	7.61E+03	9.32E+00	7.61E+03	13.59%
Cs-137	1.44E+02	1.23E+01	1.44E+02	0.26%
Eu-154	0.00E+00	2.77E+01	2.77E+01	0.05%
H-3	4.81E+04	4.14E+02	4.81E+04	85.89%
I-129	3.74E+00	1.88E+01	1.88E+01	0.03%
Sr-90	1.02E+02	8.25E+00	1.02E+02	0.18%
			5.60E+04	100.00%

Lilly Pad Smear (pCi/filter)	Results	MDA	Used	Distribution
Co-60	2.53E+02	4.03E+00	2.53E+02	3.76%
Cs-137	1.39E+01	4.05E+00	1.39E+01	0.21%
Eu-154	1.43E+00	1.04E+01	1.04E+01	0.15%
H-3	6.42E+03	3.09E+02	6.42E+03	95.41%
I-129	1.54E+01	2.21E+01	2.21E+01	0.33%
Sr-90	9.77E+00	8.11E+00	9.77E+00	0.15%
			6.73E+03	100.00%

CTMT General Area Smear (pCi/filter)	Results	MDA	Used	Distribution
Co-60	3.57E+03	6.77E+00	3.57E+03	1.45%
Cs-137	3.64E+02	9.38E+00	3.64E+02	0.15%
Eu-154	0.00E+00	2.08E+01	2.08E+01	0.01%
H-3	2.42E+05	9.07E+02	2.42E+05	98.29%
I-129	-5.02E+00	1.00E+01	1.00E+01	0.00%
Sr-90	2.42E+02	8.64E+00	2.42E+02	0.10%
			2.46E+05	100.00%

Rx Building Smear (pCi/filter)	Results	MDA	Used	Distribution
Co-60	2.38E+02	8.51E+00	2.38E+02	1.34%
Cs-137	4.64E+03	1.02E+01	4.64E+03	26.21%
Eu-154	7.18E+01	1.75E+01	7.18E+01	0.41%
H-3	1.07E+04	2.89E+01	1.07E+04	60.45%
I-129	1.02E+01	8.17E+00	1.02E+01	0.06%
Sr-90	2.04E+03	1.44E+01	2.04E+03	11.53%
			1.77E+04	100.00%

Rx Building Smear Duplicate (pCi/filter)	Results	MDA	Used	Distribution
Co-60	2.53E+03	7.07E+00	2.53E+03	12.15%
Cs-137	5.63E+03	1.01E+01	5.63E+03	27.05%
Eu-154	9.62E+01	1.59E+01	9.62E+01	0.46%
H-3	1.05E+04	2.84E+01	1.05E+04	50.44%
I-129	1.94E+01	1.00E+01	1.94E+01	0.09%
Sr-90	2.04E+03	1.44E+01	2.04E+03	9.80%
			2.08E+04	100.00%

	MEAN (pCi/filter)	MEAN (%)	STD DEV
Co-60	3.94E+03	6.72%	5.17%
Cs-137	1.44E+02	7.74%	12.91%
Eu-154	3.95E+01	0.17%	0.19%
H-3	6.25E+04	82.15%	18.93%
I-129	1.57E+01	0.08%	0.11%
Sr-90	6.51E+02	3.13%	3.88%
		100.00%	

Units for sample concentrations are presented in pCi/filter. Filter in this context is defined as a standard smear sample take over a 100cm2 area.

Reactor Operations & Laboratory Building

	ROLB Smear (pCi/filter)				ROLB Smear Duplicate (pCi/filter)				ROLB Smear 2 (pCi/filter)			
	Results	MDA	Used	Distribution	Results	MDA	Used	Distribution	Results	MDA	Used	Distribution
Co-60	4.09E+02	1.16E+01	4.09E+02	1.48%	4.09E+02	1.16E+01	4.09E+02	1.46%	8.90E+01	8.81E+00	8.90E+01	0.51%
Cs-137	4.77E+03	1.37E+01	4.77E+03	17.27%	4.77E+03	1.37E+01	4.77E+03	17.30%	2.97E+03	1.14E+01	2.97E+03	17.14%
H-3	2.08E+04	5.30E+01	2.08E+04	75.30%	2.08E+04	5.30E+01	2.08E+04	75.46%	-4.98E+02	6.84E+02	6.84E+02	3.95%
I-129	1.67E+01	1.20E+01	1.67E+01	0.06%	1.67E+01	1.20E+01	1.67E+01	0.06%	9.63E+02	1.04E+01	9.63E+02	5.55%
Sr-90	1.53E+03	1.48E+01	1.53E+03	5.54%	1.48E+03	1.39E+01	1.48E+03	5.37%	4.81E+02	1.23E+01	4.81E+02	2.77%
U-233/234	9.15E+01	3.97E+00	9.15E+01	0.33%	8.52E+01	1.81E+00	8.52E+01	0.31%	1.18E+04	4.93E+00	1.18E+04	67.81%
U-235/236	5.82E+00	2.84E+00	5.82E+00	0.02%	4.42E+00	2.24E+00	4.42E+00	0.02%	3.94E+02	3.35E+00	3.94E+02	2.27%
			2.76E+04	100.00%			2.76E+04	100.00%			1.73E+04	100%

	ROLB Smear 2 Duplicate (pCi/filter)					MEAN (pCi/filter)	MEAN (%)	STD DEV
	Results	MDA	Used	Distribution				
Co-60	9.58E+01	7.77E+00	9.58E+01	0.58%	Co-60	2.51E+02	1.01%	0.54%
Cs-137	2.90E+03	1.17E+01	2.90E+03	17.44%	Cs-137	3.85E+03	17.29%	0.13%
H-3	-4.15E+02	6.85E+02	6.85E+02	4.12%	H-3	1.07E+04	39.71%	41.19%
I-129	9.32E+02	1.05E+01	9.32E+02	5.60%	I-129	4.82E+02	2.82%	3.19%
Sr-90	4.97E+02	1.26E+01	4.97E+02	2.99%	Sr-90	9.97E+02	4.17%	1.49%
U-233/234	1.11E+04	5.04E+00	1.11E+04	66.82%	U-233/234	5.76E+03	33.82%	38.68%
U-235/236	4.08E+02	3.28E+00	4.08E+02	2.45%	U-235/236	2.03E+02	1.19%	1.35%
			1.66E+04	100%			100.00%	

Units for sample concentrations are presented in pCi/filter. Filter in this context is defined as a standard smear sample take over a 100cm2 area.

HOT LABORATORY

Hot Cell Equipment #1 Smear

Surrogate	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	4.05E+04	8.07E+05	2.06E+02	8.07E+05	31.82%	1.00	2.47E-05
H-3	9.10E+06	6.26E+05	3.49E+02	6.26E+05	24.69%	0.76	8.52E-08
Co-60	1.10E+04	2.74E+05	1.24E+02	2.74E+05	10.81%	N/A	N/A
Sr-90	3.31E+04	8.27E+05	3.49E+02	8.27E+05	32.61%	N/A	N/A
Eu-154	4.50E+03	1.79E+03	3.69E+02	1.79E+03	0.07%	N/A	N/A
				2.54E+06	100.00%		

Adjusted Gross DCGL	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	4.04E+04	0.32	0.42	7.89E-06	11,481.58	2.84E-01
Co-60	1.10E+04	0.11	0.14	9.82E-06	3,898.33	3.54E-01
Sr-90	3.31E+04	0.33	0.43	9.85E-06	11,766.13	3.55E-01
Eu-154	4.50E+03	0.00	0.00	1.57E-07	25.47	5.66E-03
		0.75	1.00	2.77E-05		1
		Adjusted Gross DCGL		27172	dpm/100cm²	

Hot Cell Equipment #2 Smear

Surrogate	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	4.05E+04	2.71E+05	6.98E+01	2.71E+05	67.85%	1.00	2.47E-05
H-3	9.10E+06	4.69E+03	2.53E+02	4.69E+03	1.17%	0.02	1.90E-09
Co-60	1.10E+04	8.64E+03	2.25E+01	8.64E+03	2.16%	N/A	N/A
Sr-90	3.31E+04	1.15E+05	3.50E+02	1.15E+05	28.79%	N/A	N/A
Eu-154	4.50E+03	0.00E+00	8.27E+01	8.27E+01	0.02%	N/A	N/A
				3.99E+05	100.00%		

Adjusted Gross DCGL	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	4.05E+04	0.68	0.69	1.68E-05	24,703.68	6.10E-01
Co-60	1.10E+04	0.02	0.02	1.97E-06	787.60	7.16E-02
Sr-90	3.31E+04	0.29	0.29	8.70E-06	10,483.11	3.17E-01
Eu-154	4.50E+03	0.00	0.00	4.60E-08	7.54	1.68E-03
		0.99	1.00	2.75E-05		1
		Adjusted Gross DCGL		35982	dpm/100cm²	

Hot Cell Equipment #3 Smear

Surrogate	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	4.05E+04	4.51E+04	3.22E+01	4.51E+04	46.96%	1.00	2.47E-05
H-3	9.10E+06	1.73E+03	4.51E+02	1.73E+03	1.80%	0.04	4.22E-09
Co-60	1.10E+04	2.67E+03	1.27E+01	2.67E+03	2.78%	N/A	N/A
Sr-90	3.31E+04	4.63E+04	3.65E+02	4.63E+04	48.23%	N/A	N/A
Eu-154	4.50E+03	1.94E+02	7.49E+01	1.94E+02	0.20%	N/A	N/A
				9.60E+04	100.00%		

Adjusted Gross DCGL	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	4.05E+04	0.47	0.48	1.16E-05	16,116.35	3.98E-01
Co-60	1.10E+04	0.03	0.03	2.53E-06	954.12	8.67E-02
Sr-90	3.31E+04	0.48	0.49	1.46E-05	15,545.17	5.00E-01
Eu-154	4.50E+03	0.00	0.00	4.49E-07	69.33	1.54E-02
		0.98	1.00	2.92E-05		1
		Adjusted Gross DCGL		33685	dpm/100cm²	

Hot Cell Equipment #4 Smear

Surrogate	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	4.05E+04	3.99E+03	1.61E+01	3.99E+03	16.70%	1.00	2.47E-05
H-3	9.10E+06	1.51E+04	3.94E+02	1.51E+04	63.21%	3.78	4.16E-07
Co-60	1.10E+04	1.58E+03	1.23E+01	1.58E+03	6.61%	N/A	N/A
Sr-90	3.31E+04	3.18E+03	3.94E+02	3.18E+03	13.31%	N/A	N/A
Eu-154	4.50E+03	2.64E+01	3.99E+01	3.99E+01	0.17%	N/A	N/A
				2.39E+04	100.00%		

Adjusted Gross DCGL	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	3.98E+04	0.17	0.45	4.19E-06	11,440.75	2.87E-01
Co-60	1.10E+04	0.07	0.18	6.01E-06	4,530.42	4.12E-01
Sr-90	3.31E+04	0.13	0.36	4.02E-06	9,118.19	2.75E-01
Eu-154	4.50E+03	0.00	0.00	3.71E-07	114.41	2.54E-02
		0.37	1.00	1.46E-05		1
		Adjusted Gross DCGL		25204	dpm/100cm²	

Hot Cell Equipment #5 Smear

Surrogate	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	4.05E+04	2.85E+05	3.22E+01	2.85E+05	87.96%	1.00	2.47E-05
H-3	9.10E+06	7.61E+01	2.70E+02	2.70E+02	0.08%	0.00	1.04E-10
Co-60	1.10E+04	3.23E+02	7.08E+00	3.23E+02	0.10%	N/A	N/A
Sr-90	3.31E+04	3.84E+04	2.87E+02	3.84E+04	11.85%	N/A	N/A
Eu-154	4.50E+03	0.00E+00	3.04E+01	3.04E+01	0.01%	N/A	N/A
				3.24E+05	100.00%		

Adjusted Gross DCGL	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	4.05E+04	0.88	0.88	2.17E-05	34,615.50	8.55E-01
Co-60	1.10E+04	0.00	0.00	9.06E-08	39.23	3.57E-03
Sr-90	3.31E+04	0.12	0.12	3.58E-06	4,663.98	1.41E-01
Eu-154	4.50E+03	0.00	0.00	2.08E-08	3.69	8.21E-04
		1.00	1.00	2.54E-05		1
		Adjusted Gross DCGL		39322	dpm/100cm²	

Hot Cell Equipment #6 Smear

Surrogate	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	4.05E+04	1.16E+04	1.47E+01	1.16E+04	52.52%	1.00	2.47E-05
H-3	9.10E+06	1.95E+02	2.63E+02	2.63E+02	1.19%	0.02	2.49E-09
Co-60	1.10E+04	4.91E+02	7.50E+00	4.91E+02	2.22%	N/A	N/A
Sr-90	3.31E+04	9.70E+03	3.54E+02	9.70E+03	43.92%	N/A	N/A
Eu-154	4.50E+03	0.00E+00	3.11E+01	3.11E+01	0.14%	N/A	N/A
				2.21E+04	100.00%		

Adjusted Gross DCGL	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	4.05E+04	0.53	0.53	1.30E-05	18,382.13	4.54E-01
Co-60	1.10E+04	0.02	0.02	2.02E-06	778.07	7.07E-02
Sr-90	3.31E+04	0.44	0.44	1.33E-05	15,371.27	4.64E-01
Eu-154	4.50E+03	0.00	0.00	3.13E-07	49.28	1.10E-02
		0.99	1.00	2.86E-05		1
		Adjusted Gross DCGL		34581	dpm/100cm²	

Hot Cell Equipment #7 Smear

Surrogate	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	4.05E+04	1.09E+05	5.49E+01	1.09E+05	27.24%	1.00	2.47E-05
H-3	9.10E+06	1.63E+05	6.91E+02	1.63E+05	40.73%	1.50	1.64E-07
Co-60	1.10E+04	6.08E+03	2.03E+01	6.08E+03	1.52%	N/A	N/A
Sr-90	3.31E+04	1.22E+05	3.47E+02	1.22E+05	30.49%	N/A	N/A
Eu-154	4.50E+03	0.00E+00	7.95E+01	7.95E+01	0.02%	N/A	N/A
				4.00E+05	100.00%		

Adjusted Gross DCGL	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	4.02E+04	0.27	0.46	6.77E-06	15,646.63	3.89E-01
Co-60	1.10E+04	0.02	0.03	1.38E-06	872.86	7.94E-02
Sr-90	3.31E+04	0.30	0.51	9.21E-06	17,514.98	5.29E-01
Eu-154	4.50E+03	0.00	0.00	4.41E-08	11.41	2.54E-03
		0.59	1.00	1.74E-05		1
		Adjusted Gross DCGL		34048	dpm/100cm²	

Hot Cell #1 Surface Smear

Surrogate	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	4.05E+04	8.03E+05	1.25E+02	8.03E+05	37.17%	1.00	2.47E-05
H-3	9.10E+06	5.43E+04	4.01E+02	5.43E+04	2.51%	0.07	7.43E-09
Co-60	1.10E+04	5.16E+04	5.16E+01	5.16E+04	2.39%	N/A	N/A
Sr-90	3.31E+04	1.25E+06	2.72E+02	1.25E+06	57.87%	N/A	N/A
Eu-154	4.50E+03	1.18E+03	1.44E+02	1.18E+03	0.05%	N/A	N/A
				2.16E+06	100.00%		

Adjusted Gross DCGL	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	4.05E+04	0.37	0.38	9.18E-06	12,837.60	3.17E-01
Co-60	1.10E+04	0.02	0.02	2.17E-06	824.93	7.50E-02
Sr-90	3.31E+04	0.56	0.56	1.75E-05	19,983.82	6.04E-01
Eu-154	4.50E+03	0.00	0.00	1.21E-07	18.86	4.19E-03
		0.97	1.00	2.90E-05		1
		Adjusted Gross DCGL		33665	dpm/100cm²	

Hot Cell #2 Surface Smear

Surrogate	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	4.05E+04	1.09E+05	6.47E+01	1.09E+05	42.68%	1.00	2.47E-05
H-3	9.10E+06	1.09E+04	5.33E+02	1.09E+04	4.27%	0.10	1.10E-08
Co-60	1.10E+04	2.01E+04	3.13E+01	2.01E+04	7.87%	N/A	N/A
Sr-90	3.31E+04	1.15E+05	3.29E+02	1.15E+05	45.03%	N/A	N/A
Eu-154	4.50E+03	4.07E+02	7.91E+01	4.07E+02	0.16%	N/A	N/A
				2.55E+05	100.00%		

Adjusted Gross DCGL	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	4.05E+04	0.43	0.45	1.05E-05	13,482.43	3.33E-01
Co-60	1.10E+04	0.06	0.06	7.15E-06	2,486.21	2.26E-01
Sr-90	3.31E+04	0.45	0.47	1.36E-05	14,224.56	4.30E-01
Eu-154	4.50E+03	0.00	0.00	3.54E-07	50.34	1.12E-02
		0.96	1.00	3.17E-05		1
		Adjusted Gross DCGL		30244	dpm/100cm²	

Hot Cell #3 Surface Smear

Surrogate	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	4.05E+04	3.57E+03	9.55E+00	3.57E+03	55.36%	1.00	2.47E-05
H-3	9.10E+06	1.71E+01	2.26E+02	2.26E+02	3.50%	0.06	6.96E-09
Co-60	1.10E+04	3.87E+02	8.70E+00	3.87E+02	6.00%	N/A	N/A
Sr-90	3.31E+04	2.24E+03	3.67E+02	2.24E+03	34.73%	N/A	N/A
Eu-154	4.50E+03	5.35E+00	2.59E+01	2.59E+01	0.40%	N/A	N/A
				6.45E+03	100.00%		

Adjusted Gross DCGL	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	4.05E+04	0.55	0.57	1.37E-05	18,141.71	4.48E-01
Co-60	1.10E+04	0.06	0.06	5.46E-06	1,966.62	1.79E-01
Sr-90	3.31E+04	0.35	0.36	1.05E-05	11,383.04	3.44E-01
Eu-154	4.50E+03	0.00	0.00	8.92E-07	131.62	2.92E-02
		0.96	1.00	3.05E-05		1
		Adjusted Gross DCGL		31623	dpm/100cm²	

Hot Cell #4 Surface Smear

Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	4.05E+04	5.87E+03	1.17E+01	5.87E+03	51.16%	1.00	2.47E-05
H-3	9.10E+06	6.17E+02	4.37E+02	6.17E+02	5.38%	0.11	1.16E-08
-60	1.10E+04	2.70E+02	5.70E+00	2.70E+02	2.35%	N/A	N/A
90	3.31E+04	4.70E+03	3.00E+02	4.70E+03	40.96%	N/A	N/A
-154	4.50E+03	1.76E+00	1.69E+01	1.69E+01	0.15%	N/A	N/A
				1.15E+04	100.00%		

Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	4.05E+04	0.51	0.54	1.26E-05	18,617.13	4.60E-01
Co-60	1.10E+04	0.02	0.02	2.14E-06	856.32	7.78E-02
Sr-90	3.31E+04	0.41	0.43	1.24E-05	14,906.39	4.50E-01
Eu-154	4.50E+03	0.00	0.00	3.27E-07	53.60	1.19E-02
		0.95	1.00	2.75E-05		1
			Adjusted Gross DCGL	34433	dpm/100cm²	

Hot Cell #5 Surface Smear

Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	4.05E+04	1.75E+04	1.70E+01	1.75E+04	73.97%	1.00	2.47E-05
H-3	9.10E+06	3.32E+01	3.17E+02	3.17E+02	1.34%	0.02	1.99E-09
Co-60	1.10E+04	1.53E+02	9.69E+00	1.53E+02	0.65%	N/A	N/A
Sr-90	3.31E+04	5.66E+03	3.56E+02	5.66E+03	23.92%	N/A	N/A
Eu-154	4.50E+03	2.62E+00	2.75E+01	2.75E+01	0.12%	N/A	N/A
				2.37E+04	100.00%		

Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	4.05E+04	0.74	0.75	1.83E-05	26,063.09	6.93E-01
Co-60	1.10E+04	0.01	0.01	5.88E-07	245.53	2.23E-02
Sr-90	3.31E+04	0.24	0.24	7.23E-06	9,082.87	2.74E-01
Eu-154	4.50E+03	0.00	0.00	2.58E-07	44.13	9.81E-03
		0.99	1.00	2.63E-05		1
			Adjusted Gross DCGL	37456	dpm/100cm²	

Hot Cell #6 Surface Smear

Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	4.05E+04	8.19E+04	2.75E+01	8.19E+04	67.50%	1.00	2.47E-05
H-3	9.10E+06	4.47E+02	2.44E+02	4.47E+02	0.37%	0.01	6.00E-10
Co-60	1.10E+04	1.44E+03	9.69E+00	1.44E+03	1.19%	N/A	N/A
Sr-90	3.31E+04	3.75E+04	2.89E+02	3.75E+04	30.91%	N/A	N/A
Eu-154	4.50E+03	0.00E+00	4.01E+01	4.01E+01	0.03%	N/A	N/A
				1.21E+05	100.00%		

Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	4.05E+04	0.68	0.68	1.67E-05	24,855.68	6.14E-01
Co-60	1.10E+04	0.01	0.01	1.08E-06	437.02	3.97E-02
Sr-90	3.31E+04	0.31	0.31	9.34E-06	11,380.80	3.44E-01
Eu-154	4.50E+03	0.00	0.00	7.34E-08	12.17	2.70E-03
		1.00	1.00	2.72E-05		1
			Adjusted Gross DCGL	36685	dpm/100cm²	

Hot Cell #7 Surface Smear

Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	4.05E+04	3.95E+04	2.40E+01	3.95E+04	84.66%	1.00	2.47E-05
H-3	9.10E+06	6.81E+02	2.44E+02	6.81E+02	1.46%	0.02	1.89E-09
Co-60	1.10E+04	5.30E+02	9.30E+00	5.30E+02	1.14%	N/A	N/A
Sr-90	3.31E+04	5.91E+03	2.95E+02	5.91E+03	12.67%	N/A	N/A
Eu-154	4.50E+03	1.31E+01	3.46E+01	3.46E+01	0.07%	N/A	N/A
				4.67E+04	100.00%		

Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	4.05E+04	0.85	0.86	2.09E-05	32,549.92	8.06E-01
Co-60	1.10E+04	0.01	0.01	1.03E-06	438.09	3.98E-02
Sr-90	3.31E+04	0.13	0.13	3.83E-06	4,885.09	1.48E-01
Eu-154	4.50E+03	0.00	0.00	1.65E-07	28.60	6.36E-03
		0.99	1.00	2.59E-05		1
			Adjusted Gross DCGL	38002	dpm/100cm²	

Hot Cell Mean Distribution

Surrogate

	DCGL (dpm/100cm²)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	4.05E+04	53.11%	1.00	2.47E-05
H-3	9.10E+06	10.84%	0.20	2.24E-06
Co-60	1.10E+04	3.41%	N/A	N/A
Sr-90	3.31E+04	32.52%	N/A	N/A
Eu-154	4.50E+03	0.12%	N/A	N/A
		100.00%		

Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	4.05E+04	0.53	0.60	1.31E-05	20,186.50	4.99E-01
Co-60	1.10E+04	0.03	0.04	3.10E-06	1,297.33	1.18E-01
Sr-90	3.31E+04	0.33	0.36	9.83E-06	12,360.27	3.73E-01
Eu-154	4.50E+03	0.00	0.00	2.57E-07	43.89	9.75E-03
		0.89	1.00	2.63E-05		1
			Adjusted Gross DCGL	33888	dpm/100cm²	

	Mean Conc (pCi/filter)	Mean Distribution	Std Deviation
Cs-137	1.85E+05	53.11%	21.35%
H-3	6.28E+04	10.84%	19.01%
Co-60	2.63E+04	3.41%	3.15%
Sr-90	1.84E+05	32.52%	13.97%
Eu-154	2.84E+02	0.12%	0.10%
		100.00%	

Area	
Hot Cell Equipment #1 Smear	27172
Hot Cell Equipment #2 Smear	35982
Hot Cell Equipment #3 Smear	33685
Hot Cell Equipment #4 Smear	25204
Hot Cell Equipment #5 Smear	39322
Hot Cell Equipment #6 Smear	34581
Hot Cell Equipment #7 Smear	34048
Hot Cell #1 Surface Smear	33665
Hot Cell #2 Surface Smear	30244
Hot Cell #3 Surface Smear	31623
Hot Cell #4 Surface Smear	34433
Hot Cell #5 Surface Smear	37456
Hot Cell #6 Surface Smear	36686
Hot Cell #7 Surface Smear	38002
Hot Cell Mean Distribution	33888
Mean	33722
Median	34241
Minimum	25204
Maximum	39322
Standard Deviation	4027

BALANCE OF PLANT

Quad A Smear
Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	4.05E+04	1.22E+02	9.49E+00	1.22E+02	0.14%	1.00	2.47E-05
H-3	9.10E+06	8.07E+04	5.22E+02	8.07E+04	95.25%	661.48	7.27E-05
I-129	1.49E+04	5.06E+00	1.57E+01	1.57E+01	0.02%	0.13	8.64E-06
Co-60	1.10E+04	3.78E+03	7.07E+00	3.78E+03	4.46%	N/A	N/A
Sr-90	3.31E+04	7.93E+01	8.56E+00	7.93E+01	0.09%	N/A	N/A
Eu-154	4.50E+03	0.00E+00	2.31E+01	2.31E+01	0.03%	N/A	N/A
				8.47E+04	100.00%		

Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	9.43E+03	0.00	0.03	1.53E-07	335.07	3.55E-02
Co-60	1.10E+04	0.04	0.94	4.06E-06	10,381.77	9.44E-01
Sr-90	3.31E+04	0.00	0.02	2.83E-08	217.80	6.58E-03
Eu-154	4.50E+03	0.00	0.01	6.06E-06	63.44	1.41E-02
		0.05	1.00	4.30E-06		1
		Adjusted Gross DCGL		10998	dpm/100cm²	

Quad C Smear
Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	4.05E+04	7.44E+01	1.02E+01	7.44E+01	0.17%	1.00	2.47E-05
H-3	9.10E+06	3.90E+04	3.57E+02	3.90E+04	89.33%	524.19	5.76E-05
I-129	1.49E+04	3.62E+00	1.35E+01	1.35E+01	0.03%	0.18	1.22E-05
Co-60	1.10E+04	4.50E+03	7.40E+00	4.50E+03	10.31%	N/A	N/A
Sr-90	3.31E+04	4.27E+01	9.20E+00	4.27E+01	0.10%	N/A	N/A
Eu-154	4.50E+03	0.00E+00	2.63E+01	2.63E+01	0.06%	N/A	N/A
				4.37E+04	100.00%		

Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	1.06E+04	0.00	0.02	1.61E-07	175.78	1.66E-02
Co-60	1.10E+04	0.10	0.97	9.37E-06	10,631.91	9.67E-01
Sr-90	3.31E+04	0.00	0.01	2.95E-06	100.89	3.05E-03
Eu-154	4.50E+03	0.00	0.01	1.34E-07	62.14	1.38E-02
		0.11	1.00	9.70E-06		1
		Adjusted Gross DCGL		10971	dpm/100cm²	

Canal E Smear
Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	4.05E+04	1.44E+02	1.23E+01	1.44E+02	0.26%	1.00	2.47E-05
H-3	9.10E+06	4.81E+04	4.14E+02	4.81E+04	85.89%	334.03	3.67E-05
I-129	1.49E+04	3.74E+00	1.88E+01	1.88E+01	0.03%	0.13	8.76E-06
Co-60	1.10E+04	7.61E+03	9.32E+00	7.61E+03	13.59%	N/A	N/A
Sr-90	3.31E+04	1.02E+02	8.25E+00	1.02E+02	0.18%	N/A	N/A
Eu-154	4.50E+03	0.00E+00	2.77E+01	2.77E+01	0.05%	N/A	N/A
				5.60E+04	100.00%		

Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	1.43E+04	0.00	0.02	1.80E-07	202.49	1.42E-02
Co-60	1.10E+04	0.14	0.97	1.24E-05	10,700.85	9.73E-01
Sr-90	3.31E+04	0.00	0.01	5.50E-08	143.43	4.33E-03
Eu-154	4.50E+03	0.00	0.00	1.10E-07	38.95	8.66E-03
		0.14	1.00	1.27E-05		1
		Adjusted Gross DCGL		11086	dpm/100cm²	

Lilly Pad Smear
Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	4.05E+04	1.39E+01	4.05E+00	1.39E+01	0.21%	1.00	2.47E-05
H-3	9.10E+06	6.42E+03	3.06E+02	6.42E+03	95.41%	461.87	5.08E-05
I-129	1.49E+04	1.54E+01	2.21E+01	2.21E+01	0.33%	1.59	1.07E-04
Co-60	1.10E+04	2.53E+02	4.03E+00	2.53E+02	3.76%	N/A	N/A
Sr-90	3.31E+04	9.77E+00	8.11E+00	9.77E+00	0.15%	N/A	N/A
Eu-154	4.50E+03	1.43E+00	1.04E+01	1.04E+01	0.15%	N/A	N/A
				6.73E+03	100.00%		

Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	5.49E+03	0.00	0.05	3.76E-07	493.99	9.00E-02
Co-60	1.10E+04	0.04	0.88	3.42E-06	8,991.33	8.17E-01
Sr-90	3.31E+04	0.00	0.03	4.39E-08	347.21	1.05E-02
Eu-154	4.50E+03	0.00	0.04	3.43E-07	369.60	8.21E-02
		0.04	1.00	4.18E-06		1
		Adjusted Gross DCGL		10202	dpm/100cm²	

CTMT General Area Smear
Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	4.05E+04	3.64E+02	9.38E+00	3.64E+02	0.15%	1.00	2.47E-05
H-3	9.10E+06	2.42E+05	9.07E+02	2.42E+05	98.29%	664.84	7.31E-05
I-129	1.49E+04	-5.02E+00	1.00E+01	1.00E+01	0.00%	0.03	1.84E-06
Co-60	1.10E+04	3.57E+03	6.77E+00	3.57E+03	1.45%	N/A	N/A
Sr-90	3.31E+04	2.42E+02	8.64E+00	2.42E+02	0.10%	N/A	N/A
Eu-154	4.50E+03	0.00E+00	2.08E+01	2.08E+01	0.01%	N/A	N/A
				2.46E+05	100.00%		

Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	1.00E+04	0.00	0.09	1.47E-07	976.58	9.73E-02
Co-60	1.10E+04	0.01	0.85	1.32E-06	9,577.95	8.71E-01
Sr-90	3.31E+04	0.00	0.06	2.97E-08	649.26	1.96E-02
Eu-154	4.50E+03	0.00	0.00	1.88E-08	55.80	1.24E-02
		0.02	1.00	1.51E-06		1
		Adjusted Gross DCGL		11260	dpm/100cm²	

Rx Building Smear
Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	4.05E+04	4.64E+03	1.02E+01	4.64E+03	26.21%	1.00	2.47E-05
H-3	9.10E+06	1.07E+04	2.89E+01	1.07E+04	60.45%	2.31	2.53E-07
I-129	1.49E+04	1.02E+01	8.17E+00	1.02E+01	0.06%	0.00	1.48E-07
Co-60	1.10E+04	2.38E+02	8.51E+00	2.38E+02	1.34%	N/A	N/A
Sr-90	3.31E+04	2.04E+03	1.44E+01	2.04E+03	11.53%	N/A	N/A
Eu-154	4.50E+03	7.18E+01	1.75E+01	7.18E+01	0.41%	N/A	N/A
				1.77E+04	100.00%		

Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	3.99E+04	0.26	0.66	6.58E-06	21,516.18	5.40E-01
Co-60	1.10E+04	0.01	0.03	1.22E-06	1,103.63	1.00E-01
Sr-90	3.31E+04	0.12	0.29	3.48E-06	9,459.70	2.86E-01
Eu-154	4.50E+03	0.00	0.01	9.01E-07	332.94	7.40E-02
		0.39	1.00	1.22E-05		1
		Adjusted Gross DCGL		32412	dpm/100cm²	

Rx Building Smear Duplicate
Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	4.05E+04	5.63E+03	1.01E+01	5.63E+03	27.05%	1.00	2.47E-05
H-3	9.10E+06	1.05E+04	2.84E+01	1.05E+04	50.44%	1.87	2.05E-07
I-129	1.49E+04	1.94E+01	1.00E+01	1.94E+01	0.09%	0.00	2.31E-07
Co-60	1.10E+04	2.53E+03	7.07E+00	2.53E+03	12.15%	N/A	N/A
Sr-90	3.31E+04	2.04E+03	1.44E+01	2.04E+03	9.80%	N/A	N/A
Eu-154	4.50E+03	9.62E+01	1.59E+01	9.62E+01	0.46%	N/A	N/A
				2.08E+04	100.00%		

Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	3.98E+04	0.27	0.55	6.80E-06	12,387.85	3.11E-01
Co-60	1.10E+04	0.12	0.25	1.10E-05	5,556.83	5.06E-01
Sr-90	3.31E+04	0.10	0.20	2.96E-06	4,488.67	1.36E-01
Eu-154	4.50E+03	0.00	0.01	1.03E-06	211.67	4.70E-02
		0.49	1.00	2.18E-05		1
		Adjusted Gross DCGL		22655	dpm/100cm²	

Rx Building Mean Distribution
Surrogate

	DCGL (dpm/100cm²)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	4.05E+04	7.74%	1.00	2.47E-05
H-3	9.10E+06	82.15%	10.61	1.17E-06
I-129	1.49E+04	0.06%	0.01	7.01E-07
Co-60	1.10E+04	6.72%	N/A	N/A
Sr-90	3.31E+04	3.13%	N/A	N/A
Eu-154	4.50E+03	0.17%	N/A	N/A
		100.00%		

Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	3.77E+04	0.06	0.44	2.06E-06	8,160.30	2.17E-01
Co-60	1.10E+04	0.07	0.38	6.11E-06	7,067.95	6.44E-01
Sr-90	3.31E+04	0.03	0.16	9.47E-07	3,304.44	9.96E-02
Eu-154	4.50E+03	0.00	0.01	3.71E-07	175.86	3.91E-02
		0.18	1.00	9.49E-06		1
		Adjusted Gross DCGL		18729	dpm/100cm²	

	Mean Conc (pCi/filter)	Mean Distribution	Std Deviation
Cs-137	1.57E+03	7.74%	12.91%
H-3	6.25E+04	82.15%	18.93%
I-129	1.57E+01	0.06%	0.11%
Co-60	3.21E+03	6.72%	5.17%
Sr-90	6.51E+02	3.13%	5.17%
Eu-154	3.95E+01	0.17%	0.19%

Area	
Quad A Smear	10998
Quad C Smear	10971
Canal E Smear	11086
Lilly Pad Smear	10202
CTMT General Area Smear	11260
Rx Building Smear	32412
Rx Building Smear Duplicate	22655
Rx Building Mean Distribution	18729
Mean	15655
Median	11086
Minimum	10202
Maximum	32412
Standard Deviation	8596

Reactor Operations & Laboratory Building

ROLB Smear
Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Alpha							
U-233/234	3.15E+04	9.15E+01	3.97E+00	9.15E+01	0.33%	N/A	N/A
U-235/236	2.71E+04	5.82E+00	2.84E+00	5.82E+00	0.02%	N/A	N/A
Beta							
Cs-137	4.05E+04	4.77E+03	1.37E+01	4.77E+03	17.27%	1.00	2.47E-05
H-3	9.10E+06	2.08E+04	5.30E+01	2.08E+04	75.30%	4.36	4.79E-07
I-129	1.49E+04	1.67E+01	1.20E+01	1.67E+01	0.06%	0.00	2.35E-07
Co-60	1.10E+04	4.09E+02	1.16E+01	4.09E+02	1.48%	N/A	N/A
Sr-90	3.31E+04	1.53E+03	1.48E+01	1.53E+03	5.54%	N/A	N/A
				2.76E+04	100.00%		

Adjusted Gross DCGL
Alpha

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
U-233/234	3.15E+04	0.0033	0.94	1.05E-07	29,331.42	9.31E-01
U-235/236	2.71E+04	0.0002	0.06	7.77E-09	1,865.67	6.88E-02
		0.00	1.00	1.13E-07		1
			Adjusted Gross DCGL	31197	dpm/100cm²	

Beta

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	3.94E+04	0.17	0.71	4.39E-06	23,314.96	5.92E-01
Co-60	1.10E+04	0.01	0.06	1.35E-06	1,999.12	1.82E-01
Sr-90	3.31E+04	0.06	0.23	1.67E-06	7,478.38	2.26E-01
		0.24	1.00	7.41E-06		1
			Adjusted Gross DCGL	32792	dpm/100cm²	

ROLB Smear Duplicate
Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Alpha							
U-233/234	3.15E+04	8.52E+01	1.81E+00	8.52E+01	0.31%	N/A	N/A
U-235/236	2.71E+04	4.42E+00	2.24E+00	4.42E+00	0.02%	N/A	N/A
Beta							
Cs-137	4.05E+04	4.77E+03	1.37E+01	4.77E+03	17.30%	1.00	2.47E-05
H-3	9.10E+06	2.08E+04	5.30E+01	2.08E+04	75.46%	4.36	4.79E-07
I-129	1.49E+04	1.67E+01	1.20E+01	1.67E+01	0.06%	0.00	2.35E-07
Co-60	1.10E+04	4.09E+02	1.16E+01	4.09E+02	1.48%	N/A	N/A
Sr-90	3.31E+04	1.48E+03	1.39E+01	1.48E+03	5.37%	N/A	N/A
				2.76E+04	100.00%		

Adjusted Gross DCGL
Alpha

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
U-233/234	3.15E+04	0.0031	0.95	9.81E-08	29,708.55	9.43E-01
U-235/236	2.71E+04	0.0002	0.05	5.92E-09	1,541.22	5.69E-02
		0.00	1.00	1.04E-07		1
			Adjusted Gross DCGL	31250	dpm/100cm²	

Beta

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	3.94E+04	0.17	0.72	4.40E-06	23,488.38	5.97E-01
Co-60	1.10E+04	0.01	0.05	1.35E-06	2,013.99	1.83E-01
Sr-90	3.31E+04	0.05	0.22	1.62E-06	7,287.80	2.20E-01
		0.24	1.00	7.37E-06		1
			Adjusted Gross DCGL	32790	dpm/100cm²	

ROLB Smear 2
Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Alpha							
U-233/234	3.15E+04	1.18E+04	4.93E+00	1.18E+04	67.81%	N/A	N/A
U-235/236	2.71E+04	3.94E+02	3.35E+00	3.94E+02	2.27%	N/A	N/A
Beta							
Cs-137	4.05E+04	2.97E+03	1.14E+01	2.97E+03	17.14%	1.00	2.47E-05
H-3	9.10E+06	-4.98E+02	6.84E+02	6.84E+02	3.95%	0.23	2.53E-08
I-129	1.49E+04	9.63E+02	1.04E+01	9.63E+02	5.55%	0.32	2.18E-05
Co-60	1.10E+04	8.90E+01	8.81E+00	8.90E+01	0.51%	N/A	N/A
Sr-90	3.31E+04	4.81E+02	1.23E+01	4.81E+02	2.77%	N/A	N/A
				1.73E+04	100.00%		

Adjusted Gross DCGL
Alpha

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
U-233/234	3.15E+04	0.6781	0.97	2.15E-05	30,320.43	9.63E-01
U-235/236	2.71E+04	0.0227	0.03	8.37E-07	1,014.81	3.74E-02
		0.70	1.00	2.24E-05		1
			Adjusted Gross DCGL	31335	dpm/100cm²	

Beta

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
'37	2.15E+04	0.17	0.84	7.86E-06	18,488.97	8.59E-01
,0	1.10E+04	0.01	0.03	4.68E-07	553.61	5.03E-02
,0	3.31E+04	0.03	0.14	8.38E-07	2,993.79	9.04E-02
		0.20	1.00	9.27E-06		1
			Adjusted Gross DCGL	22036	dpm/100cm²	

ROLB Smear 2 Duplicate
Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Alpha							
U-233/234	3.15E+04	1.11E+04	5.04E+00	1.11E+04	66.82%	N/A	N/A
U-235/236	2.71E+04	4.08E+02	3.28E+00	4.08E+02	2.45%	N/A	N/A
Beta							
Cs-137	4.05E+04	2.90E+03	1.17E+01	2.90E+03	17.44%	1.00	2.47E-05
H-3	9.10E+06	-4.15E+02	6.85E+02	6.85E+02	4.12%	0.24	2.59E-08
I-129	1.49E+04	9.32E+02	1.05E+01	9.32E+02	5.60%	0.32	2.15E-05
Co-60	1.10E+04	9.58E+01	7.77E+00	9.58E+01	0.58%	N/A	N/A
Sr-90	3.31E+04	4.97E+02	1.26E+01	4.97E+02	2.99%	N/A	N/A
				1.66E+04	100.00%		

Adjusted Gross DCGL
Alpha

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
U-233/234	3.15E+04	0.6682	0.96	2.12E-05	30,211.85	9.59E-01
U-235/236	2.71E+04	0.0245	0.04	9.04E-07	1,106.22	4.09E-02
		0.69	1.00	2.21E-05		1
			Adjusted Gross DCGL	31320	dpm/100cm²	

Beta

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	2.15E+04	0.17	0.83	8.07E-06	18,369.36	8.50E-01
Co-60	1.10E+04	0.01	0.03	5.23E-07	605.88	5.51E-02
Sr-90	3.31E+04	0.03	0.14	9.03E-07	3,147.10	9.51E-02
		0.21	1.00	9.50E-06		1
			Adjusted Gross DCGL	22122	dpm/100cm²	

ROLB Mean Distribution
Surrogate

	DCGL (dpm/100cm²)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Alpha				
U-233/234	3.15E+04	33.82%	N/A	N/A
U-235/236	2.71E+04	1.19%	N/A	N/A
Beta				
Cs-137	4.05E+04	17.29%	1.00	2.47E-05
H-3	9.10E+06	39.71%	2.30	2.52E-07
I-129	1.49E+04	2.82%	0.16	1.09E-05
Co-60	1.10E+04	1.01%	N/A	N/A
Sr-90	3.31E+04	4.17%	N/A	N/A
		100.00%		

Adjusted Gross DCGL
Alpha

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
U-233/234	3.15E+04	0.3382	0.97	1.07E-05	30,262.78	9.61E-01
U-235/236	2.71E+04	0.0119	0.03	4.39E-07	1,064.41	3.93E-02
		0.35	1.00	1.12E-05		1
			Adjusted Gross DCGL	31327	dpm/100cm²	

Beta

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	2.79E+04	0.17	0.77	6.20E-06	20,619.05	7.40E-01
Co-60	1.10E+04	0.01	0.05	9.21E-07	1,206.43	1.10E-01
Sr-90	3.31E+04	0.04	0.18	1.26E-06	4,970.80	1.50E-01
		0.22	1.00	8.38E-06		1
			Adjusted Gross DCGL	26796	dpm/100cm²	

	Mean Conc (pCi/filter)	Mean Distribution	Std Deviation
U-233/234	5.76E+03	33.82%	38.68%
U-235/236	2.03E+02	1.19%	1.35%
Cs-137	3.85E+03	17.29%	0.13%
H-3	1.07E+04	39.71%	41.19%
I-129	4.82E+02	2.82%	3.19%
Co-60	2.51E+02	1.01%	0.54%
Sr-90	9.97E+02	4.17%	1.49%
		100.00%	

Area		
ROLB Smear	Alpha	31197
	Beta	32792
ROLB Smear Duplicate	Alpha	31250
	Beta	32790
ROLB Smear 2	Alpha	31335
	Beta	22036
ROLB Smear 2 Duplicate	Alpha	31320
	Beta	22122
ROLB Mean Distribution	Alpha	31327
	Beta	26796
Mean	Alpha	31276
	Beta	27435
Median	Alpha	31285
	Beta	27456
Minimum	Alpha	31197
	Beta	22036
Maximum	Alpha	31335
	Beta	32792
Standard Deviation	Alpha	64
	Beta	6185

HOT LABORATORY

Hot Cell Equipment #1 Smear

Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	1.22E+05	8.07E+05	2.06E+02	8.07E+05	31.82%	1.00	8.20E-06
H-3	9.10E+06	6.26E+05	3.49E+02	6.26E+05	24.69%	0.78	8.52E-06
Co-60	1.83E+05	2.74E+05	1.24E+02	2.74E+05	10.81%	N/A	N/A
Sr-90	3.31E+04	8.27E+05	3.49E+02	8.27E+05	32.61%	N/A	N/A
Eu-154	4.76E+05	1.79E+03	3.69E+02	1.79E+03	0.07%	N/A	N/A
				2.54E+06	100.00%		

Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	1.21E+05	0.32	0.42	2.64E-06	24,329.60	2.01E-01
Co-60	1.83E+05	0.11	0.14	5.90E-07	8,260.61	4.51E-02
Sr-90	3.31E+04	0.33	0.43	9.85E-06	24,932.57	7.53E-01
Eu-154	4.76E+05	0.00	0.00	1.48E-09	53.97	1.13E-04
		0.75	1.00	1.31E-05		1
			Adjusted Gross DCGL	57577	dpm/100cm²	

Hot Cell Equipment #2 Smear

Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	1.22E+05	2.71E+05	6.98E+01	2.71E+05	67.85%	1.00	8.20E-06
H-3	9.10E+06	4.69E+03	2.53E+02	4.69E+03	1.17%	0.02	1.90E-09
Co-60	1.83E+05	8.64E+03	2.25E+01	8.64E+03	2.16%	N/A	N/A
Sr-90	3.31E+04	1.15E+05	3.50E+02	1.15E+05	28.79%	N/A	N/A
Eu-154	4.76E+05	0.00E+00	8.27E+01	8.27E+01	0.02%	N/A	N/A
				3.99E+05	100.00%		

Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	1.22E+05	0.68	0.65	5.56E-06	47,183.49	3.87E-01
Co-60	1.83E+05	0.02	0.02	1.18E-07	1,504.30	8.22E-03
Sr-90	3.31E+04	0.29	0.29	8.70E-06	20,022.52	6.05E-01
Eu-154	4.76E+05	0.00	0.00	4.35E-10	14.40	3.02E-05
		0.99	1.00	1.44E-05		1
			Adjusted Gross DCGL	68725	dpm/100cm²	

Hot Cell Equipment #3 Smear

Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	1.22E+05	4.51E+04	3.22E+01	4.51E+04	46.98%	1.00	8.20E-06
H-3	9.10E+06	1.73E+03	4.51E+02	1.73E+03	1.80%	0.04	4.22E-09
Co-60	1.83E+05	2.67E+03	1.27E+01	2.67E+03	2.78%	N/A	N/A
Sr-90	3.31E+04	4.63E+04	3.65E+02	4.63E+04	48.23%	N/A	N/A
Eu-154	4.76E+05	1.94E+02	7.49E+01	1.94E+02	0.20%	N/A	N/A
				9.60E+04	100.00%		

Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	1.22E+05	0.47	0.48	3.85E-06	25,285.21	2.07E-01
Co-60	1.83E+05	0.03	0.03	1.52E-07	1,496.93	8.18E-03
Sr-90	3.31E+04	0.48	0.49	1.46E-05	25,957.99	7.84E-01
Eu-154	4.76E+05	0.00	0.00	4.25E-09	108.77	2.28E-04
		0.96	1.00	1.86E-05		1
			Adjusted Gross DCGL	52849	dpm/100cm²	

Hot Cell Equipment #4 Smear

Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	1.22E+05	3.99E+03	1.61E+01	3.99E+03	16.70%	1.00	8.20E-06
H-3	9.10E+06	1.51E+04	3.94E+02	1.51E+04	63.21%	3.78	4.16E-07
Co-60	1.83E+05	1.58E+03	1.23E+01	1.58E+03	6.61%	N/A	N/A
Sr-90	3.31E+04	3.18E+03	3.94E+02	3.18E+03	13.31%	N/A	N/A
Eu-154	4.76E+05	2.64E+01	3.99E+01	3.99E+01	0.17%	N/A	N/A
				2.39E+04	100.00%		

Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	1.16E+05	0.17	0.45	1.44E-06	28,673.17	2.47E-01
Co-60	1.83E+05	0.07	0.18	3.61E-07	11,354.29	6.20E-02
Sr-90	3.31E+04	0.13	0.36	4.02E-06	22,852.30	6.90E-01
Eu-154	4.76E+05	0.00	0.00	3.51E-09	286.73	6.02E-04
		0.37	1.00	5.82E-06		1
			Adjusted Gross DCGL	63166	dpm/100cm²	

Hot Cell Equipment #5 Smear

Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	1.22E+05	2.85E+05	3.22E+01	2.85E+05	87.96%	1.00	8.20E-06
H-3	9.10E+06	7.61E+01	2.70E+02	2.70E+02	0.08%	0.00	1.04E-10
Co-60	1.83E+05	3.23E+02	7.06E+00	3.23E+02	0.10%	N/A	N/A
Sr-90	3.31E+04	3.84E+04	2.87E+02	3.84E+04	11.85%	N/A	N/A
Eu-154	4.76E+05	0.00E+00	3.04E+01	3.04E+01	0.01%	N/A	N/A
				3.24E+05	100.00%		

Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	1.22E+05	0.88	0.88	7.21E-06	81,474.06	6.66E-01
Co-60	1.83E+05	0.00	0.00	5.45E-09	92.34	5.05E-04
Sr-90	3.31E+04	0.12	0.12	3.58E-06	10,977.56	3.32E-01
Eu-154	4.76E+05	0.00	0.00	1.97E-10	8.69	1.83E-05
		1.00	1.00	1.08E-05		1
			Adjusted Gross DCGL	92553	dpm/100cm²	

Hot Cell Equipment #6 Smear

Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	1.22E+05	1.16E+04	1.47E+01	1.16E+04	52.52%	1.00	8.20E-06
H-3	9.10E+06	1.95E+02	2.63E+02	2.63E+02	1.19%	0.02	2.49E-09
Co-60	1.83E+05	4.91E+02	7.50E+00	4.91E+02	2.22%	N/A	N/A
Sr-90	3.31E+04	9.70E+03	3.54E+02	9.70E+03	43.92%	N/A	N/A
Eu-154	4.76E+05	0.00E+00	3.11E+01	3.11E+01	0.14%	N/A	N/A
				2.21E+04	100.00%		

Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	1.22E+05	0.53	0.53	4.31E-06	29,674.30	2.43E-01
Co-60	1.83E+05	0.02	0.02	1.21E-07	1,256.04	6.86E-03
Sr-90	3.31E+04	0.44	0.44	1.33E-05	24,813.86	7.50E-01
Eu-154	4.76E+05	0.00	0.00	2.96E-06	79.56	1.67E-04
		0.99	1.00	1.77E-05		1
			Adjusted Gross DCGL	55824	dpm/100cm²	

Hot Cell Equipment #7 Smear

Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	1.22E+05	1.09E+05	5.49E+01	1.09E+05	27.24%	1.00	8.20E-06
H-3	9.10E+06	1.63E+05	6.91E+02	1.63E+05	40.73%	1.50	1.64E-07
Co-60	1.83E+05	6.08E+03	2.03E+01	6.08E+03	1.52%	N/A	N/A
Sr-90	3.31E+04	1.22E+05	3.47E+02	1.22E+05	30.49%	N/A	N/A
Eu-154	4.76E+05	0.00E+00	7.95E+01	7.95E+01	0.02%	N/A	N/A
				4.00E+05	100.00%		

Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	1.20E+05	0.27	0.46	2.28E-06	23,539.34	1.97E-01
Co-60	1.83E+05	0.02	0.03	8.30E-08	1,313.02	7.17E-03
Sr-90	3.31E+04	0.30	0.51	9.21E-06	26,346.78	7.96E-01
Eu-154	4.76E+05	0.00	0.00	4.17E-10	17.17	3.61E-05
		0.59	1.00	1.16E-05		1
			Adjusted Gross DCGL	51216	dpm/100cm²	

Hot Cell #1 Surface Smear

Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	1.22E+05	8.03E+05	1.25E+02	8.03E+05	37.17%	1.00	8.20E-06
H-3	9.10E+06	5.43E+04	4.01E+02	5.43E+04	2.51%	0.07	7.43E-09
Co-60	1.83E+05	5.16E+04	5.16E+01	5.16E+04	2.39%	N/A	N/A
Sr-90	3.31E+04	1.25E+06	2.72E+02	1.25E+06	57.87%	N/A	N/A
Eu-154	4.76E+05	1.18E+03	1.44E+02	1.18E+03	0.05%	N/A	N/A
				2.16E+06	100.00%		

Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	1.22E+05	0.37	0.38	3.05E-06	17,989.67	1.48E-01
Co-60	1.83E+05	0.02	0.02	1.31E-07	1,156.00	6.32E-03
Sr-90	3.31E+04	0.58	0.59	1.75E-05	28,003.84	8.46E-01
Eu-154	4.76E+05	0.00	0.00	1.15E-09	26.44	5.55E-05
		0.97	1.00	2.07E-05		1
			Adjusted Gross DCGL	47176	dpm/100cm²	

Hot Cell #2 Surface Smear

Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	1.22E+05	1.09E+05	6.47E+01	1.09E+05	42.68%	1.00	8.20E-06
H-3	9.10E+06	1.09E+04	5.33E+02	1.09E+04	4.27%	0.10	1.10E-08
Co-60	1.83E+05	2.01E+04	3.13E+01	2.01E+04	7.87%	N/A	N/A
Sr-90	3.31E+04	1.15E+05	3.29E+02	1.15E+05	45.03%	N/A	N/A
Eu-154	4.76E+05	4.07E+02	7.91E+01	4.07E+02	0.16%	N/A	N/A
				2.55E+05	100.00%		

Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	1.22E+05	0.43	0.45	3.50E-06	24,332.25	2.00E-01
Co-60	1.83E+05	0.08	0.08	4.30E-07	4,486.96	2.45E-02
Sr-90	3.31E+04	0.45	0.47	1.36E-05	25,671.64	7.76E-01
Eu-154	4.76E+05	0.00	0.00	3.35E-09	90.88	1.91E-04
		0.96	1.00	1.75E-05		1
			Adjusted Gross DCGL	54582	dpm/100cm²	

Hot Cell #3 Surface Smear

Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	1.22E+05	3.57E+03	9.55E+00	3.57E+03	55.36%	1.00	8.20E-06
H-3	9.10E+06	1.71E+01	2.26E+02	2.26E+02	3.50%	0.06	6.96E-09
Co-60	1.83E+05	3.87E+02	8.70E+00	3.87E+02	6.00%	N/A	N/A
Sr-90	3.31E+04	2.24E+03	3.67E+02	2.24E+03	34.73%	N/A	N/A
Eu-154	4.76E+05	5.35E+00	2.59E+01	2.59E+01	0.40%	N/A	N/A
				6.45E+03	100.00%		

Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	1.22E+05	0.55	0.57	4.54E-06	36,013.31	2.95E-01
Co-60	1.83E+05	0.06	0.06	3.28E-07	3,903.96	2.13E-02
Sr-90	3.31E+04	0.35	0.36	1.05E-05	22,596.56	6.83E-01
Eu-154	4.76E+05	0.00	0.00	8.44E-09	261.27	5.49E-04
		0.96	1.00	1.54E-05		1
			Adjusted Gross DCGL	62775	dpm/100cm²	

Hot Cell #4 Surface Smear

Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	1.22E+05	5.87E+03	1.17E+01	5.87E+03	51.16%	1.00	8.20E-06
H-3	9.10E+06	6.17E+02	4.37E+02	6.17E+02	5.38%	0.11	1.18E-08
Co-60	1.83E+05	2.70E+02	5.70E+00	2.70E+02	2.35%	N/A	N/A
Sr-90	3.31E+04	4.70E+03	3.00E+02	4.70E+03	40.96%	N/A	N/A
Eu-154	4.76E+05	1.78E+00	1.69E+01	1.69E+01	0.15%	N/A	N/A
				1.15E+04	100.00%		

Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	1.22E+05	0.51	0.54	4.20E-06	30,622.77	2.51E-01
Co-60	1.83E+05	0.02	0.02	1.29E-07	1,406.54	7.70E-03
Sr-90	3.31E+04	0.41	0.43	1.24E-05	24,519.08	7.41E-01
Eu-154	4.76E+05	0.00	0.00	3.09E-09	88.16	1.85E-04
		0.95	1.00	1.67E-05		1
			Adjusted Gross DCGL	56639	dpm/100cm²	

Hot Cell #5 Surface Smear

Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	1.22E+05	1.75E+04	1.70E+01	1.75E+04	73.97%	1.00	8.20E-06
H-3	9.10E+06	3.32E+01	3.17E+02	3.17E+02	1.34%	0.02	1.89E-09
Co-60	1.83E+05	1.53E+02	9.69E+00	1.53E+02	0.65%	N/A	N/A
Sr-90	3.31E+04	5.66E+03	3.56E+02	5.66E+03	23.92%	N/A	N/A
Eu-154	4.76E+05	2.62E+00	2.75E+01	2.75E+01	0.12%	N/A	N/A
				2.37E+04	100.00%		

Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	1.22E+05	0.74	0.75	6.06E-06	55,490.68	4.55E-01
Co-60	1.83E+05	0.01	0.01	3.53E-08	485.15	2.65E-03
Sr-90	3.31E+04	0.24	0.24	7.23E-06	17,947.27	5.42E-01
Eu-154	4.76E+05	0.00	0.00	2.44E-09	87.20	1.83E-04
		0.99	1.00	1.33E-05		1
			Adjusted Gross DCGL	74010	dpm/100cm²	

Hot Cell #6 Surface Smear

Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	1.22E+05	8.19E+04	2.75E+01	8.19E+04	67.50%	1.00	8.20E-06
H-3	9.10E+06	4.47E+02	2.44E+02	4.47E+02	0.37%	0.01	6.00E-10
Co-60	1.83E+05	1.44E+03	9.69E+00	1.44E+03	1.19%	N/A	N/A
Sr-90	3.31E+04	3.75E+04	2.89E+02	3.75E+04	30.91%	N/A	N/A
Eu-154	4.76E+05	0.00E+00	4.01E+01	4.01E+01	0.03%	N/A	N/A
				1.21E+05	100.00%		

Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	1.22E+05	0.68	0.68	5.53E-06	45,192.58	3.70E-01
Co-60	1.83E+05	0.01	0.01	6.49E-08	794.59	4.34E-03
Sr-90	3.31E+04	0.31	0.31	9.34E-06	20,692.58	6.25E-01
Eu-154	4.76E+05	0.00	0.00	6.94E-10	22.13	4.65E-05
		1.00	1.00	1.49E-05		1
			Adjusted Gross DCGL	66702	dpm/100cm²	

Hot Cell #7 Surface Smear

Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	1.22E+05	3.95E+04	2.40E+01	3.95E+04	84.66%	1.00	8.20E-06
H-3	9.10E+06	6.81E+02	2.44E+02	6.81E+02	1.46%	0.02	1.89E-09
Co-60	1.83E+05	5.30E+02	9.30E+00	5.30E+02	1.14%	N/A	N/A
Sr-90	3.31E+04	5.91E+03	2.95E+02	5.91E+03	12.67%	N/A	N/A
Eu-154	4.76E+05	1.31E+01	3.46E+01	3.46E+01	0.07%	N/A	N/A
				4.67E+04	100.00%		

Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	1.22E+05	0.85	0.86	6.94E-06	78,161.48	6.41E-01
Co-60	1.83E+05	0.01	0.01	6.21E-08	1,048.75	5.73E-03
Sr-90	3.31E+04	0.13	0.13	3.83E-06	11,694.54	3.53E-01
Eu-154	4.76E+05	0.00	0.00	1.56E-09	68.47	1.44E-04
		0.99	1.00	1.08E-05		1
			Adjusted Gross DCGL	90973	dpm/100cm²	

Hot Cell Mean Distribution

Surrogate

	DCGL (dpm/100cm²)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	1.22E+05	53.11%	1.00	8.20E-06
H-3	9.10E+06	10.84%	0.20	2.24E-08
Co-60	1.83E+05	3.41%	N/A	N/A
Sr-90	3.31E+04	32.52%	N/A	N/A
Eu-154	4.76E+05	0.12%	N/A	N/A
		100.00%		

Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	1.22E+05	0.53	0.60	4.37E-06	36,936.49	3.04E-01
Co-60	1.83E+05	0.03	0.04	1.67E-07	2,373.81	1.30E-02
Sr-90	3.31E+04	0.33	0.36	9.83E-06	22,616.35	6.83E-01
Eu-154	4.76E+05	0.00	0.00	2.43E-09	80.31	1.69E-04
		0.89	1.00	1.44E-05		1
			Adjusted Gross DCGL	62007	dpm/100cm²	

	Mean Conc (pCi/filter)	Mean Distribution	Std Deviation
Cs-137	1.85E+05	53.11%	21.35%
H-3	6.28E+04	10.84%	19.01%
Co-60	2.63E+04	3.41%	3.15%
Sr-90	1.84E+05	32.52%	13.97%
Eu-154	2.84E+02	0.12%	0.10%
		100.00%	

Area	
Hot Cell Equipment #1 Smear	57577
Hot Cell Equipment #2 Smear	68725
Hot Cell Equipment #3 Smear	52849
Hot Cell Equipment #4 Smear	63166
Hot Cell Equipment #5 Smear	92553
Hot Cell Equipment #6 Smear	55824
Hot Cell Equipment #7 Smear	51216
Hot Cell #1 Surface Smear	47176
Hot Cell #2 Surface Smear	54582
Hot Cell #3 Surface Smear	62775
Hot Cell #4 Surface Smear	56639
Hot Cell #5 Surface Smear	74010
Hot Cell #6 Surface Smear	66702
Hot Cell #7 Surface Smear	90973
Hot Cell Mean Distribution	62007
Mean	63912
Median	60176
Minimum	47176
Maximum	92553
Standard Deviation	13858

BALANCE OF PLANT

Quad A Smear
Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	1.22E+05	1.22E+02	9.49E+00	1.22E+02	0.14%	1.00	8.20E-06
H-3	9.10E+06	8.07E+04	5.22E+02	8.07E+04	95.25%	661.48	7.27E-05
I-129	1.49E+04	5.06E+00	1.57E+01	1.57E+01	0.02%	0.13	8.64E-06
Co-60	1.83E+05	3.78E+03	7.07E+00	3.78E+03	4.46%	N/A	N/A
Sr-90	3.31E+04	7.93E+01	8.56E+00	7.93E+01	0.09%	N/A	N/A
Eu-154	4.76E+05	0.00E+00	2.31E+01	2.31E+01	0.03%	N/A	N/A
				8.47E+04	100.00%		

Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	1.12E+04	0.00	0.03	1.29E-07	3,585.93	3.21E-01
Co-60	1.83E+05	0.04	0.94	2.44E-07	111,105.03	6.07E-01
Sr-90	3.31E+04	0.00	0.02	2.83E-06	2,330.85	7.04E-02
Eu-154	4.76E+05	0.00	0.01	5.73E-10	678.98	1.43E-03
		0.05	1.00	4.02E-07		1
		Adjusted Gross DCGL		117701	dpm/100cm²	

Quad C Smear
Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	1.22E+05	7.44E+01	1.02E+01	7.44E+01	0.17%	1.00	6.20E-06
H-3	9.10E+06	3.90E+04	3.57E+02	3.90E+04	89.33%	524.19	5.76E-05
I-129	1.49E+04	3.62E+00	1.35E+01	1.35E+01	0.03%	0.18	1.22E-05
Co-60	1.83E+05	4.50E+03	7.40E+00	4.50E+03	10.31%	N/A	N/A
Sr-90	3.31E+04	4.27E+01	9.20E+00	4.27E+01	0.10%	N/A	N/A
Eu-154	4.76E+05	0.00E+00	2.63E+01	2.63E+01	0.06%	N/A	N/A
				4.37E+04	100.00%		

Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	1.28E+04	0.00	0.02	1.33E-07	2,344.26	1.83E-01
Co-60	1.83E+05	0.10	0.97	5.63E-07	141,790.17	7.75E-01
Sr-90	3.31E+04	0.00	0.01	2.95E-08	1,345.43	4.06E-02
Eu-154	4.76E+05	0.00	0.01	1.27E-09	828.68	1.74E-03
		0.11	1.00	7.27E-07		1
		Adjusted Gross DCGL		146309	dpm/100cm²	

Canal E Smear
Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	1.22E+05	1.44E+02	1.23E+01	1.44E+02	0.26%	1.00	8.20E-06
H-3	9.10E+06	4.81E+04	4.14E+02	4.81E+04	85.89%	334.03	3.67E-05
I-129	1.49E+04	3.74E+00	1.88E+01	1.88E+01	0.03%	0.13	8.76E-06
Co-60	1.83E+05	7.61E+03	9.32E+00	7.61E+03	13.59%	N/A	N/A
Sr-90	3.31E+04	1.02E+02	8.25E+00	1.02E+02	0.18%	N/A	N/A
Eu-154	4.76E+05	0.00E+00	2.77E+01	2.77E+01	0.05%	N/A	N/A
				5.60E+04	100.00%		

Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	1.86E+04	0.00	0.02	1.38E-07	2,745.35	1.47E-01
Co-60	1.83E+05	0.14	0.97	7.43E-07	145,084.34	7.93E-01
Sr-90	3.31E+04	0.00	0.01	5.50E-08	1,944.63	5.88E-02
Eu-154	4.76E+05	0.00	0.00	1.04E-09	528.10	1.11E-03
		0.14	1.00	9.37E-07		1
		Adjusted Gross DCGL		150302	dpm/100cm²	

Lilly Pad Smear
Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	1.22E+05	1.39E+01	4.05E+00	1.39E+01	0.21%	1.00	8.20E-06
H-3	9.10E+06	6.42E+03	3.09E+02	6.42E+03	95.41%	461.87	5.08E-05
I-129	1.49E+04	1.54E+01	2.21E+01	2.21E+01	0.33%	1.59	1.07E-04
Co-60	1.83E+05	2.53E+02	4.03E+00	2.53E+02	3.76%	N/A	N/A
Sr-90	3.31E+04	9.77E+00	8.11E+00	9.77E+00	0.15%	N/A	N/A
Eu-154	4.76E+05	1.43E+00	1.04E+01	1.04E+01	0.15%	N/A	N/A
				6.73E+03	100.00%		

Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	6.04E+03	0.00	0.05	3.42E-07	3,473.11	5.75E-01
Co-60	1.83E+05	0.04	0.88	2.05E-07	63,215.56	3.45E-01
Sr-90	3.31E+04	0.00	0.03	4.39E-08	2,441.17	7.38E-02
Eu-154	4.76E+05	0.00	0.04	3.25E-09	2,598.58	5.46E-03
		0.04	1.00	5.95E-07		1
		Adjusted Gross DCGL		71728	dpm/100cm²	

CTMT General Area Smear
Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	1.22E+05	3.64E+02	9.38E+00	3.64E+02	0.15%	1.00	8.20E-06
H-3	9.10E+06	2.42E+05	9.07E+02	2.42E+05	98.29%	664.84	7.31E-05
I-129	1.49E+04	-5.02E+00	1.00E+01	1.00E+01	0.00%	0.03	1.84E-06
Co-60	1.83E+05	3.57E+03	6.77E+00	3.57E+03	1.45%	N/A	N/A
Sr-90	3.31E+04	2.42E+02	8.64E+00	2.42E+02	0.10%	N/A	N/A
Eu-154	4.76E+05	0.00E+00	2.06E+01	2.06E+01	0.01%	N/A	N/A
				2.46E+05	100.00%		

Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	1.20E+04	0.00	0.09	1.23E-07	6,373.53	5.30E-01
Co-60	1.83E+05	0.01	0.85	7.92E-08	62,509.60	3.42E-01
Sr-90	3.31E+04	0.00	0.06	2.97E-08	4,237.35	1.28E-01
Eu-154	4.76E+05	0.00	0.00	1.77E-10	364.20	7.65E-04
		0.02	1.00	2.32E-07		1
		Adjusted Gross DCGL		73485	dpm/100cm²	

Rx Building Smear
Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	1.22E+05	4.64E+03	1.02E+01	4.64E+03	26.21%	1.00	8.20E-06
H-3	9.10E+06	1.07E+04	2.89E+01	1.07E+04	60.45%	2.31	2.53E-07
I-129	1.49E+04	1.02E+01	8.17E+00	1.02E+01	0.06%	0.00	1.48E-07
Co-60	1.83E+05	2.38E+02	8.51E+00	2.38E+02	1.34%	N/A	N/A
Sr-90	3.31E+04	2.04E+03	1.44E+01	2.04E+03	11.53%	N/A	N/A
Eu-154	4.76E+05	7.18E+01	1.75E+01	7.18E+01	0.41%	N/A	N/A
				1.77E+04	100.00%		

Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	1.15E+05	0.26	0.66	2.25E-06	45,059.05	3.87E-01
Co-60	1.83E+05	0.01	0.03	7.35E-08	2,311.22	1.26E-02
Sr-90	3.31E+04	0.12	0.29	3.48E-06	19,810.44	5.99E-01
Eu-154	4.76E+05	0.00	0.01	8.52E-09	697.25	1.46E-03
		0.39	1.00	5.82E-06		1
		Adjusted Gross DCGL		67878	dpm/100cm²	

Rx Building Smear Duplicate
Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	1.22E+05	5.63E+03	1.01E+01	5.63E+03	27.05%	1.00	8.20E-06
H-3	9.10E+06	1.05E+04	2.84E+01	1.05E+04	50.44%	1.87	2.05E-07
I-129	1.49E+04	1.94E+01	1.00E+01	1.94E+01	0.09%	0.00	2.31E-07
Co-60	1.83E+05	2.53E+03	7.07E+00	2.53E+03	12.15%	N/A	N/A
Sr-90	3.31E+04	2.04E+03	1.44E+01	2.04E+03	9.80%	N/A	N/A
Eu-154	4.76E+05	9.62E+01	1.59E+01	9.62E+01	0.46%	N/A	N/A
				2.08E+04	100.00%		

Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	1.16E+05	0.27	0.55	2.33E-06	45,307.47	3.91E-01
Co-60	1.83E+05	0.12	0.25	6.64E-07	20,360.20	1.11E-01
Sr-90	3.31E+04	0.10	0.20	2.86E-06	16,416.92	4.86E-01
Eu-154	4.76E+05	0.00	0.01	9.71E-09	774.17	1.63E-03
		0.49	1.00	5.97E-06		1
		Adjusted Gross DCGL		82859	dpm/100cm²	

Rx Building Mean Distribution
Surrogate

	DCGL (dpm/100cm²)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	1.22E+05	7.74%	1.00	8.20E-06
H-3	9.10E+06	82.15%	10.61	1.17E-06
I-129	1.49E+04	0.08%	0.01	7.01E-07
Co-60	1.83E+05	6.72%	N/A	N/A
Sr-90	3.31E+04	3.13%	N/A	N/A
Eu-154	4.76E+05	0.17%	N/A	N/A
		100.00%		

Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	9.94E+04	0.08	0.44	7.79E-07	36,914.15	3.72E-01
Co-60	1.83E+05	0.07	0.38	3.67E-07	32,063.22	1.75E-01
Sr-90	3.31E+04	0.03	0.18	9.47E-07	14,948.04	4.52E-01
Eu-154	4.76E+05	0.00	0.01	3.50E-09	795.52	1.67E-03
		0.18	1.00	2.10E-06		1
		Adjusted Gross DCGL		84721	dpm/100cm²	

	Mean Conc (pCi/filter)	Mean Distribution	Std Deviation
Cs-137	1.57E+03	7.74%	12.91%
H-3	6.25E+04	82.15%	18.93%
I-129	1.57E+01	0.08%	0.11%
Co-60	3.21E+03	6.72%	5.17%
Sr-90	6.51E+02	3.13%	5.17%
Eu-154	3.95E+01	0.17%	0.19%

Area	
Quad A Smear	117701
Quad C Smear	146309
Canal E Smear	150302
Lilly Pad Smear	71728
CTMT General Area Smear	73485
Rx Building Smear	67878
Rx Building Smear Duplicate	82859
Rx Building Mean Distribution	84721
Mean	101466
Median	82859
Minimum	67878
Maximum	150302
Standard Deviation	36058

Reactor Operations & Laboratory Building

ROLB Smear

Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Alpha							
U-233/234	1.20E+06	9.15E+01	3.97E+00	9.15E+01	0.33%	N/A	N/A
U-235/236	9.96E+05	5.82E+00	2.84E+00	5.82E+00	0.02%	N/A	N/A
Beta							
Cs-137	1.22E+05	4.77E+03	1.37E+01	4.77E+03	17.27%	1.00	8.20E-06
H-3	9.10E+06	2.08E+04	5.30E+01	2.08E+04	75.30%	4.36	4.79E-07
I-129	1.49E+04	1.67E+01	1.20E+01	1.67E+01	0.06%	0.00	2.35E-07
Co-60	1.83E+05	4.09E+02	1.16E+01	4.09E+02	1.48%	N/A	N/A
Sr-90	3.31E+04	1.53E+03	1.48E+01	1.53E+03	5.54%	N/A	N/A
				2.76E+04	100.00%		

Adjusted Gross DCGL

Alpha

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
U-233/234	1.20E+06	0.0033	0.94	2.76E-09	1,114,584.5	9.29E-01
U-235/236	9.96E+05	0.0002	0.06	2.12E-10	70,894.88	7.12E-02
		0.00	1.00	2.97E-09		1
		Adjusted Gross DCGL		1185479	dpm/100cm²	

Beta

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	1.12E+05	0.17	0.71	1.54E-06	52,438.66	4.67E-01
Co-60	1.83E+05	0.01	0.06	8.09E-08	4,496.31	2.46E-02
Sr-90	3.31E+04	0.06	0.23	1.67E-06	16,819.85	5.08E-01
		0.24	1.00	3.29E-06		1
		Adjusted Gross DCGL		73755	dpm/100cm²	

ROLB Smear Duplicate

Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Alpha							
U-233/234	1.20E+06	8.52E+01	1.81E+00	8.52E+01	0.31%	N/A	N/A
U-235/236	9.96E+05	4.42E+00	2.24E+00	4.42E+00	0.02%	N/A	N/A
Beta							
Cs-137	1.22E+05	4.77E+03	1.37E+01	4.77E+03	17.30%	1.00	8.20E-06
H-3	9.10E+06	2.08E+04	5.30E+01	2.08E+04	75.46%	4.36	4.79E-07
I-129	1.49E+04	1.67E+01	1.20E+01	1.67E+01	0.06%	0.00	2.35E-07
Co-60	1.83E+05	4.09E+02	1.16E+01	4.09E+02	1.48%	N/A	N/A
Sr-90	3.31E+04	1.48E+03	1.39E+01	1.48E+03	5.37%	N/A	N/A
				2.76E+04	100.00%		

Adjusted Gross DCGL

Alpha

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
U-233/234	1.20E+06	0.0031	0.95	2.58E-09	1,129,406.01	9.41E-01
U-235/236	9.96E+05	0.0002	0.05	1.61E-10	58,591.35	5.88E-02
		0.00	1.00	2.74E-09		1
		Adjusted Gross DCGL		1187999	dpm/100cm²	

Beta

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	1.12E+05	0.17	0.72	1.54E-06	53,324.18	4.75E-01
Co-60	1.83E+05	0.01	0.06	8.11E-08	4,572.24	2.50E-02
Sr-90	3.31E+04	0.05	0.22	1.62E-06	16,545.03	5.00E-01
		0.24	1.00	3.25E-06		1
		Adjusted Gross DCGL		74441	dpm/100cm²	

ROLB Smear 2

Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Alpha							
U-233/234	1.20E+06	1.18E+04	4.93E+00	1.18E+04	67.81%	N/A	N/A
U-235/236	9.96E+05	3.94E+02	3.35E+00	3.94E+02	2.27%	N/A	N/A
Beta							
Cs-137	1.22E+05	2.97E+03	1.14E+01	2.97E+03	17.14%	1.00	8.20E-06
H-3	9.10E+06	-4.98E+02	6.84E+02	6.84E+02	3.95%	0.23	2.53E-06
I-129	1.49E+04	9.63E+02	1.04E+01	9.63E+02	5.55%	0.32	2.18E-05
Co-60	1.83E+05	8.90E+01	8.81E+00	8.90E+01	0.51%	N/A	N/A
Sr-90	3.31E+04	4.81E+02	1.22E+01	4.81E+02	2.72%	N/A	N/A
				1.73E+04	100.00%		

Adjusted Gross DCGL

Alpha

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
U-233/234	1.20E+06	0.6781	0.97	5.65E-07	1,153,486.2	9.61E-01
U-235/236	9.96E+05	0.0227	0.03	2.28E-08	38,606.48	3.88E-02
		0.70	1.00	5.88E-07		1
		Adjusted Gross DCGL		1192093	dpm/100cm²	

Beta

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	3.34E+04	0.17	0.84	5.14E-06	26,544.35	8.56E-01
Co-60	1.83E+05	0.01	0.03	2.80E-08	854.70	4.67E-03
Sr-90	3.31E+04	0.03	0.14	8.38E-07	4,621.99	1.40E-01
		0.20	1.00	6.00E-06		1
		Adjusted Gross DCGL		34021	dpm/100cm²	

ROLB Smear 2 Duplicate

Surrogate

	DCGL (dpm/100cm²)	Results (pCi/filter)	MDA (pCi/filter)	Used (pCi/filter)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Alpha							
U-233/234	1.20E+06	1.11E+04	5.04E+00	1.11E+04	66.82%	N/A	N/A
U-235/236	9.96E+05	4.08E+02	3.28E+00	4.08E+02	2.45%	N/A	N/A
Beta							
Cs-137	1.22E+05	2.90E+03	1.17E+01	2.90E+03	17.44%	1.00	8.20E-06
H-3	9.10E+06	-4.15E+02	6.85E+02	6.85E+02	4.12%	0.24	2.59E-08
I-129	1.49E+04	9.32E+02	1.05E+01	9.32E+02	5.60%	0.32	2.15E-05
Co-60	1.83E+05	9.58E+01	7.77E+00	9.58E+01	0.58%	N/A	N/A
Sr-90	3.31E+04	4.97E+02	1.26E+01	4.97E+02	2.99%	N/A	N/A
				1.66E+04	100.00%		

Adjusted Gross DCGL

Alpha

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
U-233/234	1.20E+06	0.6682	0.96	5.57E-07	1,149,210.9	9.58E-01
U-235/236	9.96E+05	0.0245	0.04	2.46E-08	42,154.96	4.23E-02
		0.69	1.00	5.81E-07		1
		Adjusted Gross DCGL		1191366	dpm/100cm²	

Beta

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	3.36E+04	0.17	0.83	5.19E-06	28,469.25	8.48E-01
Co-60	1.83E+05	0.01	0.03	3.14E-08	939.00	5.13E-03
Sr-90	3.31E+04	0.03	0.14	9.03E-07	4,877.44	1.47E-01
		0.21	1.00	6.13E-06		1
		Adjusted Gross DCGL		34286	dpm/100cm²	

ROLB Mean Distribution

Surrogate

	DCGL (dpm/100cm²)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Alpha				
U-233/234	1.20E+06	33.82%	N/A	N/A
U-235/236	9.96E+05	1.19%	N/A	N/A
Beta				
Cs-137	1.22E+05	17.29%	1.00	8.20E-06
H-3	9.10E+06	39.71%	2.30	2.52E-07
I-129	1.49E+04	2.82%	0.16	1.09E-05
Co-60	1.83E+05	1.01%	N/A	N/A
Sr-90	3.31E+04	4.17%	N/A	N/A
		100.00%		

Adjusted Gross DCGL

Alpha

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
U-233/234	1.20E+06	0.3382	0.97	2.82E-07	1,151,216.1	9.59E-01
U-235/236	9.96E+05	0.0119	0.03	1.19E-08	40,490.67	4.07E-02
		0.35	1.00	2.94E-07		1
		Adjusted Gross DCGL		1191707	dpm/100cm²	

Beta

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	5.18E+04	0.17	0.77	3.35E-06	37,041.79	7.18E-01
Co-60	1.83E+05	0.01	0.05	5.54E-08	2,170.92	1.19E-02
Sr-90	3.31E+04	0.04	0.19	1.26E-06	8,929.96	2.70E-01
		0.22	1.00	4.67E-06		1
		Adjusted Gross DCGL		48143	dpm/100cm²	

	Mean Conc (pCi/filter)	Mean Distribution	Std Deviation
U-233/234	5.76E+03	33.82%	38.68%
U-235/236	2.03E+02	1.19%	1.35%
Cs-137	3.85E+03	17.29%	0.13%
H-3	1.07E+04	39.71%	41.19%
I-129	4.82E+02	2.82%	3.19%
Co-60	2.51E+02	1.01%	0.54%
Sr-90	9.97E+02	4.17%	1.49%
		100.00%	

Area		
ROLB Smear	Alpha	1185479
	Beta	73755
ROLB Smear Duplicate	Alpha	1187999
	Beta	74441
ROLB Smear 2	Alpha	1192093
	Beta	34021
ROLB Smear 2 Duplicate	Alpha	1191366
	Beta	34286
ROLB Mean Distribution	Alpha	1191707
	Beta	48143
Mean	Alpha	1189234
	Beta	54126
Median	Alpha	1189683
	Beta	54020
Minimum	Alpha	1185479
	Beta	34021
Maximum	Alpha	1192093
	Beta	74441
Standard Deviation	Alpha	3073
	Beta	23064

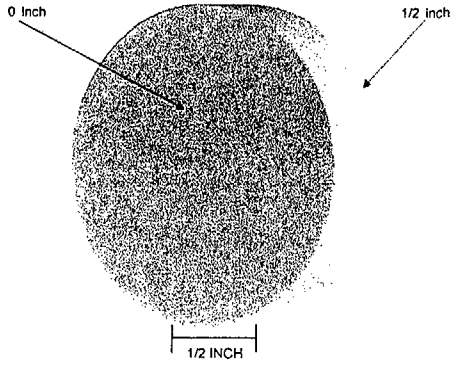
Final Status Survey Plan
for the
Plum Brook Reactor Facility

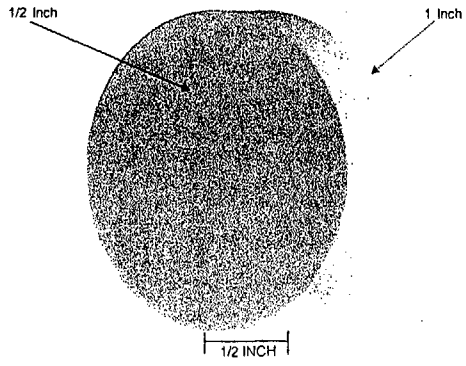
Attachment A
Radionuclide Distribution Basis for DCGL Determination, and Final Status Survey of the Plum Brook Reactor Facility (PBRF)

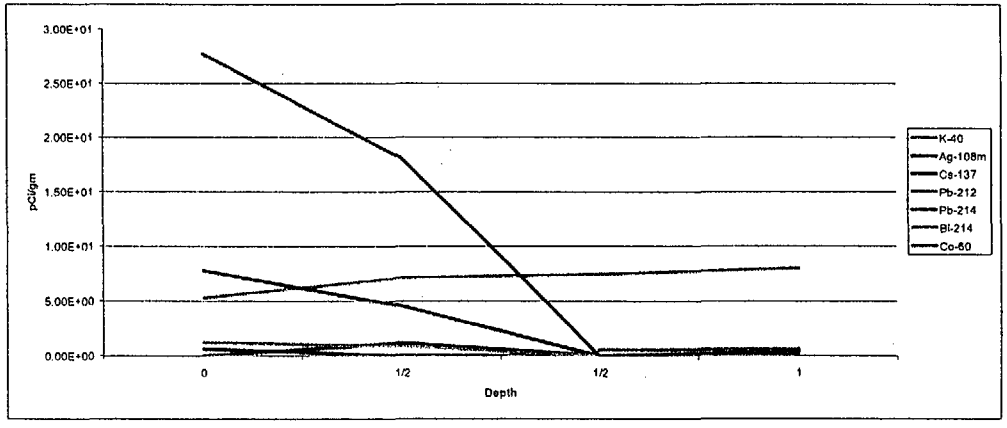
Addendum 2
Preliminary Analysis of Concrete Core "Puck" Samples by the On-Site Laboratory

CORE BORE #5, Reactor Building -25 ft., Area 22

	C9000101I1FL1C1L0505-01 1ST PUCK 0-INCH DEPTH				C9000101I1FL1C1L0505-01A 1ST PUCK 1/2-INCH DEPTH				C9000101I1FL1C1L0505-02 2CND PUCK 1/2-INCH DEPTH				C9000101I1FL1C1L0505-02A 2CND PUCK 1-INCH DEPTH			
	Results	MDA	Used	%	Results	MDA	Used	%	Results	MDA	Used	%	Results	MDA	Used	%
K-40	5.26E+00	1.94E+00	5.26E+00	12.35%	7.10E+00	1.94E+00	7.10E+00	22.27%	7.41E+00	2.02E+00	7.41E+00	93.01%	7.95E+00	2.02E+00	7.95E+00	88.66%
Co-60	2.77E+01	1.97E-01	2.77E+01	64.98%	1.81E+01	1.97E-01	1.81E+01	56.81%	ND		0		ND		0	
Nb-94	ND				ND				ND				ND			
Ag-108m	6.61E-01	3.21E-01	6.61E-01	1.55%	ND		0		ND		0		ND		0	
Cs-137	7.74E+00	3.34E-01	7.74E+00	18.17%	4.56E+00	3.71E-01	4.56E+00	14.31%	ND		0		3.93E-01	2.04E-01	3.93E-01	4.39%
Eu-152	ND				ND				ND				ND			
Eu-154	ND				ND				ND				ND			
Tl-208	ND				ND				ND				ND			
Pb-212	ND				ND				5.57E-01	3.76E-01	5.57E-01	6.99%	6.24E-01	3.91E-01	6.24E-01	6.95%
Pb-214	ND		0		1.21E+00	7.07E-01	1.21E+00	3.79%	ND		0		ND		0	
Bi-212	ND				ND				ND				ND			
Bi-214	1.26E+00	5.26E-01	1.26E+00	2.95%	9.00E-01	5.24E-01	9.00E-01	2.82%	ND		0		ND		0	
Ra-226	ND				ND				ND				ND			
Ac-228	ND				ND				ND				ND			
Th-234	ND				ND				ND				ND			
U-235	ND				ND				ND				ND			
Am-241	ND				ND				ND				ND			
Cm-243	ND				ND				ND				ND			
Cm-245	ND				ND				ND				ND			
			4.26E+01	100.00%			3.19E+01	100.00%			7.96E+00	100.00%			8.97E+00	100.00%

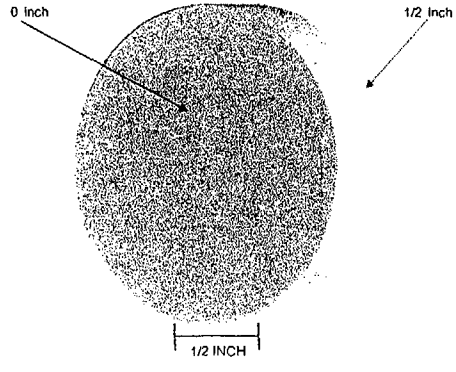


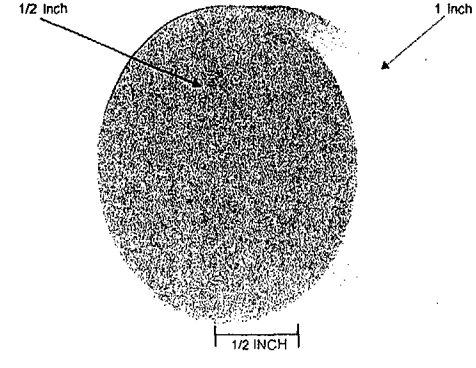


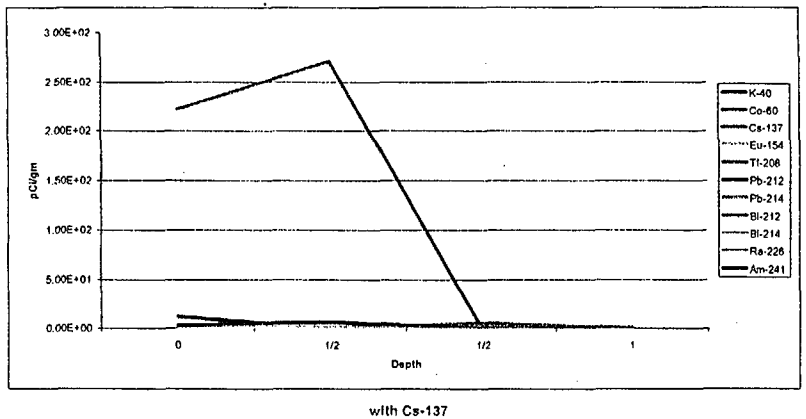


CORE BORE #6, Containment -25 ft, Canal E

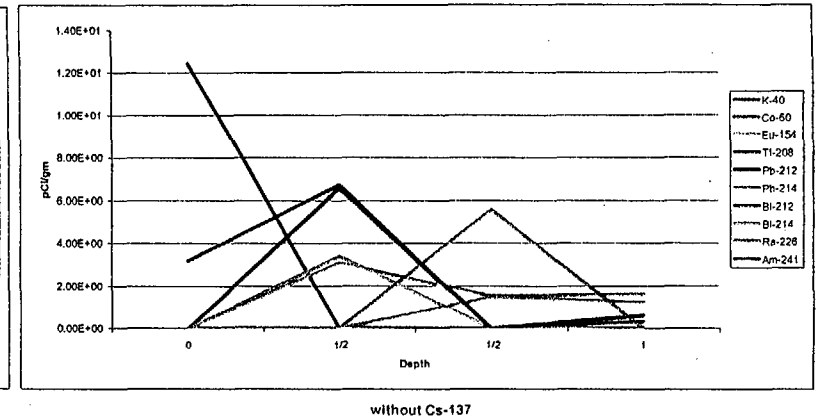
	C9000101I1FL1C3L0506-01 1ST PUCK 0-INCH DEPTH				C9000101I1FL1C3L0506-01A 1ST PUCK 1/2-INCH DEPTH				C9000101I1FL1C3L0506-02 2CND PUCK 1/2-INCH DEPTH				C9000101I1FL1C1L0506-02A 2CND PUCK 1-INCH DEPTH			
	Results	MDA	Used	%	Results	MDA	Used	%	Results	MDA	Used	%	Results	MDA	Used	%
K-40	1.24E+01	2.96E+00	1.24E+01	5.23%	ND		0		ND		0		ND		0	
Co-60	ND		0		6.61E+00	3.00E-01	6.61E+00	2.23%	ND		0		ND		0	
Nb-94	ND				ND				ND				ND			
Ag-108m	ND				ND				ND				ND			
Cs-137	2.22E+02	9.47E-01	2.22E+02	93.43%	2.70E+02	8.92E-01	2.70E+02	91.10%	ND		0		2.58E-01	1.36E-01	2.58E-01	6.23%
Eu-152	ND				ND				ND				ND			
Eu-154	ND		0		3.42E+00	1.62E+00	3.42E+00	1.15%	ND		0		ND		0	
Tl-208	ND		0		ND		0		ND		0		3.29E-01	1.64E-01	3.29E-01	7.96%
Pb-212	ND		0		ND		0		ND		0		6.33E-01	4.58E-01	6.33E-01	15.31%
Pb-214	ND		0		ND		0		1.48E+00	4.98E-01	1.48E+00	17.26%	1.26E+00	4.76E-01	1.26E+00	30.55%
Bi-212	ND		0		6.54E+00	7.08E+00	6.54E+00	2.21%	ND		0		ND		0	
Bi-214	ND		0		3.10E+00	1.67E+00	3.10E+00	1.04%	1.52E+00	2.34E-01	1.52E+00	17.77%	1.65E+00	4.49E-01	1.65E+00	39.98%
Ra-226	ND		0		ND		0		5.57E+00	3.89E+00	5.57E+00	64.97%	ND		0	
Ac-228	ND				ND				ND				ND			
Th-234	ND				ND				ND				ND			
U-235	ND				ND				ND				ND			
Am-241	3.17E+00	1.95E+00	3.17E+00	1.33%	6.75E+00	2.23E+00	6.75E+00	2.27%	ND		0		ND		0	
Cm-243	ND				ND				ND				ND			
Cm-245	ND				ND				ND				ND			
			2.38E+02	100.00%			2.97E+02	100.00%			8.58E+00	100.00%			4.13E+00	100.00%







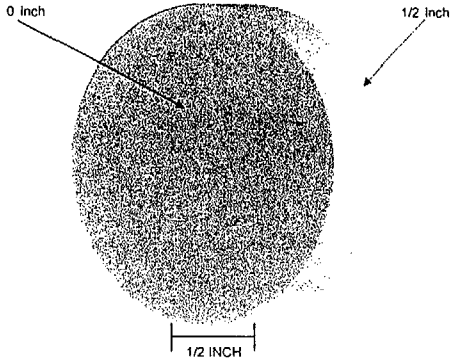
with Cs-137

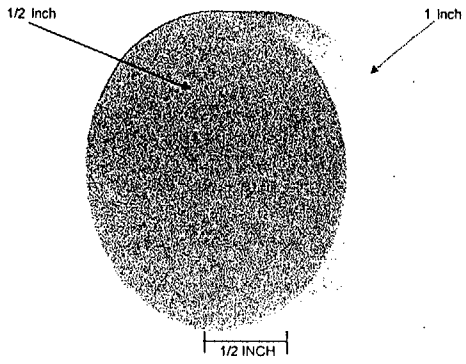


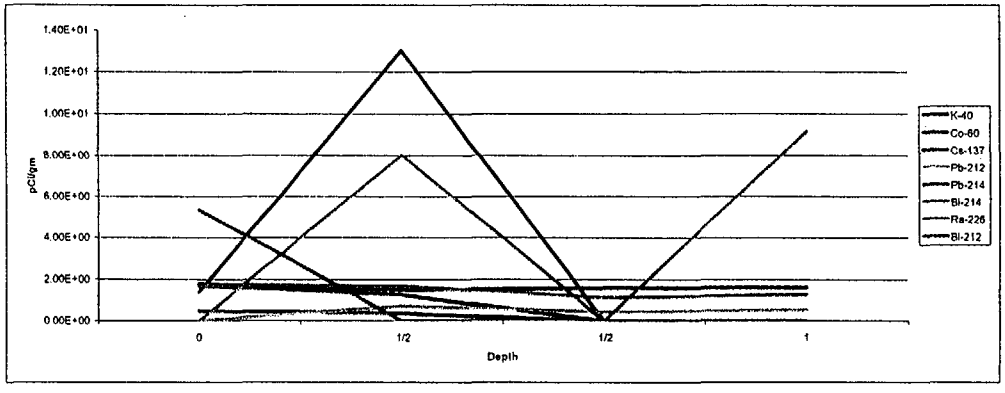
without Cs-137

CORE BORE #7, Reactor Building -15 ft, SE Area

	C9000101I1FL1C1L0507-01 1ST PUCK 0-INCH DEPTH				C9000101I1FL1C1L0507-01A 1ST PUCK 1/2-INCH DEPTH				C9000101I1FL1C1L0507-02 2CND PUCK 1/2-INCH DEPTH				C9000101I1FL1C1L0507-02A 2CND PUCK 1-INCH DEPTH			
	Results	MDA	Used	%	Results	MDA	Used	%	Results	MDA	Used	%	Results	MDA	Used	%
K-40	1.38E+00	3.25E+00	1.38E+00	11.09%	1.30E+01	2.13E+00	1.30E+01	49.03%	ND		0		ND		0	
Co-60	5.02E-01	2.17E-01	5.02E-01	4.04%	3.83E-01	2.17E-01	3.83E-01	1.44%	ND		0		ND		0	
Nb-94	ND				ND				ND				ND			
Ag-108m	ND				ND				ND				ND			
Cs-137	1.69E+00	2.58E-01	1.69E+00	13.57%	1.28E+00	2.06E-01	1.28E+00	4.83%	ND		0		ND		0	
Eu-152	ND				ND				ND				ND			
Eu-154	ND				ND				ND				ND			
Tl-208	ND				ND				ND				ND			
Pb-212	ND		0		7.15E-01	4.35E-01	7.15E-01	2.69%	4.37E-01	4.09E-01	4.37E-01	13.84%	5.28E-01	4.38E-01	5.28E-01	4.19%
Pb-214	1.79E+00	4.03E-01	1.79E+00	14.39%	1.50E+00	4.96E-01	1.50E+00	5.64%	1.60E+00	4.90E-01	1.60E+00	50.72%	1.62E+00	4.79E-01	1.62E+00	12.88%
Bi-212	5.35E+00	1.97E+00	5.35E+00	43.02%	ND		0		ND		0		ND		0	
Bi-214	1.73E+00	4.87E-01	1.73E+00	13.90%	1.67E+00	5.16E-01	1.67E+00	6.27%	1.12E+00	3.47E-01	1.12E+00	35.44%	1.28E+00	3.81E-01	1.28E+00	10.20%
Ra-226	ND		0		8.00E+00	5.84E+00	8.00E+00	30.10%	6.03E+00		0		9.16E+00	4.41E+00	9.16E+00	72.72%
Ac-228	ND				ND				ND				ND			
Th-234	ND				ND				ND				ND			
U-235	ND				ND				ND				ND			
Am-241	ND				ND				ND				ND			
Cm-243	ND				ND				ND				ND			
Cm-245	ND				ND				ND				ND			
			1.24E+01	100.00%			2.66E+01	100.00%			3.16E+00	100.00%			1.26E+01	100.00%

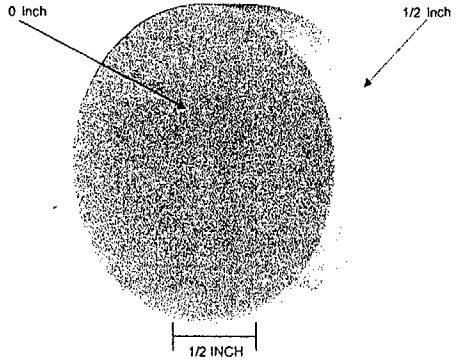


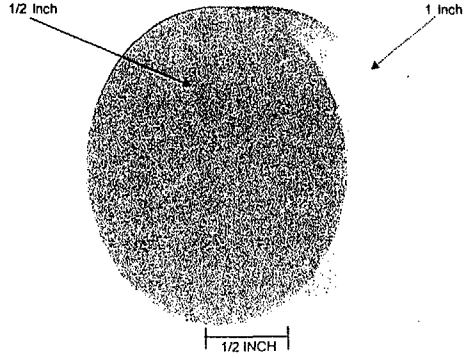


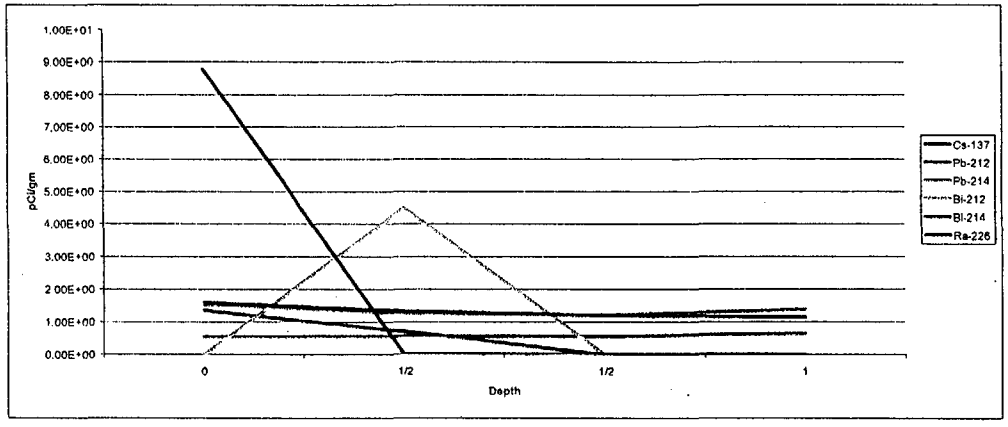


CORE BORE#9, Containment -25 ft, Area 18

	C90001011I1FL1C3L0809-01 1ST PUCK 0-INCH DEPTH				C90001011I1FL1C1L0509-01A 1ST PUCK 1/2-INCH DEPTH				C90001011I1FL1C1L0509-02 2CND PUCK 1/2-INCH DEPTH				C90001011I1FL1C1L0509-02A 2CND PUCK 1-INCH DEPTH			
	Results	MDA	Used	%	Results	MDA	Used	%	Results	MDA	Used	%	Results	MDA	Used	%
K-40	ND				ND				ND				ND			
Co-60	ND				ND				ND				ND			
Nb-94	ND				ND				ND				ND			
Ag-108m	ND				ND				ND				ND			
Cs-137	1.35E+00	2.34E-01	1.35E+00	9.81%	7.11E-01	2.34E-01	7.11E-01	8.52%	1.40E-01		0		ND		0	
Eu-152	ND				ND				ND				ND			
Eu-154	ND				ND				ND				ND			
Tl-208	ND				ND				ND				ND			
Pb-212	5.40E-01	4.27E-01	5.40E-01	3.91%	5.62E-01	4.40E-01	5.62E-01	6.74%	5.58E-01	4.55E-01	5.58E-01	18.70%	6.56E-01	3.42E-01	6.56E-01	20.58%
Pb-214	1.53E+00	4.04E-01	1.53E+00	11.07%	1.25E+00	5.50E-01	1.25E+00	14.95%	1.22E+00	3.51E-01	1.22E+00	40.80%	1.39E+00	4.03E-01	1.39E+00	43.57%
Bi-212	ND		0		4.48E+00	1.94E+00	4.48E+00	53.72%	ND		0		ND		0	
Bi-214	1.59E+00	3.98E-01	1.59E+00	11.53%	1.34E+00	3.44E-01	1.34E+00	16.07%	1.21E+00	4.01E-01	1.21E+00	40.50%	1.14E+00	3.22E-01	1.14E+00	35.85%
Ra-226	8.78E+00	6.08E+00	8.78E+00	63.68%	ND		0		ND		0		ND		0	
Ac-228	ND				ND				ND				ND			
Th-234	ND				ND				ND				ND			
U-235	ND				ND				ND				ND			
Am-241	ND				ND				ND				ND			
Cm-243	ND				ND				ND				ND			
Cm-245	ND				ND				ND				ND			
			1.38E+01	100.00%			8.34E+00	100.00%			2.98E+00	100.00%			3.19E+00	100.00%

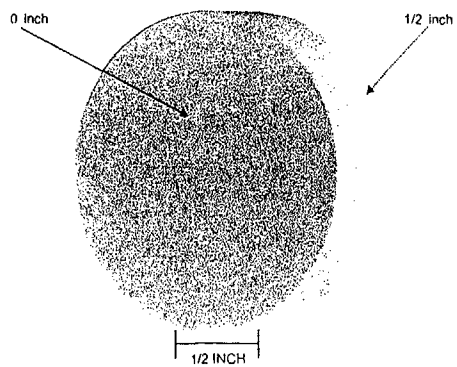


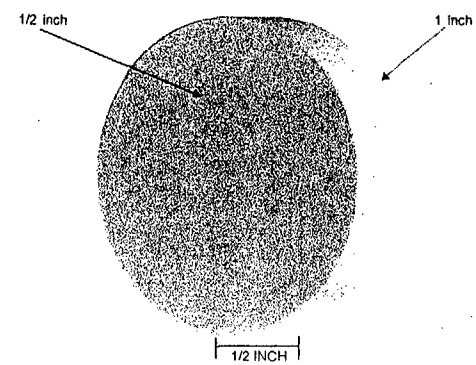


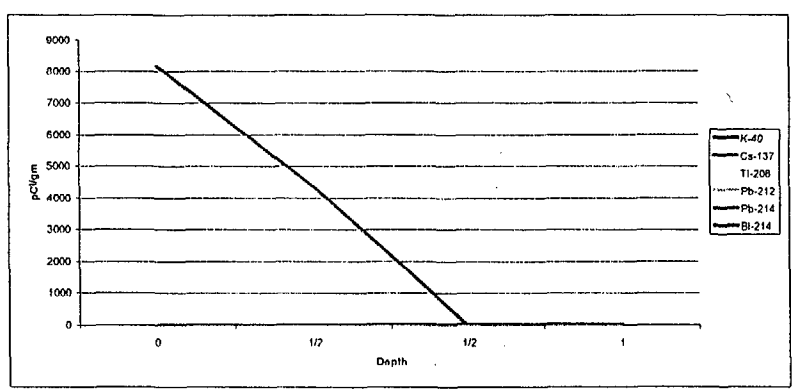


CORE BORE #10, Waste Handling Building -15ft

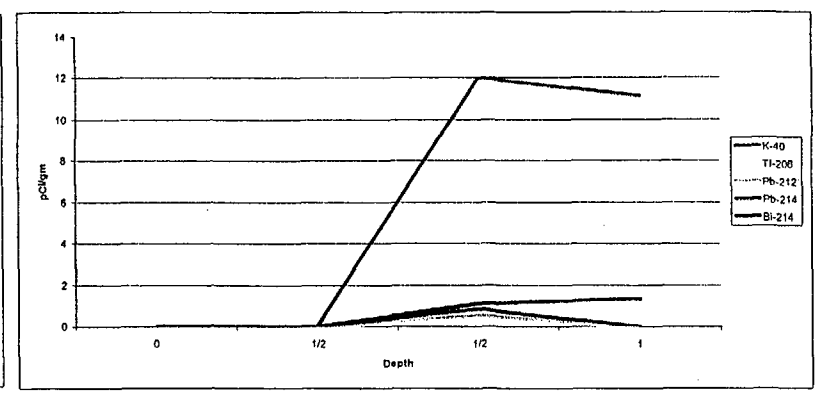
	C90001011I1FL1C3L0510-01 1ST PUCK 0-INCH DEPTH				C90001011I1FL1C3L0510-01A 1ST PUCK 1/2-INCH DEPTH				C90001011I1FL1C1L0510-02 2CND PUCK 1/2-INCH DEPTH				C90001011I1FL1C1L0510-02A 2CND PUCK 1-INCH DEPTH			
	Results	MDA	Used	%	Results	MDA	Used	%	Results	MDA	Used	%	Results	MDA	Used	%
K-40	ND		0		ND		0		1.20E+01	2.10E+00	1.20E+01	78.10%	1.11E+01	2.10E+00	1.11E+01	87.04%
Co-60	ND				ND				ND				ND			
Nb-94	ND				ND				ND				ND			
Ag-108m	ND				ND				ND				ND			
Cs-137	8.17E+03	3.85E+00	8.17E+03	100.00%	4.37E+03	3.40E+00	4.37E+03	100.00%	5.09E-01	2.48E-01	5.09E-01	3.32%	3.21E-01	1.39E-01	3.21E-01	2.51%
Eu-152	ND				ND				ND				ND			
Eu-154	ND				ND				ND				ND			
Tl-208	ND		0		ND		0		3.77E-01	1.26E-01	3.77E-01	2.46%	ND		0	
Pb-212	ND		0		ND		0		5.12E-01	4.16E-01	5.12E-01	3.34%	ND		0	
Pb-214	ND		0		ND		0		8.54E-01	5.05E-01	8.54E-01	5.57%	ND		0	
Bi-212	ND				ND				ND				ND			
Bi-214	ND		0		ND		0		1.11E+00	2.40E-01	1.11E+00	7.22%	1.34E+00	2.40E-01	1.34E+00	10.45%
Ra-226	ND				ND				ND				ND			
Ac-228	ND				ND				ND				ND			
Th-234	ND				ND				ND				ND			
U-235	ND				ND				ND				ND			
Am-241	ND				ND				ND				ND			
Cm-243	ND				ND				ND				ND			
Cm-245	ND				ND				ND				ND			
			8.17E+03	100.00%			4.37E+03	100.00%			1.53E+01	100.00%			1.28E+01	100.00%







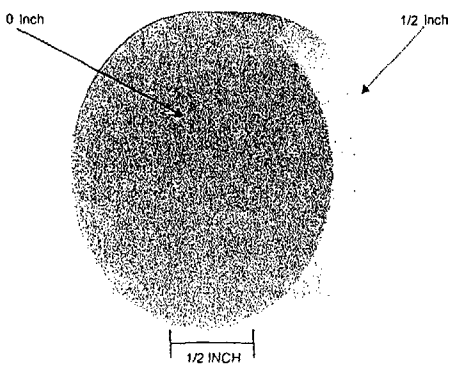
with Cs-137

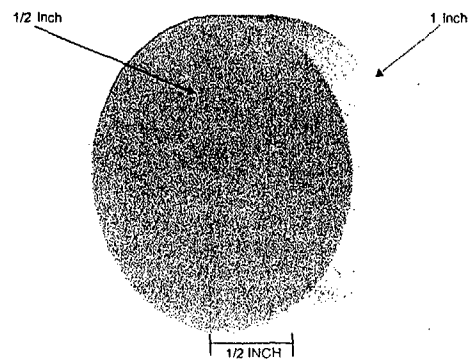


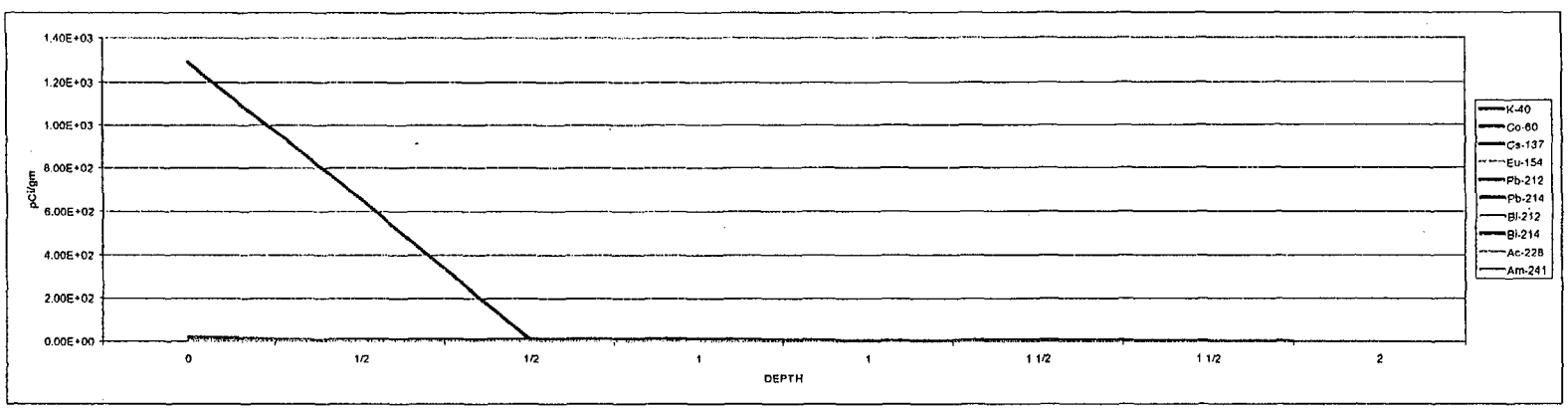
without Cs-137

CORE BORE #11, Hot Laboratory 0 ft (0 Inch to 1 inch)

	C9000101I1FL1C1L0511-01 1ST PUCK 0-INCH DEPTH				C9000101I1FL1C1L0511-01A 1ST PUCK 1/2-INCH DEPTH				C9000101I1FL1C1L0511-02 2CND PUCK 1/2-INCH DEPTH				C9000101I1FL1C1L0511-02A 2CND PUCK 1-INCH DEPTH			
	Results	MDA	Used	%	Results	MDA	Used	%	Results	MDA	Used	%	Results	MDA	Used	%
K-40	6.34E+00	1.87E+00	6.34E+00	0.48%	7.61E+00	1.87E+00	7.61E+00	1.13%	9.76E+00	2.25E+00	9.76E+00	37.03%	1.34E+01	2.25E+00	1.34E+01	49.33%
Co-60	2.83E+00	1.90E-01	2.83E+00	0.21%	1.36E+00	1.90E-01	1.36E+00	0.20%	ND		0		ND		0	
Nb-94	ND				ND				ND				ND			
Ag-108m	ND				ND				ND				ND			
Cs-137	1.29E+03	1.46E+00	1.29E+03	97.38%	6.59E+02	1.22E+00	6.59E+02	98.18%	1.39E+01	2.72E-01	1.39E+01	52.67%	1.18E+01	3.31E-01	1.18E+01	43.44%
Eu-152	ND				ND				ND				ND			
Eu-154	4.71E+00	3.67E+00	4.71E+00	0.36%	ND		0		ND		0		ND		0	
Tl-208	ND				ND				ND				ND			
Pb-212	2.79E+00		0		ND		0		ND		0		9.33E-01	5.29E-01	9.33E-01	3.43%
Pb-214	3.69E+00		0		ND		0		1.45E+00	5.13E-01	1.45E+00	5.52%	1.03E+00	7.41E-01	1.03E+00	3.80%
Bi-212	ND		0		ND		0		ND		0		ND		0	
Bi-214	2.10E+00		0		ND		0		1.26E+00	4.12E-01	1.26E+00	4.78%	ND		0	
Ra-226	ND				ND				ND				ND			
Ac-228	ND		0		ND		0		ND		0		ND		0	
Th-234	ND				ND				ND				ND			
U-235	ND				ND				ND				ND			
Am-241	2.08E+01	3.25E+00	2.08E+01	1.58%	3.26E+00	2.04E+00	3.26E+00	0.49%	ND		0		ND		0	
Cm-243	ND				ND				ND				ND			
Cm-245	ND				ND				ND				ND			
			1.32E+03	100.00%			6.71E+02	100.00%			2.64E+01	100.00%			2.72E+01	100.00%



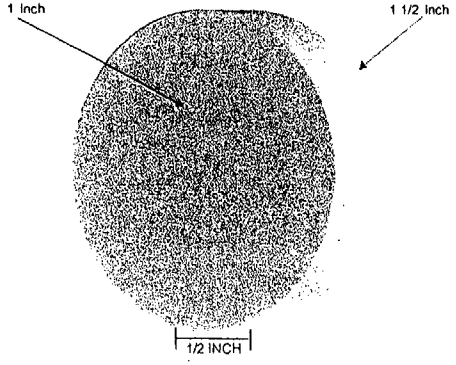


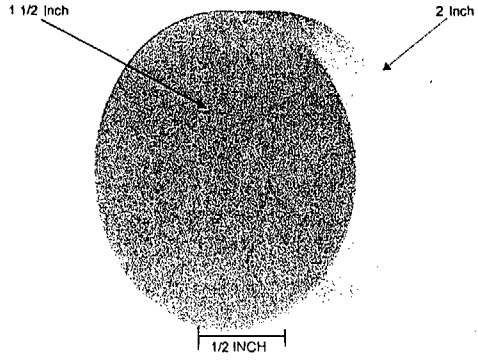


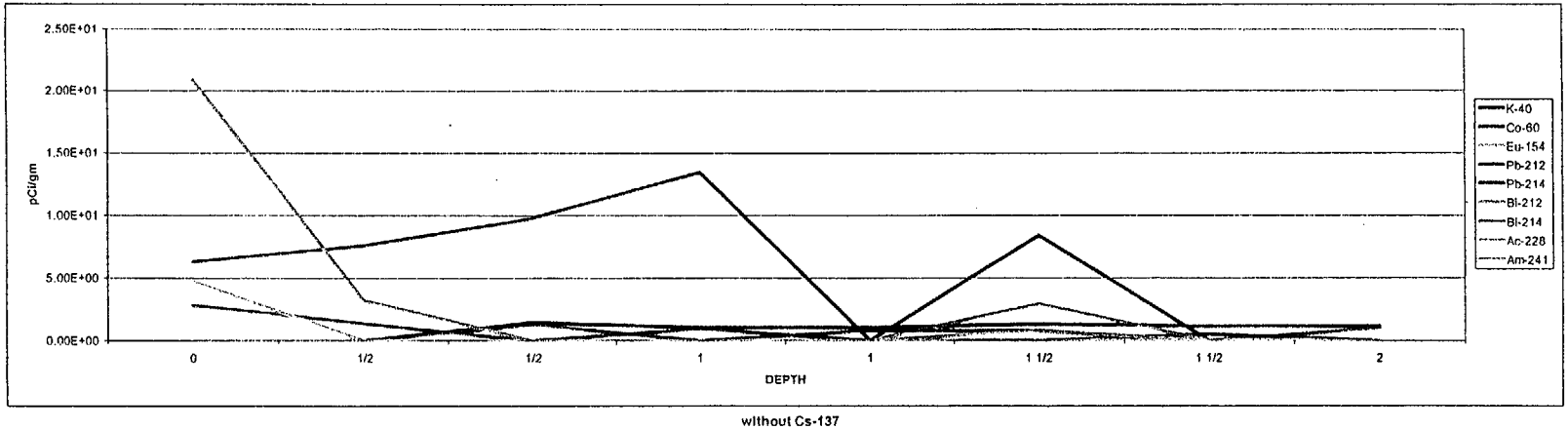
with Cs-137

CORE BORE #11, Hot Laboratory 0 ft (1 inch to 2 inch)

	C9000101I1FL1C1L0511-03 3RD PUCK 1-INCH DEPTH				C9000101I1FL1C1L0511-03A 3RD PUCK 1 1/2-INCH DEPTH				C9000101I1FL1C1L0511-04 4TH PUCK 1 1/2-INCH DEPTH				C9000101I1FL1C1L0511-04A 4TH PUCK 2-INCH DEPTH			
	Results	MDA	Used	%	Results	MDA	Used	%	Results	MDA	Used	%	Results	MDA	Used	%
K-40			0		8.38E+00	2.13E+00	8.38E+00	47.91%			0				0	
Co-60			0				0				0				0	
Nb-94																
Ag-108m																
Cs-137	3.22E+00	2.02E-01	3.22E+00	63.95%	3.29E+00	1.41E-01	3.29E+00	18.82%	1.52E+00	2.06E-01	1.52E+00	47.92%	1.27E+00	2.46E-01	1.27E+00	37.25%
Eu-152																
Eu-154			0				0				0				0	
Tl-208																
Pb-212			0				0		5.03E-01	3.84E-01	5.03E-01	15.87%			0	
Pb-214	1.02E+00	5.60E-01	1.02E+00	20.32%	1.31E+00	4.58E-01	1.31E+00	7.51%	1.15E+00	4.16E-01	1.15E+00	36.21%	1.15E+00	5.19E-01	1.15E+00	33.59%
Bi-212			0		2.94E+00	1.97E+00	2.94E+00	16.80%			0				0	
Bi-214	7.92E-01	2.43E-01	7.92E-01	15.73%	7.48E-01	4.09E-01	7.48E-01	4.27%			0		9.96E-01	3.17E-01	9.96E-01	29.17%
Ra-226																
Ac-228			0		8.22E-01	6.06E-01	8.22E-01	4.70%			0				0	
Th-234																
U-235																
Am-241			0				0				0				0	
Cm-243																
Cm-245																
			5.03E+00	100.00%			1.75E+01	100.00%			3.17E+00	100.00%			3.41E+00	100.00%



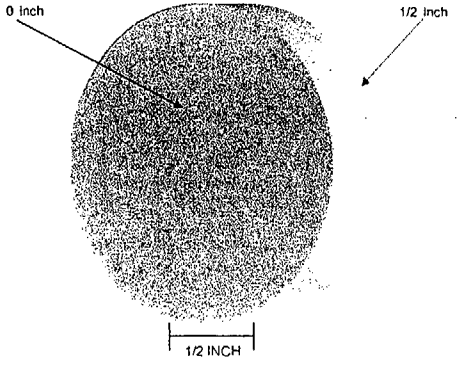


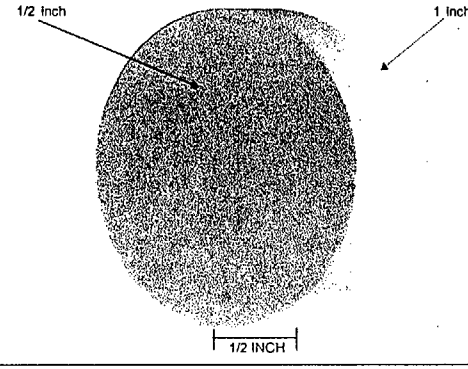


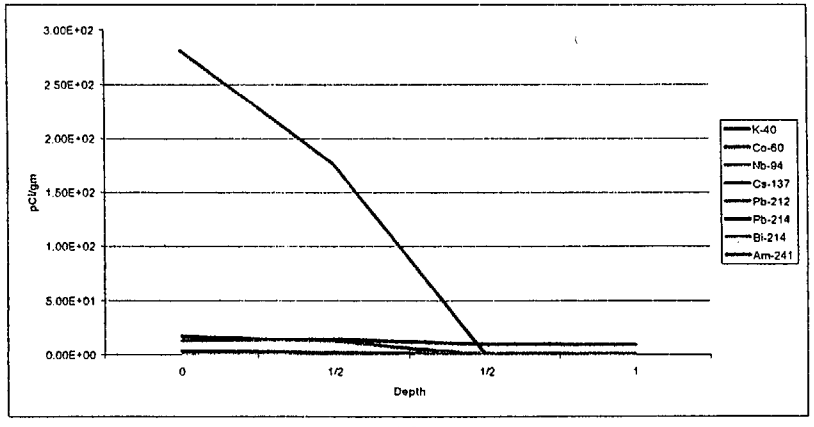
without Cs-137

CORE BORE #12, Hot Laboratory 0 ft

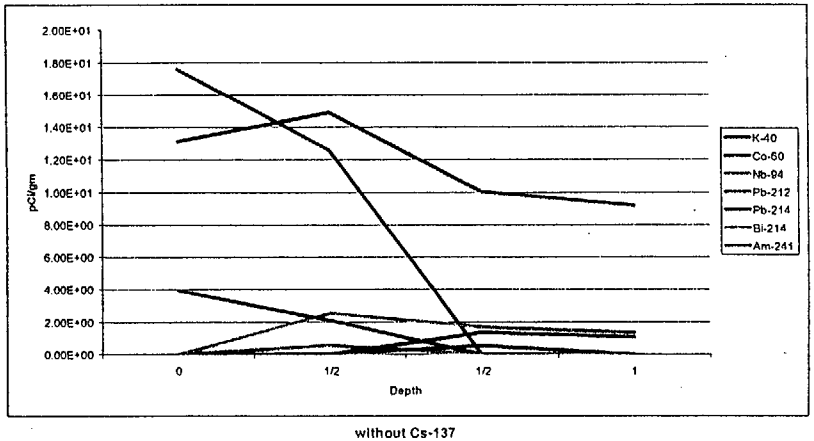
	C9000101I1FL1C3L0512-01 1ST PUCK 0-INCH DEPTH				C9000101I1FL1C1L0512-01A 1ST PUCK 1/2-INCH DEPTH				C9000101I1FL1C1L0512-02 2CND PUCK 1/2-INCH DEPTH				C9000101I1FL1C1L0512-02A 2CND PUCK 1-INCH DEPTH			
	Results	MDA	Used	%	Results	MDA	Used	%	Results	MDA	Used	%	Results	MDA	Used	%
K-40	1.31E+01	2.62E+00	1.31E+01	4.16%	1.49E+01	3.83E+00	1.49E+01	7.13%	1.00E+01	2.11E+00	1.00E+01	71.84%	9.16E+00	2.11E+00	9.16E+00	79.06%
Co-60	1.76E+01	2.66E-01	1.76E+01	5.57%	1.26E+01	2.66E-01	1.26E+01	6.02%	2.15E-01		0		ND		0	
Nb-94	ND		0		5.38E-01	1.85E-01	5.38E-01	0.26%	1.49E-01		0		ND		0	
Ag-108m	ND				ND				ND				ND			
Cs-137	2.81E+02	9.32E-01	2.81E+02	89.02%	1.76E+02	9.92E-01	1.76E+02	84.37%	2.84E-01	1.40E-01	2.84E-01	2.04%	ND		0	
Eu-152	ND				ND				ND				ND			
Eu-154	ND				ND				ND				ND			
Tl-208	ND				ND				ND				ND			
Pb-212	ND		0		ND		0		5.61E-01	3.46E-01	5.61E-01	4.02%	ND		0	
Pb-214	ND		0		2.87E+00	2.26E+00	0		1.38E+00	5.84E-01	1.38E+00	9.88%	1.06E+00	4.13E-01	1.06E+00	9.13%
Bi-212	ND				ND				ND				ND			
Bi-214	ND		0		2.54E+00	1.24E+00	2.54E+00	1.21%	1.71E+00	4.24E-01	1.71E+00	12.22%	1.37E+00	4.06E-01	1.37E+00	11.81%
Ra-226	ND				ND				ND				ND			
Ac-228	ND				ND				ND				ND			
Th-234	ND				ND				ND				ND			
U-235	ND				ND				ND				ND			
Am-241	3.92E+00	1.73E+00	3.92E+00	1.24%	2.11E+00	1.53E+00	2.11E+00	1.01%	ND		0		ND		0	
Cm-243	ND				ND				ND				ND			
Cm-245	ND				ND				ND				ND			
			3.16E+02	100.00%			2.09E+02	100.00%			1.40E+01	100.00%			1.16E+01	100.00%







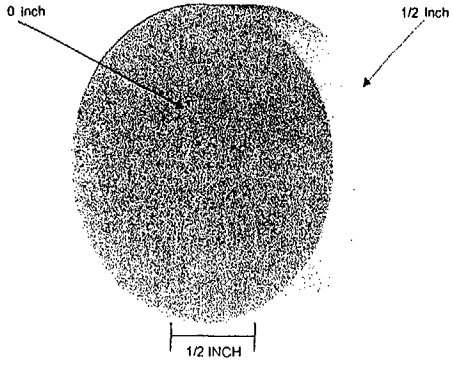
with Cs-137

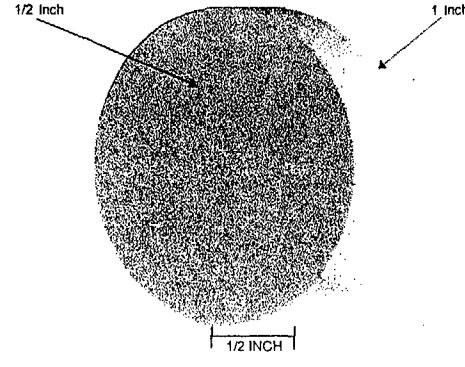


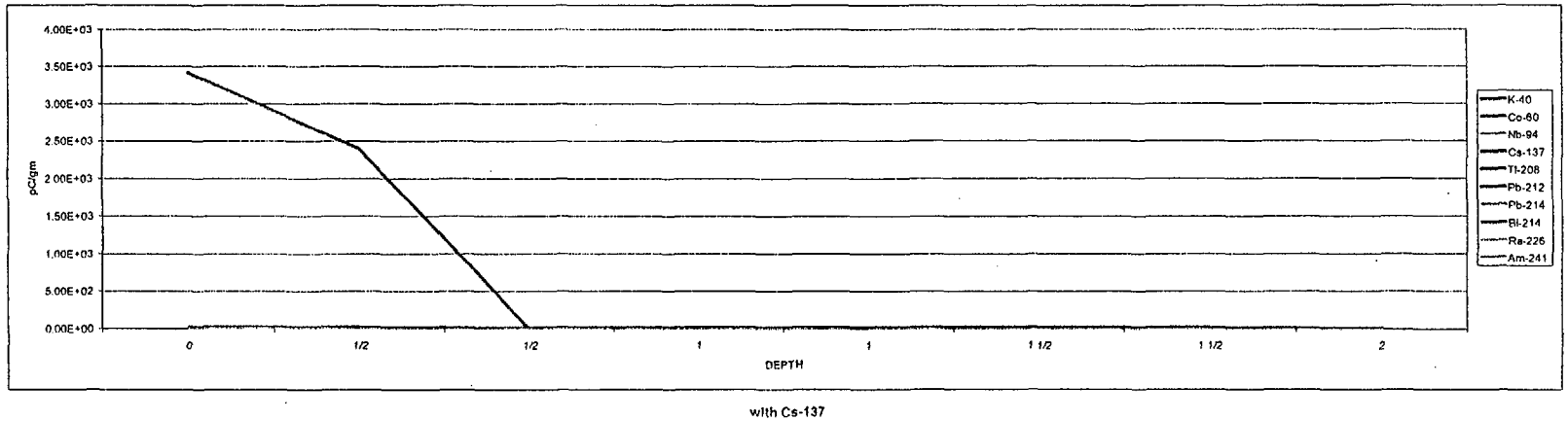
without Cs-137

CORE BORE #13, Hot Laboratory 0 ft (0 inch to 1 inch)

	C9000101I1FL1C3L0513-01 1ST PUCK 0-INCH DEPTH				C9000101I1FL1C1L0513-01A 1ST PUCK 1/2-INCH DEPTH				C9000101I1FL1C1L0513-02 2CND PUCK 1/2-INCH DEPTH				C9000101I1FL1C1L0513-02A 2CND PUCK 1-INCH DEPTH			
	Results	MDA	Used	%	Results	MDA	Used	%	Results	MDA	Used	%	Results	MDA	Used	%
K-40	1.87E+01	2.70E+00	1.87E+01	0.54%	1.28E+01	2.70E+00	1.28E+01	0.53%	9.42E+00	2.24E+00	9.42E+00	63.89%	7.90E+00	2.24E+00	7.90E+00	63.50%
Co-60	*1.28E+00*	2.75E-01	*1.28E+00*	*0.04%*	*8.12E-01*	2.75E-01	*8.12E-01*	*0.03%*	*ND*		*0*		*ND*		*0*	
Nb-94	ND		0		ND		0		2.37E-01	1.58E-01	2.37E-01	1.61%	ND		0	
Ag-108m	ND				ND				ND				ND			
Cs-137	3.41E+03	2.92E+00	3.41E+03	99.17%	2.40E+03	2.77E+00	2.40E+03	99.44%	1.75E+00	1.48E-01	1.75E+00	11.87%	1.09E+00	1.48E-01	1.09E+00	8.73%
Eu-152	ND				ND				ND				ND			
Eu-154	ND				ND				ND				ND			
Tl-208	ND		0		ND		0		ND		0		ND		0	
Pb-212	ND		0		ND		0		ND		0		7.00E-01	4.55E-01	7.00E-01	5.63%
Pb-214	ND		0		ND		0		1.56E+00	6.00E-01	1.56E+00	10.55%	1.16E+00	6.05E-01	1.16E+00	9.31%
Bi-212	ND				ND				ND				ND			
Bi-214	ND		0		ND		0		1.78E+00	4.04E-01	1.78E+00	12.08%	1.60E+00	2.56E-01	1.60E+00	12.83%
Ra-226	ND		*0*		*ND*		*0*		*ND*		*0*		*ND*		*0*	
Ac-228	ND				ND				ND				ND			
Th-234	ND				ND				ND				ND			
U-235	ND				ND				ND				ND			
Am-241	8.58E+00	4.49E+00	8.58E+00	0.25%	ND		0		ND		0		ND		0	
Cm-243	ND				ND				ND				ND			
Cm-245	ND				ND				ND				ND			
			3.44E+03	100.00%			2.42E+03	100.00%			1.48E+01	100.00%			1.24E+01	100.00%



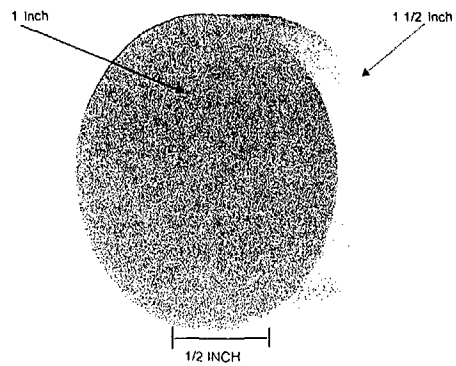


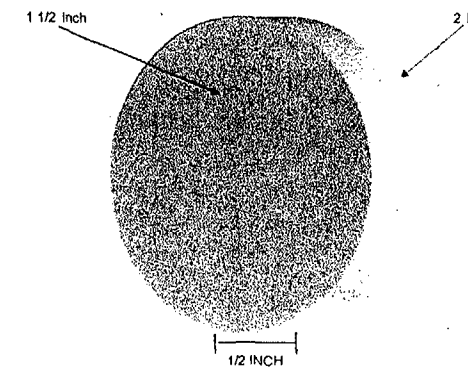


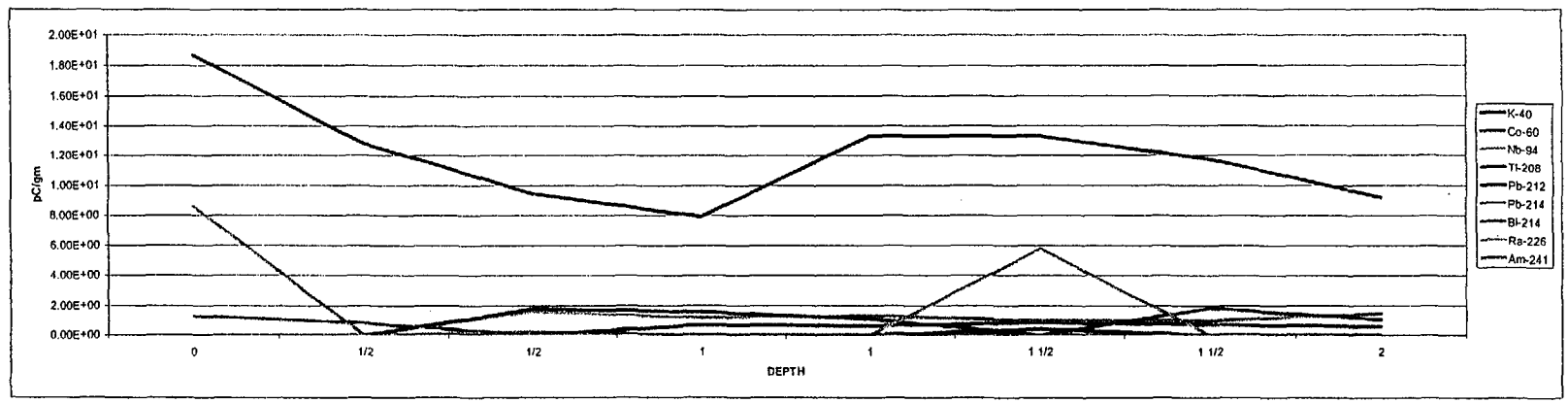
with Cs-137

CORE BORE #13, Hot Laboratory 0 ft (1 inch to 2 Inch)

	C9000101I1FL1C3L0513-03 3RD PUCK 1-INCH DEPTH				C9000101I1FL1C1L0513-03A 3RD PUCK 1 1/2-INCH DEPTH				C9000101I1FL1C1L0513-04 4TH PUCK 1 1/2-INCH DEPTH				C9000101I1FL1C1L0513-04A 4TH PUCK 2-INCH DEPTH			
	Results	MDA	Used	%	Results	MDA	Used	%	Results	MDA	Used	%	Results	MDA	Used	%
K-40	1.33E+01	2.18E+00	1.33E+01	78.43%	1.33E+01	2.16E+00	1.33E+01	60.81%	1.17E+01	2.11E+00	1.17E+01	73.60%	9.16E+00	2.11E+00	9.16E+00	74.59%
Co-60			0				0				0				0	
Nb-94			0				0				0				0	
Ag-108m																
Cs-137	6.01E-01	2.20E-01	6.01E-01	3.54%	5.39E-01	1.97E-01	5.39E-01	2.46%	7.21E-01	1.40E-01	7.21E-01	4.52%			0	
Eu-152																
Eu-154																
Tl-208			0		4.18E-01	1.79E-01	4.18E-01	1.91%			0				0	
Pb-212	6.15E-01	4.66E-01	6.15E-01	3.62%	8.76E-01	3.98E-01	8.76E-01	4.00%	6.91E-01	4.76E-01	6.91E-01	4.33%	5.92E-01	3.27E-01	5.92E-01	4.82%
Pb-214	1.34E+00	4.85E-01	1.34E+00	7.91%	9.67E-01	4.27E-01	9.67E-01	4.42%	9.57E-01	5.26E-01	9.57E-01	6.00%	1.49E+00	4.44E-01	1.49E+00	12.17%
Bi-212																
Bi-214	1.10E+00	4.55E-01	1.10E+00	6.50%			*0*		*1.84E+00*	*0.4177*	*1.84E+00*	11.55%	1.04E+00	3.21E-01	1.04E+00	8.43%
Ra-226			0		5.78E+00	4.30E+00	5.78E+00	26.40%			0				0	
Ac-228																
Th-234																
U-235																
Am-241			0				*0*				0				0	
Cm-243																
Cm-245																
			1.70E+01	100.00%			2.19E+01	100.00%			1.60E+01	100.00%			1.23E+01	100.00%



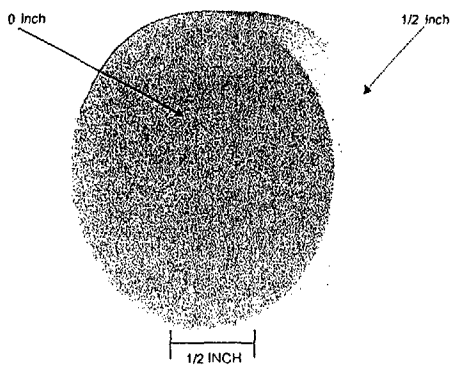


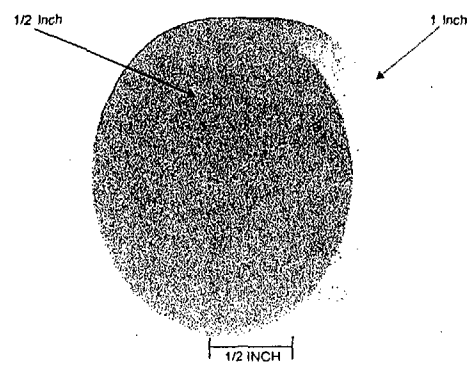


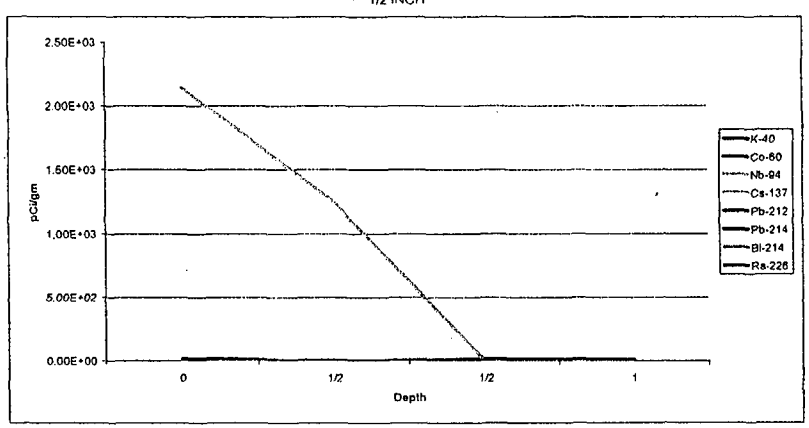
without Cs-137

CORE BORE #14, Hot Laboratory 0 ft

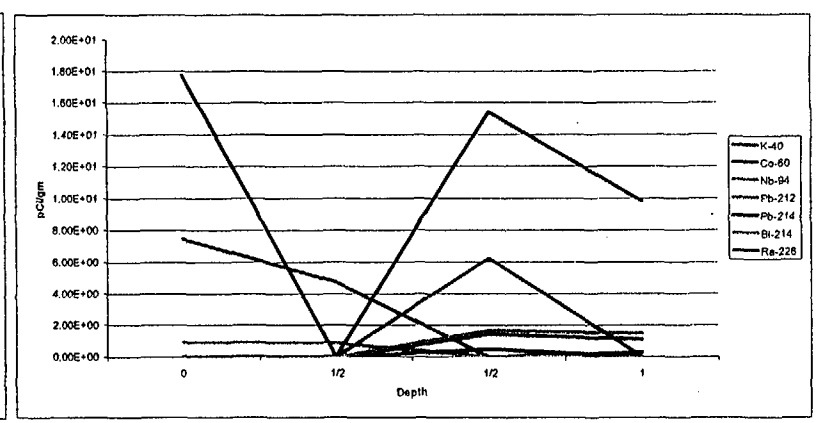
	C90001011I1FL1C3L0514-01 1ST PUCK 0-INCH DEPTH				C90001011I1FL1C1L0514-01A 1ST PUCK 1/2-INCH DEPTH				C90001011I1FL1C1L0514-02 2CND PUCK 1/2-INCH DEPTH				C90001011I1FL1C1L0514-02A 2CND PUCK 1-INCH DEPTH			
	Results	MDA	Used	%	Results	MDA	Used	%	Results	MDA	Used	%	Results	MDA	Used	%
K-40	1.77E+01	2.29E+00	1.77E+01	0.82%	7.58E+00		0		1.54E+01	2.18E+00	1.54E+01	61.13%	9.77E+00	2.18E+00	9.77E+00	77.26%
Co-60	7.49E+00	2.32E-01	7.49E+00	0.35%	4.73E+00	2.32E-01	4.73E+00	0.37%	2.23E-01		0		2.98E-01	2.22E-01	2.98E-01	2.36%
Nb-94	8.98E-01	5.26E-01	8.98E-01	0.04%	8.63E-01	3.77E-01	8.63E-01	0.07%	1.89E-01		0		1.54E-01		0	
Ag-108m	ND				ND				ND				ND			
Cs-137	2.14E+03	2.01E+00	2.14E+03	98.80%	1.26E+03	1.94E+00	1.26E+03	99.56%	1.82E-01		0		1.44E-01		0	
Eu-152	ND				ND				ND				ND			
Eu-154	ND				ND				ND				ND			
Tl-208	ND				ND				ND				ND			
Pb-212	ND		0		ND		0		4.99E-01	3.44E-01	4.99E-01	1.98%	3.72E-01		0	
Pb-214	ND		0		ND		0		1.39E+00	3.34E-01	1.39E+00	5.51%	1.11E+00	6.14E-01	1.11E+00	8.78%
Bi-212	ND				ND				ND				ND			
Bi-214	ND		0		ND		0		1.68E+00	3.49E-01	1.68E+00	6.66%	1.47E+00	6.14E-01	1.47E+00	11.60%
Ra-226	ND		0		ND		0		6.22E+00	4.76E+00	6.22E+00	24.71%	6.19E+00		0	
Ac-228	ND				ND				ND				ND			
Th-234	ND				ND				ND				ND			
U-235	ND				ND				ND				ND			
Am-241	ND				ND				ND				ND			
Cm-243	ND				ND				ND				ND			
Cm-245	ND				ND				ND				ND			
			2.17E+03	100.00%			1.26E+03	100.00%			2.52E+01	100.00%			1.26E+01	100.00%







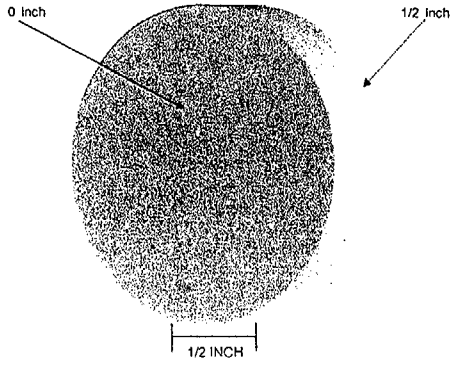
with Cs-137

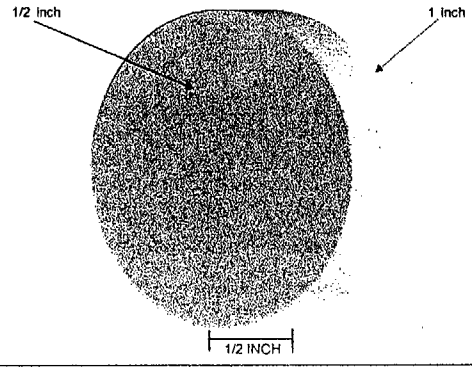


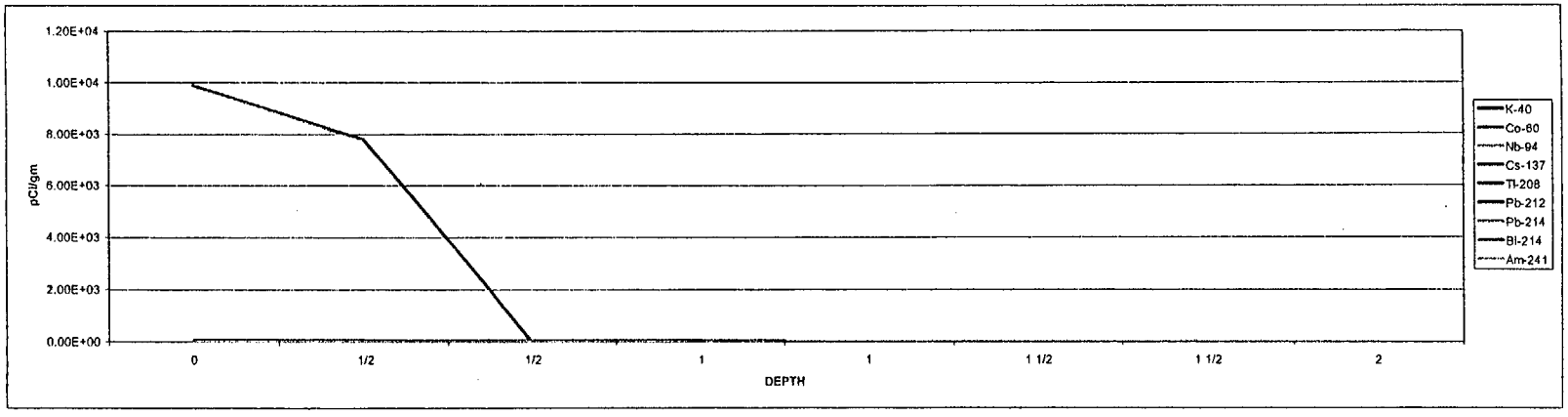
without Cs-137

CORE BORE #15, Hot Laboratory 0 ft (0 inch to 1 inch)

	C9000101I1FL1C1L0515-01 1ST PUCK 0-INCH DEPTH				C9000101I1FL1C1L0515-01A 1ST PUCK 1/2-INCH DEPTH				C9000101I1FL1C1L0515-02 2CND PUCK 1/2-INCH DEPTH				C9000101I1FL1C1L0515-02A 2CND PUCK 1-INCH DEPTH			
	Results	MDA	Used	%	Results	MDA	Used	%	Results	MDA	Used	%	Results	MDA	Used	%
K-40	1.29E+01	2.50E+00	1.29E+01	0.13%	1.76E+01	2.49E+00	1.76E+01	0.22%	1.40E+01	2.10E+00	1.40E+01	46.13%	1.33E+01	2.10E+00	1.33E+01	53.78%
Co-60	7.20E+01	5.02E-01	7.20E+01	0.72%	5.36E+01	2.53E-01	5.36E+01	0.68%	8.69E-01	2.13E-01	8.69E-01	2.87%	8.84E-01	2.13E-01	8.84E-01	3.57%
Nb-94	ND		0		1.10E+00	8.53E-01	1.10E+00	0.01%	ND		0		ND		0	
Ag-108m	ND				ND				ND				ND			
Cs-137	9.87E+03	5.11E+00	9.87E+03	99.05%	7.79E+03	4.90E+00	7.79E+03	98.99%	1.40E+01	4.53E-01	1.40E+01	46.41%	8.28E+00	2.94E-01	8.28E+00	33.40%
Eu-152	ND				ND				ND				ND			
Eu-154	ND				ND				ND				ND			
Tl-208	ND		0		ND		0		ND		0		ND		0	
Pb-212	ND		0		ND		0		ND		0		ND		0	
Pb-214	ND		0		ND		0		1.39E+00	6.27E-01	1.39E+00	4.59%	1.24E+00	7.66E-01	1.24E+00	4.99%
Bl-212	ND				ND				ND				ND			
Bl-214	ND		0		ND		0		ND		0		1.06E+00	6.65E-01	1.06E+00	4.26%
Ra-226	ND				ND				ND				ND			
Ac-228	ND				ND				ND				ND			
Th-234	ND				ND				ND				ND			
U-235	ND				ND				ND				ND			
Am-241	9.63E+00	6.17E+00	9.63E+00	0.10%	7.10E+00	6.51E+00	7.10E+00	0.09%	ND		0		ND		0	
Cm-243	ND				ND				ND				ND			
Cm-245	ND				ND				ND				ND			
			9.96E+03	100.00%			7.87E+03	100.00%			3.03E+01	100.00%			2.48E+01	100.00%



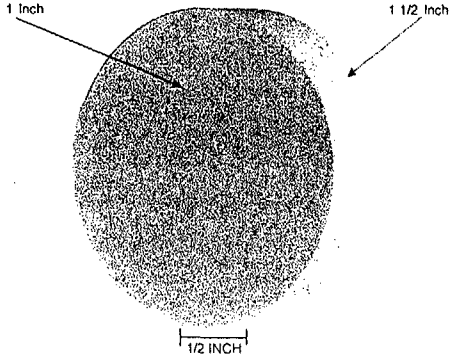


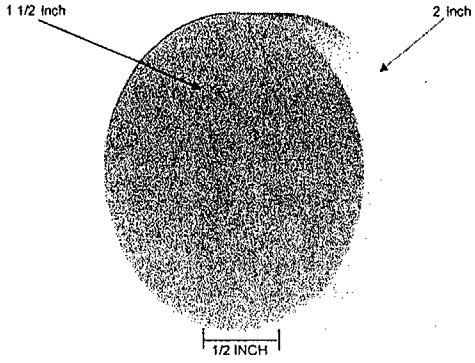


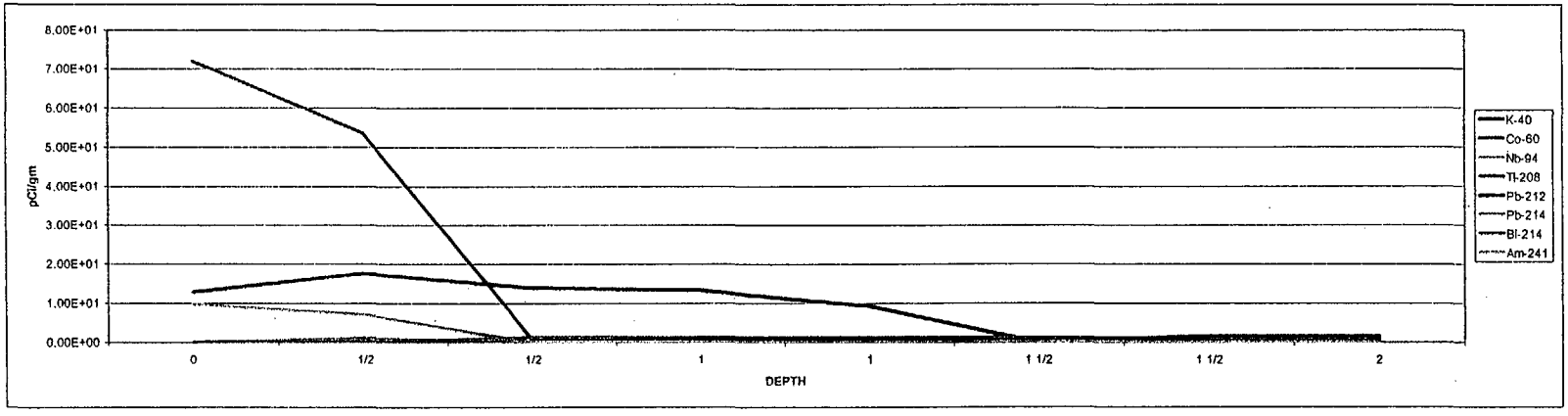
with Cs-137

CORE BORE #15, Hot Laboratory 0 ft (1 inch to 2 inch)

	C9000101I1FL1C1L0515-03 3RD PUCK 1-INCH DEPTH				C9000101I1FL1C1L0515-03A 3RD PUCK 1 1/2-INCH DEPTH				C9000101I1FL1C1L0515-04 4TH PUCK 1 1/2-INCH DEPTH				C9000101I1FL1C1L0515-04A 4TH PUCK 2-INCH DEPTH			
	Results	MDA	Used	%	Results	MDA	Used	%	Results	MDA	Used	%	Results	MDA	Used	%
K-40	9.23E+00	1.79E+00	9.23E+00	79.00%	ND		0		1.15E+00	2.36E+00	1.15E+00	21.46%	1.15E+00	2.36E+00	1.15E+00	21.46%
Co-60	ND		0		ND		0		ND		0		ND		0	
Nb-94	ND		0		ND		0		ND		0		ND		0	
Ag-108m	ND				ND				ND				ND			
Cs-137	3.22E-01	1.18E-01	3.22E-01	2.75%	5.31E-01	1.18E-01	5.31E-01	21.71%	5.95E-01	1.56E-01	5.95E-01	11.05%	5.95E-01	1.56E-01	5.95E-01	11.05%
Eu-152	ND				ND				ND				ND			
Eu-154	ND				ND				ND				ND			
Tl-208	ND		0		2.53E-01	1.70E-01	2.53E-01	10.35%	ND		0		ND		0	
Pb-212	ND		0		ND		0		7.17E-01	5.33E-01	7.17E-01	13.32%	7.17E-01	5.33E-01	7.17E-01	13.32%
Pb-214	1.24E+00	4.83E-01	1.24E+00	10.61%	1.25E+00	3.18E-01	1.25E+00	51.11%	1.19E+00	6.04E-01	1.19E+00	22.18%	1.19E+00	6.04E-01	1.19E+00	22.18%
Bi-212	ND				ND				ND				ND			
Bi-214	8.92E-01	2.93E-01	8.92E-01	7.63%	4.11E-01	2.04E-01	4.11E-01	16.83%	1.72E+00	2.70E-01	1.72E+00	31.98%	1.72E+00	2.70E-01	1.72E+00	31.98%
Ra-226	ND				ND				ND				ND			
Ac-228	ND				ND				ND				ND			
Th-234	ND				ND				ND				ND			
U-235	ND				ND				ND				ND			
Am-241	ND		0		ND		0		ND		0		ND		0	
Cm-243	ND				ND				ND				ND			
Cm-245	ND				ND				ND				ND			
			1.17E+01	100.00%			2.44E+00	100.00%			5.38E+00	100.00%			5.38E+00	100.00%



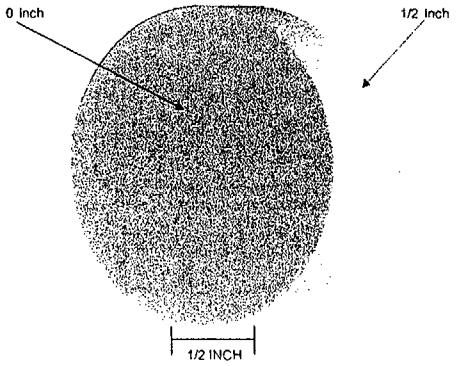


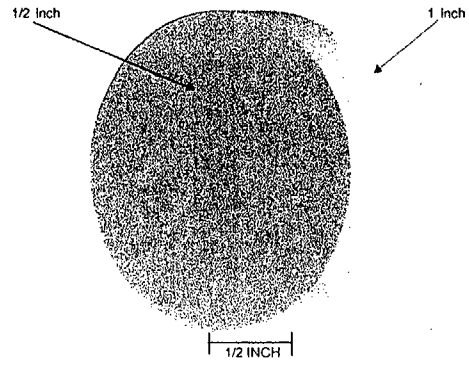


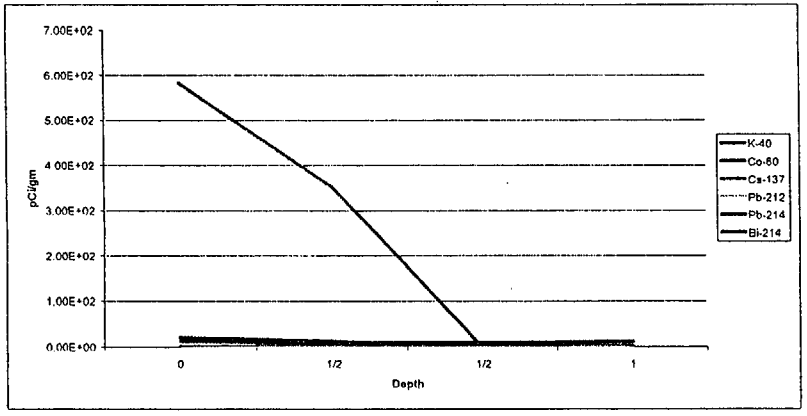
without Cs-137

CORE BORE #16, Hot Pipe Tunnel, -12 ft

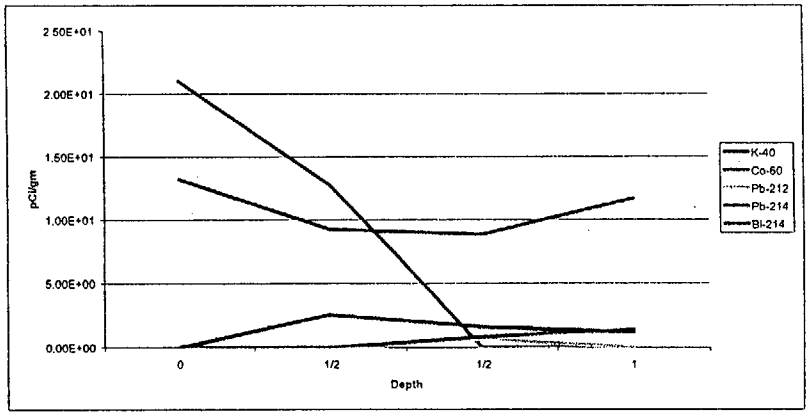
	C9000101I1FL1C1L0516-01 1ST PUCK 0-INCH DEPTH				C9000101I1FL1C1L0516-01A 1ST PUCK 1/2-INCH DEPTH				C9000101I1FL1C1L0516-02 2CND PUCK 1/2-INCH DEPTH				C9000101I1FL1C1L0516-02A 2CND PUCK 1-INCH DEPTH			
	Results	MDA	Used	%	Results	MDA	Used	%	Results	MDA	Used	%	Results	MDA	Used	%
K-40	1.32E+01	1.95E+00	1.32E+01	2.15%	9.26E+00	1.95E+00	9.26E+00	2.46%	8.84E+00	2.10E+00	8.84E+00	70.20%	1.17E+01	2.10E+00	1.17E+01	77.73%
Co-60	2.10E+01	1.98E-01	2.10E+01	3.41%	1.28E+01	1.98E-01	1.28E+01	3.39%	2.14E-01		0		2.14E-01		0	
Nb-94	ND				ND				ND				ND			
Ag-108m	ND				ND				ND				ND			
Cs-137	5.82E+02	1.39E+00	5.82E+02	94.45%	3.53E+02	8.79E-01	3.53E+02	93.47%	6.17E-01	2.54E-01	6.17E-01	4.89%	8.12E-01	2.27E-01	8.12E-01	5.39%
Eu-152	ND				ND				ND				ND			
Eu-154	ND				ND				ND				ND			
Tl-208	ND				ND				ND				ND			
Pb-212	ND		0		ND		0		6.82E-01	4.07E-01	6.82E-01	5.42%	5.55E-01		0	
Pb-214	ND		0		ND		0		8.59E-01	5.50E-01	8.59E-01	6.82%	1.37E+00	5.43E-01	1.37E+00	9.12%
Bi-212	ND				ND				ND				ND			
Bi-214	ND		0		2.57E+00	1.35E+00	2.57E+00	0.68%	1.60E+00	2.40E-01	1.60E+00	12.67%	1.17E+00	3.58E-01	1.17E+00	7.76%
Ra-226	ND				ND				ND				ND			
Ac-228	ND				ND				ND				ND			
Th-234	ND				ND				ND				ND			
U-235	ND				ND				ND				ND			
Am-241	ND				ND				ND				ND			
Cm-243	ND				ND				ND				ND			
Cm-245	ND				ND				ND				NO			
			6.16E+02	100.00%			3.77E+02	100.00%			1.26E+01	100.00%			1.50E+01	100.00%







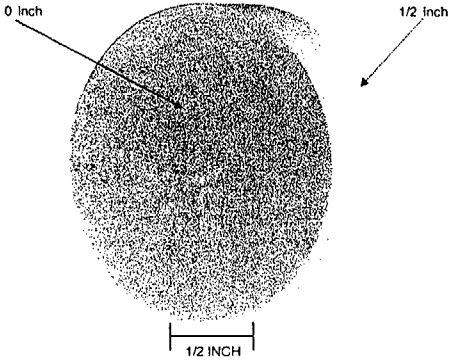
with Cs-137

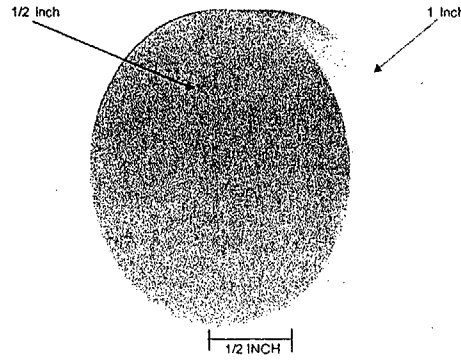


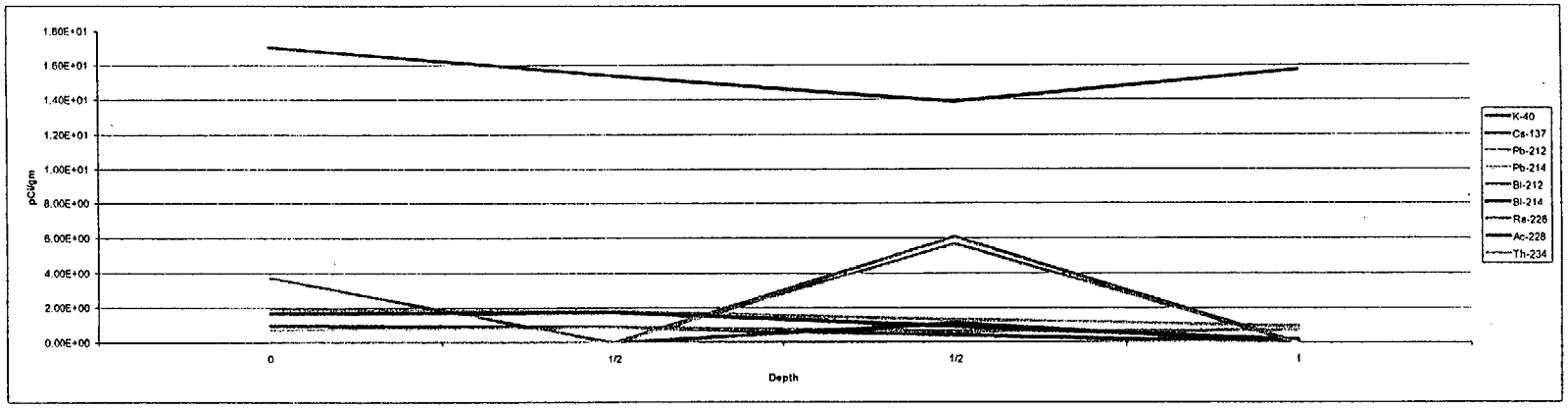
without Cs-137

CORE BORE #17, Fan House, -12 ft

	C9000101I1FL1C1L0517-01 1ST PUCK 0-INCH DEPTH				C9000101I1FL1C1L0517-01A 1ST PUCK 1/2-INCH DEPTH				C9000101I1FL1C1L0517-02 2CND PUCK 1/2-INCH DEPTH				C9000101I1FL1C1L0516-02A 2CND PUCK 1-INCH DEPTH			
	Results	MDA	Used	%	Results	MDA	Used	%	Results	MDA	Used	%	Results	MDA	Used	%
K-40	1.70E+01	2.46E+00	1.70E+01	65.69%	1.54E+01	2.46E+00	1.54E+01	74.32%	1.39E+01	2.27E+00	1.39E+01	46.03%	1.57E+01	2.27E+00	1.57E+01	89.44%
Co-60	ND				ND				ND				ND			
Nb-94	ND				ND				ND				ND			
Ag-108m	ND				ND				1.90E-01				ND			
Cs-137	9.95E-01	1.63E-01	9.95E-01	3.83%	8.85E-01	1.63E-01	8.85E-01	4.28%	4.48E-01	1.50E-01	4.48E-01	1.49%	3.68E-01		0	
Eu-152	ND				ND				ND				ND			
Eu-154	ND				ND				ND				ND			
Tl-208	ND				ND				ND				ND			
Pb-212	6.68E-01	5.55E-01	6.68E-01	2.58%	8.81E-01	4.85E-01	8.81E-01	4.26%	6.52E-01	5.11E-01	6.52E-01	2.17%	7.25E-01	5.56E-01	7.25E-01	4.13%
Pb-214	1.87E+00	7.01E-01	1.87E+00	7.21%	1.79E+00	6.30E-01	1.79E+00	8.65%	1.34E+00	5.27E-01	1.34E+00	4.46%	9.64E-01	4.77E-01	9.64E-01	5.49%
Bi-212	3.71E+00	2.28E+00	3.71E+00	14.29%	ND		0		ND		0		ND		0	
Bi-214	1.66E+00	6.27E-01	1.66E+00	6.40%	1.76E+00	2.81E-01	1.76E+00	8.49%	9.61E-01	4.09E-01	9.61E-01	3.19%	1.65E-01	2.59E-01	1.65E-01	0.94%
Ra-226	ND		0		ND		0		5.65E+00	5.38E+00	5.65E+00	18.77%	ND		0	
Ac-228	ND		0		ND		0		1.12E+00	6.45E-01	1.12E+00	3.70%	ND		0	
Th-234	ND		0		ND		0		6.08E+00	6.00E+00	6.08E+00	20.20%	ND		0	
U-235	ND				ND				ND				ND			
Am-241	ND				ND				ND				ND			
Cm-243	ND				ND				ND				ND			
Cm-245	ND				ND				ND				ND			
			2.60E+01	100.00%			2.07E+01	100.00%			3.01E+01	100.00%			1.76E+01	100.00%

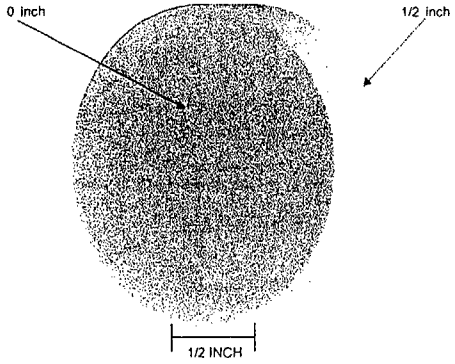


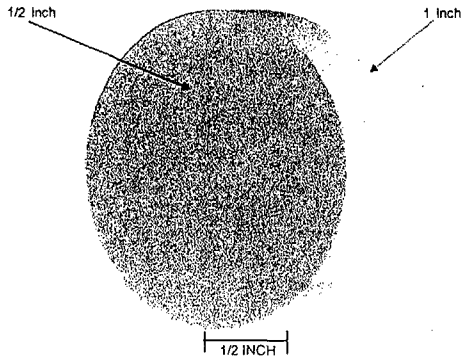


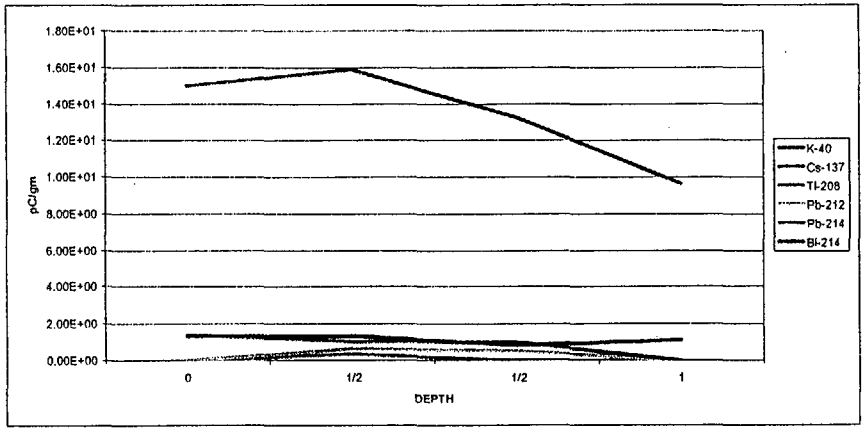


CORE BORE #21, ROLB Fuel Vault

	C9000101I1FL1C1L0521-01 1ST PUCK 0-INCH DEPTH				C9000101I1FL1C1L0521-01A 1ST PUCK 1/2-INCH DEPTH				C9000101I1FL1C1L0521-02 2CND PUCK 1/2-INCH DEPTH				C9000101I1FL1C1L0521-02A 2CND PUCK 1-INCH DEPTH			
	Results	MDA	Used	%	Results	MDA	Used	%	Results	MDA	Used	%	Results	MDA	Used	%
K-40	1.50E+01	2.21E+00	1.50E+01	84.76%	1.59E+01	2.21E+00	1.59E+01	81.31%	1.33E+01	2.08E+00	1.33E+01	84.59%	9.65E+00	2.98E+00	9.65E+00	87.04%
Co-60	ND				ND				ND				ND			
Nb-94	ND				ND				ND				ND			
Ag-108m	ND				ND				ND				ND			
Cs-137	ND		0		2.38E-01	1.46E-01	2.38E-01	1.22%	ND		0		3.05E-01	1.93E-01	3.05E-01	2.75%
Eu-152	ND				ND				ND				ND			
Eu-154	ND				ND				ND				ND			
Tl-208	ND		0		3.49E-01	2.66E-01	3.49E-01	1.78%	ND		0		ND		0	
Pb-212	ND		0		6.53E-01	5.68E-01	6.53E-01	3.34%	5.26E-01	4.71E-01	5.26E-01	3.35%	ND		0	
Pb-214	1.39E+00	6.69E-01	1.39E+00	7.85%	1.06E+00	4.75E-01	1.06E+00	5.43%	1.02E+00	5.06E-01	1.02E+00	6.51%	ND		0	
Bi-212	ND				ND				ND				ND			
Bi-214	1.31E+00	4.05E-01	1.31E+00	7.39%	1.35E+00	5.85E-01	1.35E+00	6.92%	8.70E-01	4.55E-01	8.70E-01	5.55%	1.13E+00	3.62E-01	1.13E+00	10.21%
Ra-226	ND				ND				ND				ND			
Ac-228	ND				ND				ND				ND			
Th-234	ND				ND				ND				ND			
U-235	ND				ND				ND				ND			
Am-241	ND				ND				ND				ND			
Cm-243	ND				ND				ND				ND			
Cm-245	ND				ND				ND				ND			
			1.77E+01	100.00%			1.95E+01	100.00%			1.57E+01	100.00%			1.11E+01	100.00%







Final Status Survey Plan
for the
Plum Brook Reactor Facility

Attachment A
Radionuclide Distribution Basis for DCGL Determination, and Final Status Survey of the Plum Brook Reactor Facility (PBRF)

Addendum 3
RESRAD and RESRAD-BUILD Models Used for Evaluation of Structural Radionuclide Distribution Using Smear Samples

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th BOPSMEARMIX Rev2.bld

RESRAD-BUILD Table of Contents

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th BOPSMEARMIX Rev2.bld

RESRAD-BUILD Input Parameters

Number of Sources : 6
Number of Receptors: 1
Total Time : 3.652500E+02 days
Fraction Inside : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	7.500	2.500	1.000	1.000	3.36E+01	0.00E+00

Receptor-Source Shielding Relationship

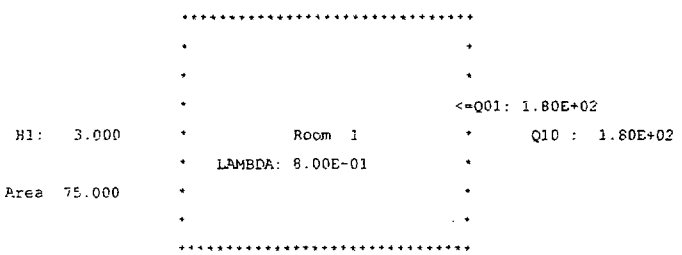
Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete
1	2	2.40E+00	0.00E+00	Concrete
1	3	2.40E+00	0.00E+00	Concrete
1	4	2.40E+00	0.00E+00	Concrete
1	5	2.40E+00	0.00E+00	Concrete
1	6	2.40E+00	0.00E+00	Concrete

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th BOPSMEARMIX Rev2.bld

======== Building Information ========

Building Air Exchange Rate: 8.00E-01 1/hr

Height[m] Air Exchanges [m3/hr]
Area [m2]



Deposition velocity: 2.70E-06 [m/s] Resuspension Rate: 1.40E-05 [1/s]

======== Source Information ========

Source: 1

Location:: Room : 1 x: 0.00 y: 2.50 z: 1.50[m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
EU-154	1.000E-10	9.550E-06	2.860E-04	7.180E-03

Source: 2

Location:: Room : 1 x: 15.00 y: 2.50 z: 1.50[m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
EU-154	1.000E-10	9.550E-06	2.860E-04	7.180E-03

Source: 3

Location:: Room : 1 x: 7.50 y: 0.00 z: 1.50[m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
EU-154	1.000E-10	9.550E-06	2.860E-04	7.180E-03

Source: 4

Location:: Room : 1 x: 7.50 y: 5.00 z: 1.50[m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
EU-154	1.000E-10	9.550E-06	2.860E-04	7.180E-03

Source: 5

Location:: Room : 1 x: 7.50 y: 2.50 z: 0.00[m]

Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 4.070E-07 [1/hr]

Fraction released to air: 7.000E-02

Removable fraction: 1.000E-01

Time to Remove: 5.270E+04 [day]

Radon Release Fraction: 0.000E+00

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
	[pCi/m2]	Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/ (pCi/m3)]
CM-243	3.000E-02	2.510E-03	3.070E-01	6.880E-04
PU-241	3.200E-01	6.850E-05	8.250E-03	2.560E-08
AM-241	1.300E-01	3.640E-03	4.440E-01	9.570E-05
PU-239	2.000E-02	3.540E-03	4.290E-01	4.960E-07
PU-238	4.000E-02	3.200E-03	3.920E-01	5.710E-07
NP-237	0.000E+00	4.440E-03	5.400E-01	1.210E-03
U-235	0.000E+00	2.670E-04	1.230E-01	9.030E-04
U-234	1.000E-02	2.830E-04	1.320E-01	8.930E-07
U-233	0.000E+00	2.890E-04	1.350E-01	1.910E-06
PA-231	0.000E+00	1.060E-02	1.280E+00	2.010E-04
TH-230	0.000E+00	5.480E-04	3.260E-01	2.040E-06
TH-229	0.000E+00	4.030E-03	2.160E+00	1.720E-03
AC-227	0.000E+00	1.480E-02	6.720E+00	2.160E-03
RA-226	0.000E+00	1.330E-03	8.600E-03	1.040E-02
PB-210	0.000E+00	5.370E-03	1.380E-02	1.050E-05
TC-99	1.200E-01	1.460E-06	8.330E-06	1.900E-07
SR-90	3.010E+00	1.530E-04	1.310E-03	2.310E-05
NI-63	1.370E+01	5.770E-07	6.290E-06	0.000E+00
NI-59	4.500E-01	2.100E-07	2.700E-06	0.000E+00
FE-55	1.980E+00	6.070E-07	2.690E-06	0.000E+00
C-14	5.800E-01	2.090E-06	2.090E-06	2.620E-08

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th BOPSMEARMIX Rev2.bld

Source: 6
Location:: Room : 1 x: 7.50 y: 2.50 z: 3.00[m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
EU-154	1.000E-10	9.550E-06	2.860E-04	7.180E-03

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th BOPSMEARMIX Rev2.bld
Evaluation Time: 0.0000000E+00 years

==========
==========
=== Assessment for Time: 1 ===
=== Time =0.00E+00 yr ===
==========
==========

======== Source Information ========

Source: 1
Location:: Room : 1 x: 0.00 y: 2.50 z: 1.50 [m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination:: Nuclide Concentration
[pCi/m2]
EU-154 1.000E-10

Source: 2
Location:: Room : 1 x: 15.00 y: 2.50 z: 1.50 [m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination:: Nuclide Concentration
[pCi/m2]
EU-154 1.000E-10

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th BOPSMEARMIX Rev2.bld
Evaluation Time: 0.00000000E+00 years

Source: 3
Location:: Room : 1 x: 7.50 y: 0.00 z: 1.50 [m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	EU-154	1.000E-10

Source: 4
Location:: Room : 1 x: 7.50 y: 5.00 z: 1.50 [m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	EU-154	1.000E-10

Source: 5
Location:: Room : 1 x: 7.50 y: 2.50 z: 0.00 [m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	CM-243	2.000E-02
	PU-241	3.200E-01

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th BOPSMEARM1X Rev2.bld
Evaluation Time: 0.00000000E+00 years

AM-241	1.300E-01
PU-239	2.000E-02
PU-238	4.000E-02
NP-237	0.000E+00
U-235	0.000E+00
U-234	1.000E-02
U-233	0.000E+00
PA-231	0.000E+00
TH-230	0.000E+00
TH-229	0.000E+00
AC-227	0.000E+00
RA-226	0.000E+00
PB-210	0.000E+00
TC-99	1.200E-01
SR-90	3.010E+00
NI-63	1.370E+01
NI-59	4.500E-01
FE-55	1.980E+00
C-14	5.800E-01

Source: 6
Location:: Room : 1 x: 7.50 y: 2.50 z: 3.00 [m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::	Nuclide	Concentration (pCi/m2)
	EU-154	1.000E-10

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th BOPSMEARMIX Rev2.bld
Evaluation Time: 0.00000000E+00 years

RESRAD-BUILDDose Tables

Source Contributions to Receptor Doses

[mrem]

	Source 1	Source 2	Source 3	Source 4	Source 5	Source 6	Total
Receptor 1	1.29E-16	1.29E-16	1.88E-15	1.88E-15	9.58E-06	3.09E-15	9.58E-06
Total	1.29E-16	1.29E-16	1.88E-15	1.88E-15	9.58E-06	3.09E-15	9.58E-06

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th BOPSMEARMIX Rev2.bld
Evaluation Time: 0.00000000E+00 years

Pathway Detail of Doses

(mrem)

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.28E-16	4.55E-25	8.52E-23	4.16E-20	0.00E+00	1.31E-18
Total	1.28E-16	4.55E-25	8.52E-23	4.16E-20	0.00E+00	1.31E-18

Source: 2

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.28E-16	4.55E-25	8.52E-23	4.16E-20	0.00E+00	1.31E-18
Total	1.28E-16	4.55E-25	8.52E-23	4.16E-20	0.00E+00	1.31E-18

Source: 3

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.88E-15	1.36E-24	2.56E-22	1.25E-19	0.00E+00	3.92E-18
Total	1.88E-15	1.36E-24	2.56E-22	1.25E-19	0.00E+00	3.92E-18

Source: 4

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.88E-15	1.36E-24	2.56E-22	1.25E-19	0.00E+00	3.92E-18
Total	1.88E-15	1.36E-24	2.56E-22	1.25E-19	0.00E+00	3.92E-18

Source: 5

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	2.35E-07	1.05E-16	5.85E-14	7.35E-07	3.93E-24	8.62E-06
Total	2.35E-07	1.05E-16	5.85E-14	7.35E-07	3.93E-24	8.62E-06

Source: 6

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	3.09E-15	3.27E-24	4.26E-22	2.08E-19	0.00E+00	6.54E-18
Total	3.09E-15	3.27E-24	4.26E-22	2.08E-19	0.00E+00	6.54E-18

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th BOPSMEARMIX Rev2.bld
Evaluation Time: 0.00000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor 1	Total
EU-154		
EU-154	1.29E-16	1.29E-16

Source: 2

Nuclide	Receptor 1	Total
EU-154		
EU-154	1.29E-16	1.29E-16

Source: 3

Nuclide	Receptor 1	Total
EU-154		
EU-154	1.88E-15	1.88E-15

Source: 4

Nuclide	Receptor 1	Total
EU-154		
EU-154	1.88E-15	1.88E-15

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th BOPSMEARMIX Rev2.bld
Evaluation Time: 0.00000000E+00 years

Source: 5

Nuclide	Receptor 1	Total
CM-243		
CM-243	4.23E-07	4.23E-07
PU-239	8.13E-12	8.13E-12
U-235	4.22E-22	4.22E-22
PA-231	4.25E-26	4.25E-26
AC-227	5.05E-28	5.05E-28
PU-241		
PU-241	1.72E-07	1.72E-07
AM-241	7.48E-09	7.48E-09
NP-237	1.04E-15	1.04E-15
U-233	9.26E-23	9.26E-23
TH-229	2.74E-26	2.74E-26
AM-241		
AM-241	3.85E-06	3.85E-06
NP-237	7.98E-13	7.98E-13
U-233	9.47E-20	9.47E-20
TH-229	3.49E-23	3.49E-23
PU-239		
PU-239	5.69E-07	5.69E-07
[illegible]35	4.42E-17	4.42E-17
[illegible]31	5.94E-21	5.94E-21
AC-227	8.77E-23	8.77E-23
PU-238		
PU-238	1.03E-06	1.03E-06
U-234	1.71E-13	1.71E-13
TH-230	1.08E-18	1.08E-18
RA-226	4.65E-22	4.65E-22
PB-210	4.37E-24	4.37E-24
U-234		
U-234	3.03E-08	3.03E-08
TH-230	2.87E-13	2.87E-13
RA-226	1.64E-16	1.64E-16
PB-210	1.92E-18	1.92E-18
TC-99		
TC-99	1.34E-09	1.34E-09
SR-90		
SR-90	3.43E-06	3.43E-06
NI-63		
NI-63	5.67E-08	5.67E-08
NI-59		
NI-59	6.82E-10	6.82E-10
FE-55		
FE-55	7.58E-09	7.58E-09
C-14		
C-14	8.76E-09	8.76E-09

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th BOPSMEARMIX Rev2.bld
Evaluation Time: 0.00000000E+00 years

Source: 6

Nuclide	Receptor 1	Total
EU-154		
EU-154	3.09E-15	3.09E-15

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th BOPSMEARMIX Rev2.bld
Summary

RESRAD-BUILD Dose (Time) Tables

Receptor Dose Received for the Exposure Duration

(mrem)

	Evaluation Time (yr)
	0.00E+00
1	9.58E-06

Receptor Dose/Yr Averaged Over Exposure Duration

(mrem/yr)

	Evaluation Time (yr)
	0.00E+00
1	9.58E-06

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th BOPSMEARMIX Rev2.bld

RESRAD-BUILD Table of Contents

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th BOPSMEARMIX Rev2.bld

RESRAD-BUILD Input Parameters

Number of Sources : 6
Number of Receptors: 1
Total Time : 3.652500E+02 days
Fraction Inside : 2.670000E-01

========== Receptor Information ==========

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	7.500	2.500	1.000	1.000	3.36E+01	0.00E+00

=== Receptor-Source Shielding Relationship ===

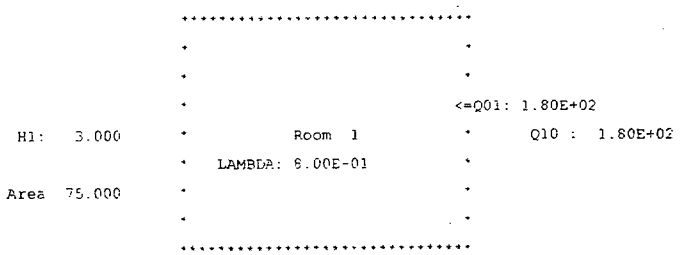
Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete
1	2	2.40E+00	0.00E+00	Concrete
1	3	2.40E+00	0.00E+00	Concrete
1	4	2.40E+00	0.00E+00	Concrete
1	5	2.40E+00	0.00E+00	Concrete
1	6	2.40E+00	0.00E+00	Concrete

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th BOPSMEARMIX Rev2.bld

======== Building Information ========

Building Air Exchange Rate: 8.00E-01 1/hr

Height[m] Air Exchanges [m3/hr]
Area [m2]



Deposition velocity: 2.70E-06 [m/s] Resuspension Rate: 1.40E-05 [1/s]

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th BOPSMEARMIX Rev2.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 0.00 y: 2.50 z: 1.50[m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
EU-154	1.000E-10	9.550E-06	2.860E-04	7.180E-03

Source: 2
Location:: Room : 1 x: 15.00 y: 2.50 z: 1.50[m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
EU-154	1.000E-10	9.550E-06	2.860E-04	7.180E-03

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th BOPSMEARMIX Rev2.bld

Source: 3
Location:: Room : 1 x: 7.50 y: 0.00 z: 1.50[m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
EU-154	1.000E-10	9.550E-06	2.860E-04	7.180E-03

Source: 4
Location:: Room : 1 x: 7.50 y: 5.00 z: 1.50[m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
EU-154	1.000E-10	9.550E-06	2.860E-04	7.180E-03

Source: 5

Location:: Room : 1 x: 7.50 y: 2.50 z: 0.00[m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::

Nuclide	Concentration [pCi/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity) Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/(pCi/m3)]
GD-152	0.000E+00	1.610E-04	2.430E-01	0.000E+00
EU-154	1.500E-01	9.550E-06	2.860E-04	7.180E-03
EU-152	1.300E-01	6.480E-06	2.210E-04	6.610E-03
CS-137	7.460E+00	5.000E-05	3.190E-05	3.190E-03
I-129	6.000E-02	2.760E-04	1.740E-04	4.450E-05
AG-108M	6.000E-02	7.620E-06	2.830E-04	9.140E-03
NB-94	3.000E-02	7.140E-06	4.140E-04	9.010E-03
CO-60	5.220E+00	2.690E-05	2.190E-04	1.470E-02

Source: 6

Location:: Room : 1 x: 7.50 y: 2.50 z: 3.00[m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::

Nuclide	Concentration [pCi/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity) Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/(pCi/m3)]
EU-154	1.000E-10	9.550E-06	2.860E-04	7.180E-05

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th BOPSMEARMIX Rev2.bld
Evaluation Time: 0.00000000E+00 years

==========
==========
=== Assessment for Time: 1 ===
=== Time =0.00E+00 yr ===
==========
==========

======== Source Information ========

Source: 1
Location:: Room : 1 x: 0.00 y: 2.50 z: 1.50 [m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	EU-154	1.000E-10

Source: 2
Location:: Room : 1 x: 15.00 y: 2.50 z: 1.50 [m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	EU-154	1.000E-10

Title : Flumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Flum Brook 75th BOPSMEARMIX Rev2.bld
Evaluation Time: 0.00000000E+00 years

Source: 3
Location:: Room : 1 x: 7.50 y: 0.00 z: 1.50 [m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	EU-154	1.000E-10

Source: 4
Location:: Room : 1 x: 7.50 y: 5.00 z: 1.50 [m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	EU-154	1.000E-10

Source: 5
Location:: Room : 1 x: 7.50 y: 2.50 z: 0.00 [m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	GD-152	0.000E+00
	EU-154	1.500E-01

EU-152	1.300E-01
CS-137	7.460E+00
I-129	6.000E-02
AG-108M	6.000E-02
NB-94	3.000E-02
CO-60	5.220E+00

Source: 6

Location:: Room : 1 x: 7.50 y: 2.50 z: 3.00 [m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	EU-154	1.000E-10

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th BOPSMEARMIX Rev2.bid
Calculation Time: 0.00000000E+00 years

RESRAD-BUILDDose Tables

Source Contributions to Receptor Doses

[mrem]

	Source 1	Source 2	Source 3	Source 4	Source 5	Source 6	Total
Receptor 1	1.29E-16	1.29E-16	1.88E-15	1.88E-15	1.61E-04	3.09E-15	1.61E-04
Total	1.29E-16	1.29E-16	1.88E-15	1.88E-15	1.61E-04	3.09E-15	1.61E-04

Title : Plumbrook Duplicate

Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th BOPSMEARMIX Rev2.bld

Calculation Time: 0.00000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.28E-16	4.55E-25	8.52E-23	4.16E-20	0.00E+00	1.31E-18
Total	1.28E-16	4.55E-25	8.52E-23	4.16E-20	0.00E+00	1.31E-18

Source: 2

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.28E-16	4.55E-25	8.52E-23	4.16E-20	0.00E+00	1.31E-18
Total	1.28E-16	4.55E-25	8.52E-23	4.16E-20	0.00E+00	1.31E-18

Source: 3

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.88E-15	1.36E-24	2.56E-22	1.25E-19	0.00E+00	3.92E-18
tal	1.88E-15	1.36E-24	2.56E-22	1.25E-19	0.00E+00	3.92E-18

Source: 4

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.88E-15	1.36E-24	2.56E-22	1.25E-19	0.00E+00	3.92E-18
Total	1.88E-15	1.36E-24	2.56E-22	1.25E-19	0.00E+00	3.92E-18

Source: 5

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.57E-04	7.00E-14	6.05E-11	1.07E-08	0.00E+00	3.70E-06
Total	1.57E-04	7.00E-14	6.05E-11	1.07E-08	0.00E+00	3.70E-06

Source: 6

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	3.09E-15	2.27E-24	4.26E-22	2.08E-19	0.00E+00	6.54E-18
Total	3.09E-15	2.27E-24	4.26E-22	2.08E-19	0.00E+00	6.54E-18

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th BOPSMEARMIX Rev2.bld
Evaluation Time: 0.00000000E+00 years

Nuclide Detail of Doses
=======================
(mrem)

Source: 1

Nuclide	Receptor 1	Total
EU-154		
EU-154	1.29E-16	1.29E-16

Source: 2

Nuclide	Receptor 1	Total
EU-154		
EU-154	1.29E-16	1.29E-16

Source: 3

Nuclide	Receptor 1	Total
EU-154		
EU-154	1.88E-15	1.88E-15

Source: 4

Nuclide	Receptor 1	Total
EU-154		
EU-154	1.88E-15	1.88E-15

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th BOPSMEARMIX Rev2.bid
Duration Time: 0.00000000E+00 years

Source: 5

Nuclide	Receptor 1	Total
EU-154		
EU-154	7.67E-06	7.67E-06
GD-152		
GD-152	1.22E-21	1.22E-21
EU-152	1.35E-06	1.35E-06
CS-137		
CS-137	4.15E-05	4.15E-05
I-129		
I-129	1.46E-07	1.46E-07
AG-108M		
AG-108M	9.16E-07	9.16E-07
NB-94		
NB-94	4.40E-07	4.40E-07
CO-60		
CO-60	1.09E-04	1.09E-04

Source: 6

Nuclide	Receptor 1	Total
EU-154		
EU-154	3.09E-15	3.09E-15

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th BOPSMEARMIX Rev2.bld
Summary

RESRAD-BUILD Dose (Time) Tables

Receptor Dose Received for the Exposure Duration

(mrem)

	Evaluation Time [yr] 0.00E+00
1	1.61E-04

Receptor Dose/Yr Averaged Over Exposure Duration

(mrem/yr)

	Evaluation Time [yr] 0.00E+00
1	1.61E-04

Title : Plumbrook Duplicate

Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 BOPSMEARMIX Rev2.bld

RESRAD-BUILD Table of Contents

Title : Plumbrook Duplicate

Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook R-3 BOPSMEARMIX Rev2.bld

RESRAD-BUILD Input Parameters

Number of Sources : 6
Number of Receptors: 1
Total Time : 3.652500E+02 days
Fraction Inside : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	7.500	2.500	1.000	1.000	3.36E+01	0.00E+00

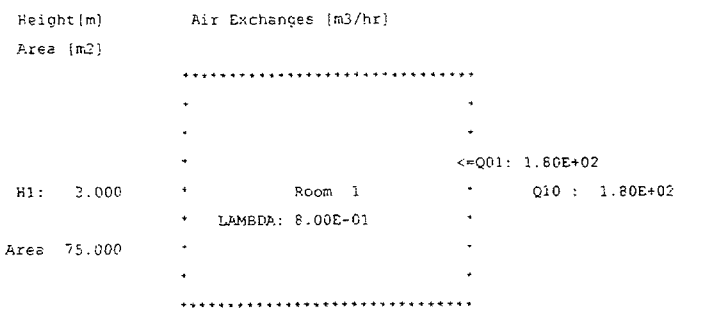
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete
1	2	2.40E+00	0.00E+00	Concrete
1	3	2.40E+00	0.00E+00	Concrete
1	4	2.40E+00	0.00E+00	Concrete
1	5	2.40E+00	0.00E+00	Concrete
1	6	2.40E+00	0.00E+00	Concrete

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 BOPSMEARMIX Rev2.bld

======== Building Information ========

Building Air Exchange Rate: 8.00E-01 1/hr



Deposition velocity: 2.70E-06 (m/s) Resuspension Rate: 1.40E-05 (1/s)

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_family\BUILD\Plum Brook H-3 BOPSMEARMIX Rev2.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 0.00 y: 2.50 z: 1.50[m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
H-3	1.000E-10	6.400E-06	6.400E-06	0.000E+00

ce: 2
Location:: Room : 1 x: 15.00 y: 2.50 z: 1.50[m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
H-3	1.000E-10	6.400E-06	6.400E-06	0.000E+00

Source: 3

Location:: Room : 1 x: 7.50 y: 0.00 z: 1.50[m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
H-3	1.000E-10	6.400E-08	6.400E-08	0.000E+00

Source: 4

Location:: Room : 1 x: 7.50 y: 5.00 z: 1.50[m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
H-3	1.000E-10	6.400E-08	6.400E-08	0.000E+00

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 BOPSMEARMIX Rev2.bld

Source: 5
Location:: Room : 1 x: 7.50 y: 2.50 z: 0.00[m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
H-3	6.650E+01	6.400E-08	6.400E-08	0.000E+00

Source: 6
Location:: Room : 1 x: 7.50 y: 2.50 z: 3.00[m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
H-3	1.000E-10	6.400E-08	6.400E-08	0.000E+00

Title : Plumbrook Duplicate

Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 BOPSMEARMIX Rev2.bld

Calculation Time: 0.00000000E+00 years

```
==========================================
==========================================
===       Assessment for Time:  1        ===
===            Time =0.00E+00 yr         ===
==========================================
==========================================
```

======== Source Information ========

Source: 1

Location:: Room : 1 x: 0.00 y: 2.50 z: 1.50 [m]

Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x

Pathway ::

Direct Ingestion Rate: 4.070E-07 [1/hr]

Fraction released to air: 1.000E+00

Removable fraction: 1.000E-01

Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	H-3	1.000E-10

Source: 2

Location:: Room : 1 x: 15.00 y: 2.50 z: 1.50 [m]

Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x

Pathway ::

Direct Ingestion Rate: 4.070E-07 [1/hr]

Fraction released to air: 1.000E+00

Removable fraction: 1.000E-01

Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	H-3	1.000E-10

Title : Plumbrook Duplicate

Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 BOPSMEARMIX Rev2.bld

Evaluation Time: 0.00000000E+00 years

Source: 3

Location:: Room : 1 x: 7.50 y: 0.00 z: 1.50 [m]

Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y

Pathway ::

Direct Ingestion Rate: 4.070E-07 [1/hr]

Fraction released to air: 1.000E+00

Removable fraction: 1.000E-01

Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	H-3	1.000E-10

Source: 4

Location:: Room : 1 x: 7.50 y: 5.00 z: 1.50 [m]

Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y

Pathway ::

Direct Ingestion Rate: 4.070E-07 [1/hr]

Fraction released to air: 1.000E+00

Removable fraction: 1.000E-01

Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	H-3	1.000E-10

Source: 5

Location:: Room : 1 x: 7.50 y: 2.50 z: 0.00 [m]

Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 4.070E-07 [1/hr]

Fraction released to air: 1.000E+00

Removable fraction: 1.000E-01

Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	H-3	6.650E+01

Title : Plumbrook Duplicate

Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 BOPSMEARMIX Rev2.bld

Duration Time: 0.00000000E+00 years

Source: 6

Location:: Room : 1 x: 7.50 y: 2.50 z: 3.00 [m]

Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 4.070E-07 [1/hr]

Fraction released to air: 1.000E+00

Removable fraction: 1.000E-01

Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	H-3	1.000E-10

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook R-3 BOPSMEARMIX Rev2.bld
Duration Time: 0.00000000E+00 years

RESRAD-BUILDDose Tables

Source Contributions to Receptor Doses

(mrem)

	Source 1	Source 2	Source 3	Source 4	Source 5	Source 6	Total
Receptor 1	9.39E-21	9.39E-21	2.82E-20	2.82E-20	3.12E-08	4.69E-20	3.12E-08
Total	9.39E-21	9.39E-21	2.82E-20	2.82E-20	3.12E-08	4.69E-20	3.12E-08

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 BOFSMEARMIX Rev2.bld
Evaluation Time: 0.00000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	5.84E-22	0.00E+00	8.80E-21
Total	0.00E+00	0.00E+00	0.00E+00	5.84E-22	0.00E+00	8.80E-21

Source: 2

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	5.84E-22	0.00E+00	8.80E-21
Total	0.00E+00	0.00E+00	0.00E+00	5.84E-22	0.00E+00	8.80E-21

Source: 3

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	1.75E-21	0.00E+00	2.64E-20
Total	0.00E+00	0.00E+00	0.00E+00	1.75E-21	0.00E+00	2.64E-20

Source: 4

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	1.75E-21	0.00E+00	2.64E-20
Total	0.00E+00	0.00E+00	0.00E+00	1.75E-21	0.00E+00	2.64E-20

Source: 5

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	1.94E-09	0.00E+00	2.93E-08
Total	0.00E+00	0.00E+00	0.00E+00	1.94E-09	0.00E+00	2.93E-08

Source: 6

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	2.92E-21	0.00E+00	4.40E-20
Total	0.00E+00	0.00E+00	0.00E+00	2.92E-21	0.00E+00	4.40E-20

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 BOPSMEARMIX Rev2.bld
Calculation Time: 0.00000000E+00 years

Nuclide Detail of Doses

(mrem)

Source: 1

Nuclide	Receptor 1	Total
H-3		
H-3	9.39E-21	9.39E-21

Source: 2

Nuclide	Receptor 1	Total
H-3		
H-3	9.39E-21	9.39E-21

Source: 3

Nuclide	Receptor 1	Total
H-3		
H-3	1.82E-20	1.82E-20

Source: 4

Nuclide	Receptor 1	Total
H-3		
H-3	1.82E-20	1.82E-20

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 BOPSMEARMIX Rev2.bld
Duration Time: 0.00000000E+00 years

Source: 5

Nuclide	Receptor 1	Total
H-3		
H-3	3.12E-08	3.12E-08

Source: 6

Nuclide	Receptor 1	Total
H-3		
H-3	4.69E-20	4.69E-20

Title : Plumbrook Duplicate
t File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 BOPSMEARMIX Rev2.bld
Summary

RESRAD-BUILD Dose (Time) Tables

Receptor Dose Received for the Exposure Duration

(mrem)

	Evaluation Time (yr) 0.00E+00
1	3.12E-08

Receptor Dose/Yr Averaged Over Exposure Duration

(mrem/yr)

	Evaluation Time (yr) 0.00E+00
1	3.12E-08

Summary : RESRAD Default Parameters
File : Plumbrook Subsurface Modified BOPSMEARMIXRev2.RAD

Table of Contents

Part I: Mixture Sums and Single Radionuclide Guidelines

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

Menu	Parameter	Current Value	Default	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	6.720E+00	6.720E+00	DCF2(1)
B-1	Ag-108m+D	2.830E-04	2.830E-04	DCF2(2)
B-1	Am-241	4.440E-01	4.440E-01	DCF2(3)
B-1	Am-243+D	4.400E-01	4.400E-01	DCF2(4)
B-1	C-14	2.090E-06	2.090E-06	DCF2(5)
B-1	Cm-243	3.070E-01	3.070E-01	DCF2(6)
B-1	Co-60	2.190E-04	2.190E-04	DCF2(8)
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2(9)
B-1	Eu-152	2.210E-04	2.210E-04	DCF2(10)
B-1	Eu-154	2.860E-04	2.860E-04	DCF2(12)
B-1	Eu-155	4.140E-05	4.140E-05	DCF2(13)
B-1	Fe-55	2.690E-06	2.690E-06	DCF2(14)
B-1	Gd-152	2.430E-01	2.430E-01	DCF2(15)
B-1	H-3	6.400E-08	6.400E-08	DCF2(16)
B-1	I-129	1.740E-04	1.740E-04	DCF2(17)
B-1	Na-22	7.660E-06	7.660E-06	DCF2(18)
B-1	Nb-94	4.140E-04	4.140E-04	DCF2(19)
B-1	Ni-59	2.700E-06	2.700E-06	DCF2(20)
	Ni-63	6.290E-06	6.290E-06	DCF2(21)
	Np-237+D	5.400E-01	5.400E-01	DCF2(22)
B-1	Pa-231	1.280E+00	1.280E+00	DCF2(23)
B-1	Pb-210+D	2.320E-02	2.320E-02	DCF2(24)
B-1	Pu-238	3.920E-01	3.920E-01	DCF2(25)
B-1	Pu-239	4.290E-01	4.290E-01	DCF2(26)
B-1	Pu-241+D	8.250E-03	8.250E-03	DCF2(27)
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF2(29)
B-1	Sb-125+D	1.386E-05	1.386E-05	DCF2(30)
B-1	Sr-90+D	1.310E-03	1.310E-03	DCF2(31)
B-1	Tc-99	8.330E-06	8.330E-06	DCF2(32)
B-1	Th-229+D	2.160E+00	2.160E+00	DCF2(33)
B-1	Th-230	3.260E-01	3.260E-01	DCF2(34)
B-1	U-233	1.350E-01	1.350E-01	DCF2(35)
B-1	U-234	1.320E-01	1.320E-01	DCF2(36)
B-1	U-235+D	1.230E-01	1.230E-01	DCF2(37)
B-1	U-238+D	1.180E-01	1.180E-01	DCF2(38)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	1.480E-02	1.480E-02	DCF3(1)
D-1	Ag-108m+D	7.620E-06	7.620E-06	DCF3(2)
D-1	Am-241	3.640E-03	3.640E-03	DCF3(3)
D-1	Am-243+D	3.630E-03	3.630E-03	DCF3(4)
D-1	C-14	2.090E-06	2.090E-06	DCF3(5)
D-1	Cm-243	2.510E-03	2.510E-03	DCF3(6)
D-1	Co-60	2.690E-05	2.690E-05	DCF3(8)
	Cs-137+D	5.000E-05	5.000E-05	DCF3(9)
D-1	Eu-152	6.480E-06	6.480E-06	DCF3(10)
D-1	Eu-154	9.550E-06	9.550E-06	DCF3(12)
D-1	Eu-155	1.530E-06	1.530E-06	DCF3(13)
D-1	Fe-55	6.070E-07	6.070E-07	DCF3(14)

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

Menu	Parameter	Current Value	Default	Parameter Name
D-1	Gd-152	1.610E-04	1.610E-04	DCF3(15)
D-1	H-3	6.400E-08	6.400E-08	DCF3(16)
D-1	I-129	2.760E-04	2.760E-04	DCF3(17)
D-1	Na-22	1.150E-05	1.150E-05	DCF3(18)
D-1	Nb-94	7.140E-06	7.140E-06	DCF3(19)
D-1	Ni-59	2.100E-07	2.100E-07	DCF3(20)
D-1	Ni-63	5.770E-07	5.770E-07	DCF3(21)
D-1	Np-237+D	4.440E-03	4.440E-03	DCF3(22)
D-1	Pa-231	1.060E-02	1.060E-02	DCF3(23)
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF3(24)
D-1	Pu-238	3.200E-03	3.200E-03	DCF3(25)
D-1	Pu-239	3.540E-03	3.540E-03	DCF3(26)
D-1	Pu-241+D	6.850E-05	6.850E-05	DCF3(27)
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF3(29)
D-1	Sb-125+D	3.647E-06	3.647E-06	DCF3(30)
D-1	Sr-90+D	1.530E-04	1.530E-04	DCF3(31)
D-1	Tc-99	1.460E-06	1.460E-06	DCF3(32)
D-1	Th-229+D	4.030E-03	4.030E-03	DCF3(33)
D-1	Th-230	5.480E-04	5.480E-04	DCF3(34)
D-1	U-233	2.890E-04	2.890E-04	DCF3(35)
D-1	U-234	2.830E-04	2.830E-04	DCF3(36)
D-1	U-235+D	2.670E-04	2.670E-04	DCF3(37)
D-1	U-238+D	2.690E-04	2.690E-04	DCF3(38)
D-34	Food transfer factors:			
D-34	Ac-227+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(1,1)
D-34	Ac-227+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,2)
D-34	Ac-227+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,3)
D-34				
D-34	Ag-108m+D, plant/soil concentration ratio, dimensionless	1.500E-01	1.500E-01	RTF(2,1)
D-34	Ag-108m+D, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-03	3.000E-03	RTF(2,2)
D-34	Ag-108m+D, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.500E-02	2.500E-02	RTF(2,3)
D-34				
D-34	Am-241 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(3,1)
D-34	Am-241 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-05	5.000E-05	RTF(3,2)
D-34	Am-241 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(3,3)
D-34				
D-34	Am-243+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(4,1)
D-34	Am-243+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-05	5.000E-05	RTF(4,2)
D-34	Am-243+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(4,3)
D-34				
D-34	C-14 , plant/soil concentration ratio, dimensionless	5.500E+00	5.500E+00	RTF(5,1)
D-34	C-14 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.100E-02	3.100E-02	RTF(5,2)
D-34	C-14 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.200E-02	1.200E-02	RTF(5,3)
D-34				
D-34	Cm-243 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(6,1)
D-34	Cm-243 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(6,2)
D-34	Cm-243 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(6,3)
D-34				

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

Menu	Parameter	Current Value	Default	Parameter Name
D-34	Co-60 , plant/soil concentration ratio, dimensionless	8.000E-02	8.000E-02	RTF(8,1)
D-34	Co-60 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-02	2.000E-02	RTF(8,2)
D-34	Co-60 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(8,3)
D-34				
D-34	Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(9,1)
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(9,2)
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(9,3)
D-34				
D-34	Eu-152 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(10,1)
D-34	Eu-152 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(10,2)
D-34	Eu-152 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(10,3)
D-34				
D-34	Eu-154 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(12,1)
D-34	Eu-154 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(12,2)
D-34	Eu-154 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(12,3)
D-34				
D-34	Eu-155 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(13,1)
D-34	Eu-155 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(13,2)
D-34	Eu-155 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(13,3)
	Fe-55 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(14,1)
D-34	Fe-55 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-02	2.000E-02	RTF(14,2)
D-34	Fe-55 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(14,3)
D-34				
D-34	Gd-152 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(15,1)
D-34	Gd-152 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(15,2)
D-34	Gd-152 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(15,3)
D-34				
D-34	H-3 , plant/soil concentration ratio, dimensionless	4.800E+00	4.800E+00	RTF(16,1)
D-34	H-3 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.200E-02	1.200E-02	RTF(16,2)
D-34	H-3 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-02	1.000E-02	RTF(16,3)
D-34				
D-34	I-129 , plant/soil concentration ratio, dimensionless	2.000E-02	2.000E-02	RTF(17,1)
D-34	I-129 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	7.000E-03	7.000E-03	RTF(17,2)
D-34	I-129 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-02	1.000E-02	RTF(17,3)
D-34				
D-34	Na-22 , plant/soil concentration ratio, dimensionless	5.000E-02	5.000E-02	RTF(18,1)
D-34	Na-22 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-02	8.000E-02	RTF(18,2)
D-34	Na-22 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	4.000E-02	4.000E-02	RTF(18,3)
D-34				
D-34	Nb-94 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(19,1)
D-34	Nb-94 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-07	3.000E-07	RTF(19,2)
D-34	Nb-94 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(19,3)
D-34				
	Ni-59 , plant/soil concentration ratio, dimensionless	5.000E-02	5.000E-02	RTF(20,1)
	Ni-59 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(20,2)
D-34	Ni-59 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-02	2.000E-02	RTF(20,3)
D-34				

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

Menu	Parameter	Current Value	Default	Parameter Name
D-34	Ni-63 , plant/soil concentration ratio, dimensionless	5.000E-02	5.000E-02	RTF(21,1)
D-34	Ni-63 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(21,2)
D-34	Ni-63 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-02	2.000E-02	RTF(21,3)
D-34				
D-34	Np-237+D , plant/soil concentration ratio, dimensionless	2.000E-02	2.000E-02	RTF(22,1)
D-34	Np-237+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(22,2)
D-34	Np-237+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(22,3)
D-34				
D-34	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(23,1)
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(23,2)
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(23,3)
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(24,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(24,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(24,3)
D-34				
D-34	Pu-238 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(25,1)
D-34	Pu-238 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(25,2)
D-34	Pu-238 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(25,3)
	Pu-239 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(26,1)
D-34	Pu-239 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(26,2)
D-34	Pu-239 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(26,3)
D-34				
D-34	Pu-241+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(27,1)
D-34	Pu-241+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(27,2)
D-34	Pu-241+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(27,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(28,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(28,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(28,3)
D-34				
D-34	Sb-125+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(30,1)
D-34	Sb-125+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(30,2)
D-34	Sb-125+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-04	1.000E-04	RTF(30,3)
D-34				
D-34	Sr-90+D , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF(31,1)
D-34	Sr-90+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-03	8.000E-03	RTF(31,2)
D-34	Sr-90+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(31,3)
D-34				
D-34	Tc-99 , plant/soil concentration ratio, dimensionless	5.000E+00	5.000E+00	RTF(32,1)
D-34	Tc-99 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(32,2)
D-34	Tc-99 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(32,3)
D-34				
4	Th-229+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(33,1)
	Th-229+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(33,2)
D-34	Th-229+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(33,3)
D-34				

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

Menu	Parameter	Current Value	Default	Parameter Name
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(34,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(34,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(34,3)
D-34				
D-34	U-233 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(35,1)
D-34	U-233 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(35,2)
D-34	U-233 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(35,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(36,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(36,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(36,3)
D-34				
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(37,1)
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(37,2)
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(37,3)
D-34				
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(38,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(38,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(38,3)
[illegible]				
[illegible]	Bioaccumulation factors, fresh water, L/kg:			
D-5	Ac-227+D , fish	1.500E+01	1.500E+01	BIOFAC(1,1)
D-5	Ac-227+D , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(1,2)
D-5				
D-5	Ag-108m+D, fish	5.000E+00	5.000E+00	BIOFAC(2,1)
D-5	Ag-108m+D, crustacea and mollusks	7.700E+02	7.700E+02	BIOFAC(2,2)
D-5				
D-5	Am-241 , fish	3.000E+01	3.000E+01	BIOFAC(3,1)
D-5	Am-241 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(3,2)
D-5				
D-5	Am-243+D , fish	3.000E+01	3.000E+01	BIOFAC(4,1)
D-5	Am-243+D , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(4,2)
D-5				
D-5	C-14 , fish	5.000E+04	5.000E+04	BIOFAC(5,1)
D-5	C-14 , crustacea and mollusks	9.100E+03	9.100E+03	BIOFAC(5,2)
D-5				
D-5	Cm-243 , fish	3.000E+01	3.000E+01	BIOFAC(6,1)
D-5	Cm-243 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(6,2)
D-5				
D-5	Co-60 , fish	3.000E+02	3.000E+02	BIOFAC(8,1)
D-5	Co-60 , crustacea and mollusks	2.000E+02	2.000E+02	BIOFAC(8,2)
D-5				
D-5	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC(9,1)
D-5	Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(9,2)
[illegible]				
[illegible]	Eu-152 , fish	5.000E+01	5.000E+01	BIOFAC(10,1)
D-5	Eu-152 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(10,2)
D-5				
D-5	Eu-154 , fish	5.000E+01	5.000E+01	BIOFAC(12,1)
D-5	Eu-154 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(12,2)

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

Menu	Parameter	Current Value	Default	Parameter Name
D-5	Eu-155 , fish	5.000E+01	5.000E+01	BIOFAC(13,1)
D-5	Eu-155 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(13,2)
D-5				
D-5	Fe-55 , fish	2.000E+02	2.000E+02	BIOFAC(14,1)
D-5	Fe-55 , crustacea and mollusks	3.200E+03	3.200E+03	BIOFAC(14,2)
D-5				
D-5	Gd-152 , fish	2.500E+01	2.500E+01	BIOFAC(15,1)
D-5	Gd-152 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(15,2)
D-5				
D-5	H-3 , fish	1.000E+00	1.000E+00	BIOFAC(16,1)
D-5	H-3 , crustacea and mollusks	1.000E+00	1.000E+00	BIOFAC(16,2)
D-5				
D-5	I-129 , fish	4.000E+01	4.000E+01	BIOFAC(17,1)
D-5	I-129 , crustacea and mollusks	5.000E+00	5.000E+00	BIOFAC(17,2)
D-5				
D-5	Na-22 , fish	2.000E+01	2.000E+01	BIOFAC(18,1)
D-5	Na-22 , crustacea and mollusks	2.000E+02	2.000E+02	BIOFAC(18,2)
D-5				
D-5	Nb-94 , fish	3.000E+02	3.000E+02	BIOFAC(19,1)
	Nb-94 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(19,2)
D-5				
D-5	Ni-59 , fish	1.000E+02	1.000E+02	BIOFAC(20,1)
D-5	Ni-59 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(20,2)
D-5				
D-5	Ni-63 , fish	1.000E+02	1.000E+02	BIOFAC(21,1)
D-5	Ni-63 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(21,2)
D-5				
D-5	Np-237+D , fish	3.000E+01	3.000E+01	BIOFAC(22,1)
D-5	Np-237+D , crustacea and mollusks	4.000E+02	4.000E+02	BIOFAC(22,2)
D-5				
D-5	Pa-231 , fish	1.000E+01	1.000E+01	BIOFAC(23,1)
D-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(23,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(24,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(24,2)
D-5				
D-5	Pu-238 , fish	3.000E+01	3.000E+01	BIOFAC(25,1)
D-5	Pu-238 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(25,2)
D-5				
D-5	Pu-239 , fish	3.000E+01	3.000E+01	BIOFAC(26,1)
D-5	Pu-239 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(26,2)
D-5				
D-5	Pu-241+D , fish	3.000E+01	3.000E+01	BIOFAC(27,1)
D-5	Pu-241+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(27,2)
	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(29,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(29,2)
D-5				
D-5	Sb-125+D , fish	1.000E+02	1.000E+02	BIOFAC(30,1)
D-5	Sb-125+D , crustacea and mollusks	1.000E+01	1.000E+01	BIOFAC(30,2)

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

Menu	Parameter	Current Value	Default	Parameter Name
D-5	Sr-90+D , fish	6.000E+01	6.000E+01	BIOFAC(31,1)
D-5	Sr-90+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(31,2)
D-5				
D-5	Tc-99 , fish	2.000E+01	2.000E+01	BIOFAC(32,1)
D-5	Tc-99 , crustacea and mollusks	5.000E+00	5.000E+00	BIOFAC(32,2)
D-5				
D-5	Th-229+D , fish	1.000E+02	1.000E+02	BIOFAC(33,1)
D-5	Th-229+D , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(33,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(34,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(34,2)
D-5				
D-5	U-233 , fish	1.000E+01	1.000E+01	BIOFAC(35,1)
D-5	U-233 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(35,2)
D-5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(36,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(36,2)
D-5				
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIOFAC(37,1)
	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(37,2)
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(38,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(38,2)

Summary : RESRAD Default Parameters
File : Plumbrook Subsurface Modified BOPSMEARMIXRev2.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)	3.850E+03	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	3.000E+00	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	7.000E+01	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	2.500E+01	---	BRDL
R011	Time since placement of material (yr)	1.000E+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): Ag-108m	6.000E-02	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Am-241	1.300E-01	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): C-14	5.800E-01	0.000E+00	---	S1(5)
R012	Initial principal radionuclide (pCi/g): Cm-243	2.000E-02	0.000E+00	---	S1(6)
R012	Initial principal radionuclide (pCi/g): Co-60	5.220E+00	0.000E+00	---	S1(8)
R012	Initial principal radionuclide (pCi/g): Cs-137	7.460E+00	0.000E+00	---	S1(9)
R012	Initial principal radionuclide (pCi/g): Eu-152	1.300E-01	0.000E+00	---	S1(10)
R012	Initial principal radionuclide (pCi/g): Eu-154	1.500E-01	0.000E+00	---	S1(12)
R012	Initial principal radionuclide (pCi/g): Fe-55	1.980E+00	0.000E+00	---	S1(14)
R012	Initial principal radionuclide (pCi/g): H-3	6.653E+01	0.000E+00	---	S1(16)
R012	Initial principal radionuclide (pCi/g): I-129	6.000E-02	0.000E+00	---	S1(17)
R012	Initial principal radionuclide (pCi/g): Nb-94	3.000E-02	0.000E+00	---	S1(19)
R012	Initial principal radionuclide (pCi/g): Ni-59	4.500E-01	0.000E+00	---	S1(20)
R012	Initial principal radionuclide (pCi/g): Ni-63	1.366E+01	0.000E+00	---	S1(21)
R012	Initial principal radionuclide (pCi/g): Pu-238	4.000E-02	0.000E+00	---	S1(25)
R012	Initial principal radionuclide (pCi/g): Pu-239	2.000E-02	0.000E+00	---	S1(26)
R012	Initial principal radionuclide (pCi/g): Pu-241	3.200E-01	0.000E+00	---	S1(27)
R012	Initial principal radionuclide (pCi/g): Sr-90	3.010E+00	0.000E+00	---	S1(31)
R012	Initial principal radionuclide (pCi/g): Tc-99	1.200E-01	0.000E+00	---	S1(32)
R012	Initial principal radionuclide (pCi/g): U-234	1.000E-02	0.000E+00	---	S1(36)
R012	Concentration in groundwater (pCi/L): Ag-108m	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Am-241	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): C-14	not used	0.000E+00	---	W1(5)
R012	Concentration in groundwater (pCi/L): Cm-243	not used	0.000E+00	---	W1(6)
R012	Concentration in groundwater (pCi/L): Co-60	not used	0.000E+00	---	W1(8)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	W1(9)
R012	Concentration in groundwater (pCi/L): Eu-152	not used	0.000E+00	---	W1(10)
R012	Concentration in groundwater (pCi/L): Eu-154	not used	0.000E+00	---	W1(12)
R012	Concentration in groundwater (pCi/L): Fe-55	not used	0.000E+00	---	W1(14)
R012	Concentration in groundwater (pCi/L): H-3	not used	0.000E+00	---	W1(16)
R012	Concentration in groundwater (pCi/L): I-129	not used	0.000E+00	---	W1(17)
R012	Concentration in groundwater (pCi/L): Nb-94	not used	0.000E+00	---	W1(19)
R012	Concentration in groundwater (pCi/L): Ni-59	not used	0.000E+00	---	W1(20)
R012	Concentration in groundwater (pCi/L): Ni-63	not used	0.000E+00	---	W1(21)
R012	Concentration in groundwater (pCi/L): Pu-238	not used	0.000E+00	---	W1(25)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R012	Concentration in groundwater (pCi/L): Pu-239	not used	0.000E+00	---	W1(26)
R012	Concentration in groundwater (pCi/L): Pu-241	not used	0.000E+00	---	W1(27)
R012	Concentration in groundwater (pCi/L): Sr-90	not used	0.000E+00	---	W1(31)
R012	Concentration in groundwater (pCi/L): Tc-99	not used	0.000E+00	---	W1(32)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(36)
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)	1.560E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.100E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	8.600E-01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	1.400E+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)	8.000E+00	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	8.600E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	1.040E+00	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)	1.000E+06	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	1.460E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	4.500E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	2.000E-01	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	2.000E-01	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	1.070E+03	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	4.500E-03	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	0.000E+00	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	2.010E+00	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	MB	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	1.180E+02	2.500E+02	---	UW
R015	Number of unsaturated zone strata	1	1	---	NS
R015	Unsat. zone 1, thickness (m)	0.000E+00	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.560E+00	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	4.100E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	3.000E-01	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	2.000E-01	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	1.400E+00	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	1.262E+03	1.000E+01	---	HCUZ(1)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Ag-108m				
R016	Contaminated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.024E-01	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Am-241				
R016	Contaminated zone (cm**3/g)	4.450E+02	2.000E+01	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.146E-04	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for C-14				
R016	Contaminated zone (cm**3/g)	2.600E+01	0.000E+00	---	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	2.100E+01	0.000E+00	---	DCNUCU(5,1)
R016	Saturated zone (cm**3/g)	2.100E+01	0.000E+00	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.030E-03	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
	Distribution coefficients for Cm-243				
R016	Contaminated zone (cm**3/g)	4.000E+02	-1.000E+00	---	DCNUCC(6)
R016	Unsaturated zone 1 (cm**3/g)	6.760E+03	-1.000E+00	---	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	6.760E+03	-1.000E+00	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.612E-04	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R016	Distribution coefficients for Co-60				
R016	Contaminated zone (cm**3/g)	1.700E+01	1.000E+03	---	DCNUCC(8)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCU(8,1)
R016	Saturated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.069E-02	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	6.500E+00	1.000E+03	---	DCNUCC(9)
R016	Unsaturated zone 1 (cm**3/g)	4.470E+02	1.000E+03	---	DCNUCU(9,1)
R016	Saturated zone (cm**3/g)	4.470E+02	1.000E+03	---	DCNUCS(9)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.730E-02	ALEACH(9)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(9)
R016	Distribution coefficients for Eu-152				
R016	Contaminated zone (cm**3/g)	4.000E+02	-1.000E+00	---	DCNUCC(10)
R016	Unsaturated zone 1 (cm**3/g)	9.550E+02	-1.000E+00	---	DCNUCU(10,1)
R016	Saturated zone (cm**3/g)	9.550E+02	-1.000E+00	---	DCNUCS(10)
	Leach rate (/yr)	0.000E+00	0.000E+00	4.612E-04	ALEACH(10)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(10)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Eu-154				
R016	Contaminated zone (cm**3/g)	4.000E+02	-1.000E+00	---	DCNUCC(12)
R016	Unsaturated zone 1 (cm**3/g)	9.550E+02	-1.000E+00	---	DCNUCU(12,1)
R016	Saturated zone (cm**3/g)	9.550E+02	-1.000E+00	---	DCNUCS(12)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.612E-04	ALEACH(12)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(12)
R016	Distribution coefficients for Fe-55				
R016	Contaminated zone (cm**3/g)	1.300E+01	1.000E+03	---	DCNUCC(14)
R016	Unsaturated zone 1 (cm**3/g)	8.910E+02	1.000E+03	---	DCNUCU(14,1)
R016	Saturated zone (cm**3/g)	8.910E+02	1.000E+03	---	DCNUCS(14)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.392E-02	ALEACH(14)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(14)
R016	Distribution coefficients for H-3				
R016	Contaminated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCC(16)
R016	Unsaturated zone 1 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU(16,1)
R016	Saturated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCS(16)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.024E-01	ALEACH(16)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(16)
	Distribution coefficients for I-129				
R016	Contaminated zone (cm**3/g)	3.200E+00	1.000E-01	---	DCNUCC(17)
R016	Unsaturated zone 1 (cm**3/g)	1.000E-01	1.000E-01	---	DCNUCU(17,1)
R016	Saturated zone (cm**3/g)	1.000E-01	1.000E-01	---	DCNUCS(17)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.331E-02	ALEACH(17)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(17)
R016	Distribution coefficients for Nb-94				
R016	Contaminated zone (cm**3/g)	3.250E+02	0.000E+00	---	DCNUCC(19)
R016	Unsaturated zone 1 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU(19,1)
R016	Saturated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCS(19)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.676E-04	ALEACH(19)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(19)
R016	Distribution coefficients for Ni-59				
R016	Contaminated zone (cm**3/g)	3.200E+01	1.000E+03	---	DCNUCC(20)
R016	Unsaturated zone 1 (cm**3/g)	3.700E+01	1.000E+03	---	DCNUCU(20,1)
R016	Saturated zone (cm**3/g)	3.700E+01	1.000E+03	---	DCNUCS(20)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.722E-03	ALEACH(20)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(20)
R016	Distribution coefficients for Ni-63				
R016	Contaminated zone (cm**3/g)	3.200E+01	1.000E+03	---	DCNUCC(21)
R016	Unsaturated zone 1 (cm**3/g)	3.700E+01	1.000E+03	---	DCNUCU(21,1)
R016	Saturated zone (cm**3/g)	3.700E+01	1.000E+03	---	DCNUCS(21)
	Leach rate (/yr)	0.000E+00	0.000E+00	5.722E-03	ALEACH(21)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(21)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Pu-238				
R016	Contaminated zone (cm**3/g)	1.625E+03	2.000E+03	---	DCNUCC(25)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCU(25,1)
R016	Saturated zone (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCS(25)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.136E-04	ALEACH(25)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(25)
R016	Distribution coefficients for Pu-239				
R016	Contaminated zone (cm**3/g)	1.625E+03	2.000E+03	---	DCNUCC(26)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCU(26,1)
R016	Saturated zone (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCS(26)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.136E-04	ALEACH(26)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(26)
R016	Distribution coefficients for Pu-241				
R016	Contaminated zone (cm**3/g)	1.625E+03	2.000E+03	---	DCNUCC(27)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCU(27,1)
R016	Saturated zone (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCS(27)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.136E-04	ALEACH(27)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(27)
	Distribution coefficients for Sr-90				
R016	Contaminated zone (cm**3/g)	3.500E+00	3.000E+01	---	DCNUCC(31)
R016	Unsaturated zone 1 (cm**3/g)	3.200E+01	3.000E+01	---	DCNUCU(31,1)
R016	Saturated zone (cm**3/g)	3.200E+01	3.000E+01	---	DCNUCS(31)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.906E-02	ALEACH(31)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(31)
R016	Distribution coefficients for Tc-99				
R016	Contaminated zone (cm**3/g)	5.200E+00	0.000E+00	---	DCNUCC(32)
R016	Unsaturated zone 1 (cm**3/g)	7.000E+00	0.000E+00	---	DCNUCU(32,1)
R016	Saturated zone (cm**3/g)	7.000E+00	0.000E+00	---	DCNUCS(32)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.379E-02	ALEACH(32)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(32)
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	2.120E+02	5.000E+01	---	DCNUCC(36)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(36,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(36)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.697E-04	ALEACH(36)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(36)
R016	Distribution coefficients for daughter Ac-227				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCS(1)
	Leach rate (/yr)	0.000E+00	0.000E+00	9.111E-03	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for daughter Am-243				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(4)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.111E-03	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)
R016	Distribution coefficients for daughter Eu-155				
R016	Contaminated zone (cm**3/g)	4.000E+02	-1.000E+00	---	DCNUCC(13)
R016	Unsaturated zone 1 (cm**3/g)	9.550E+02	-1.000E+00	---	DCNUCU(13,1)
R016	Saturated zone (cm**3/g)	9.550E+02	-1.000E+00	---	DCNUCS(13)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.612E-04	ALEACH(13)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(13)
R016	Distribution coefficients for daughter Gd-152				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCC(15)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU(15,1)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCS(15)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.237E-04	ALEACH(15)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(15)
	Distribution coefficients for daughter Na-22				
R016	Contaminated zone (cm**3/g)	1.000E+01	1.000E+01	---	DCNUCC(18)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+01	1.000E+01	---	DCNUCU(18,1)
R016	Saturated zone (cm**3/g)	1.000E+01	1.000E+01	---	DCNUCS(18)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.799E-02	ALEACH(18)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(18)
R016	Distribution coefficients for daughter Np-237				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCC(22)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCU(22,1)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCS(22)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.164E-04	ALEACH(22)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(22)
R016	Distribution coefficients for daughter Pa-231				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(23)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(23,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(23)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.673E-03	ALEACH(23)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(23)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC(24)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCU(24,1)
R016	Saturated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCS(24)
	Leach rate (/yr)	0.000E+00	0.000E+00	1.841E-03	ALEACH(24)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(24)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for daughter Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(29)
R016	Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU(29,1)
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCS(29)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.627E-03	ALEACH(29)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(29)
R016	Distribution coefficients for daughter Sb-125				
R016	Contaminated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCC(30)
R016	Unsaturated zone 1 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU(30,1)
R016	Saturated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCS(30)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.024E-01	ALEACH(30)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(30)
R016	Distribution coefficients for daughter Th-229				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(33)
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCU(33,1)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(33)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.077E-06	ALEACH(33)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(33)
R016	Distribution coefficients for daughter Th-230				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(34)
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCU(34,1)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(34)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.077E-06	ALEACH(34)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(34)
R016	Distribution coefficients for daughter U-233				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(35)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(35,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(35)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.673E-03	ALEACH(35)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(35)
R016	Distribution coefficients for daughter U-235				
R016	Contaminated zone (cm**3/g)	2.120E+02	5.000E+01	---	DCNUCC(37)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(37,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(37)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.697E-04	ALEACH(37)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(37)
R016	Distribution coefficients for daughter U-238				
R016	Contaminated zone (cm**3/g)	2.120E+02	5.000E+01	---	DCNUCC(38)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(38,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(38)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.697E-04	ALEACH(38)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(38)
R017	Inhalation rate (m**3/yr)	8.400E+03	8.400E+03	---	INHALR

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Mass loading for inhalation (g/m**3)	6.000E-06	1.000E-04	---	MLINH
R017	Exposure duration	3.653E+02	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	4.700E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	6.600E-01	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	1.100E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS
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)
	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)	7.800E+01	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	1.500E+01	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	1.180E+02	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	5.200E+01	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	1.600E+01	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	0.000E+00	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	1.830E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	4.780E+02	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	1.000E+00	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	1.000E+00	1.000E+00	---	FLW
	Contamination fraction of irrigation water	1.000E+00	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	5.000E-01	5.000E-01	---	FR9
R018	Contamination fraction of plant food	1.000E+00	-1	---	FPLANT
R018	Contamination fraction of meat	1.000E+00	-1	---	FMEAT

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R018	Contamination fraction of milk	1.000E+00	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	8.500E+00	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	1.700E+01	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	5.000E+01	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	1.600E+02	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	5.000E-01	5.000E-01	---	LSI
R019	Mass loading for foliar deposition (g/m**3)	1.000E-04	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	9.000E-01	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	1.000E+00	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	1.000E+00	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	1.000E+00	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	7.000E-01	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	1.500E+00	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	1.100E+00	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	1.700E-01	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	2.500E-01	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	8.000E-02	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	1.000E-01	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	1.000E+00	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	1.000E+00	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	2.000E+01	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	2.000E-05	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	3.000E-02	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	2.000E-02	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	9.800E-01	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	3.000E-01	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	7.000E-07	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	1.000E-10	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	8.000E-01	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	2.000E-01	2.000E-01	---	AVFG5
C14	DCF correction factor for gaseous forms of C14	8.894E+01	8.894E+01	---	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)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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
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	1	---	---	KYMAX

Summary of Pathway Selections

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

Contaminated Zone Dimensions

Area:	3850.00 square meters
Thickness:	3.00 meters
Cover Depth:	0.00 meters

Initial Soil Concentrations, pCi/g

Ag-108m	6.000E-02
Am-241	1.300E-01
C-14	5.800E-01
Cm-243	2.000E-02
Co-60	5.220E+00
Cs-137	7.460E+00
Eu-152	1.300E-01
Eu-154	1.500E-01
Fe-55	1.980E+00
H-3	6.653E+01
I-129	6.000E-02
Nb-94	3.000E-02
Ni-59	4.500E-01
Ni-63	1.366E+01
Pu-238	4.000E-02
Pu-239	2.000E-02
Pu-241	3.200E-01
Sr-90	3.010E+00
Tc-99	1.200E-01
U-234	1.000E-02

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):	2.577E+02	2.341E+02	2.002E+02	1.222E+02	3.465E+01	1.677E+00	6.095E-01	1.752E-01
M(t):	1.031E+01	9.363E+00	8.009E+00	4.888E+00	1.386E+00	6.706E-02	2.438E-02	7.009E-03

Maximum TDOSE(t): 2.577E+02 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-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ag-108m	1.595E-01	0.0006	3.520E-08	0.0000	0.000E+00	0.0000	4.657E-03	0.0000	9.854E-05	0.0000	3.133E-03	0.0000	4.617E-06	0.0000
Am-241	2.260E-03	0.0000	1.668E-04	0.0000	0.000E+00	0.0000	4.402E-02	0.0002	6.250E-04	0.0000	5.769E-05	0.0000	6.661E-03	0.0000
C-14	1.255E-06	0.0000	8.995E-05	0.0000	0.000E+00	0.0000	4.756E-01	0.0018	2.295E-01	0.0009	1.390E-01	0.0005	6.860E-06	0.0000
Cm-243	4.522E-03	0.0000	1.754E-05	0.0000	0.000E+00	0.0000	4.618E-03	0.0000	2.623E-05	0.0000	6.051E-06	0.0000	6.987E-04	0.0000
Co-60	3.047E+01	0.1182	3.082E-06	0.0000	0.000E+00	0.0000	9.741E-01	0.0038	1.608E-01	0.0006	5.751E-02	0.0002	1.844E-03	0.0000
Cs-137	9.522E+00	0.0370	6.713E-07	0.0000	0.000E+00	0.0000	1.354E+00	0.0053	4.778E-01	0.0019	4.059E-01	0.0016	5.126E-03	0.0000
Eu-152	3.429E-01	0.0013	8.096E-08	0.0000	0.000E+00	0.0000	1.909E-04	0.0000	4.449E-05	0.0000	1.051E-06	0.0000	1.156E-05	0.0000
Eu-154	4.285E-01	0.0017	1.193E-07	0.0000	0.000E+00	0.0000	3.204E-04	0.0000	7.467E-05	0.0000	1.764E-06	0.0000	1.941E-05	0.0000
Fe-55	0.000E+00	0.0000	1.350E-08	0.0000	0.000E+00	0.0000	9.809E-05	0.0000	5.573E-04	0.0000	1.928E-05	0.0000	1.484E-05	0.0000
H-3	0.000E+00	0.0000	1.754E-02	0.0001	0.000E+00	0.0000	6.551E-01	0.0025	3.909E-02	0.0002	7.983E-02	0.0003	3.152E-05	0.0000
I-129	3.085E-04	0.0000	2.941E-08	0.0000	0.000E+00	0.0000	3.006E-02	0.0001	3.950E-03	0.0000	1.604E-02	0.0001	2.272E-04	0.0000
Nb-94	1.114E-01	0.0004	3.591E-08	0.0000	0.000E+00	0.0000	1.992E-04	0.0000	1.954E-09	0.0000	3.386E-08	0.0000	3.017E-06	0.0000
Ni-59	0.000E+00	0.0000	3.504E-09	0.0000	0.000E+00	0.0000	4.382E-04	0.0000	2.268E-05	0.0000	3.004E-04	0.0000	1.328E-06	0.0000
Ni-63	0.000E+00	0.0000	2.469E-07	0.0000	0.000E+00	0.0000	3.642E-02	0.0001	1.884E-03	0.0000	2.496E-02	0.0001	1.103E-04	0.0000
Pu-238	2.484E-06	0.0000	4.517E-05	0.0000	0.000E+00	0.0000	1.187E-02	0.0000	3.371E-04	0.0000	7.779E-06	0.0000	1.796E-03	0.0000
Pu-239	2.342E-06	0.0000	2.482E-05	0.0000	0.000E+00	0.0000	6.593E-03	0.0000	1.872E-04	0.0000	4.320E-06	0.0000	9.976E-04	0.0000
[illegible]241	6.723E-06	0.0000	7.779E-06	0.0000	0.000E+00	0.0000	2.078E-03	0.0000	5.792E-05	0.0000	1.418E-06	0.0000	3.145E-04	0.0000
[illegible]	2.758E-02	0.0001	1.100E-05	0.0000	0.000E+00	0.0000	1.241E+01	0.0482	5.673E-01	0.0022	5.898E-01	0.0023	6.259E-03	0.0000
Tc-99	5.869E-06	0.0000	2.843E-09	0.0000	0.000E+00	0.0000	8.018E-02	0.0003	3.872E-05	0.0000	1.744E-03	0.0000	2.427E-06	0.0000
U-234	1.605E-06	0.0000	3.816E-06	0.0000	0.000E+00	0.0000	6.581E-04	0.0000	2.607E-05	0.0000	1.087E-04	0.0000	3.986E-05	0.0000
Total	4.107E+01	0.1594	1.791E-02	0.0001	0.000E+00	0.0000	1.609E+01	0.0624	1.482E+00	0.0058	1.319E+00	0.0051	2.417E-02	0.0001

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-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ag-108m	6.180E-01	0.0024	2.010E-04	0.0000	0.000E+00	0.0000	3.632E-01	0.0014	2.839E-02	0.0001	1.271E+00	0.0049	2.448E+00	0.0095
Am-241	5.072E-01	0.0020	9.805E-04	0.0000	0.000E+00	0.0000	2.857E-01	0.0011	3.592E-04	0.0000	8.023E-05	0.0000	8.481E-01	0.0033
C-14	1.091E-03	0.0000	3.605E-03	0.0000	0.000E+00	0.0000	1.782E-03	0.0000	9.323E-04	0.0000	1.403E-03	0.0000	8.530E-01	0.0033
Cm-243	5.919E-02	0.0002	1.144E-04	0.0000	0.000E+00	0.0000	3.333E-02	0.0001	1.677E-05	0.0000	9.362E-06	0.0000	1.026E-01	0.0004
Co-60	3.625E+00	0.0141	7.008E-02	0.0003	0.000E+00	0.0000	2.077E+00	0.0081	1.029E+00	0.0040	5.743E-01	0.0022	3.904E+01	0.1515
Cs-137	2.573E+01	0.0999	3.318E+00	0.0129	0.000E+00	0.0000	1.462E+01	0.0568	1.097E+01	0.0426	1.632E+01	0.0633	8.273E+01	0.3211
Eu-152	9.796E-04	0.0000	3.156E-06	0.0000	0.000E+00	0.0000	5.519E-04	0.0000	2.775E-05	0.0000	1.550E-06	0.0000	3.447E-01	0.0013
Eu-154	1.644E-03	0.0000	5.296E-06	0.0000	0.000E+00	0.0000	9.262E-04	0.0000	4.657E-05	0.0000	2.600E-06	0.0000	4.315E-01	0.0017
Fe-55	3.796E-02	0.0001	4.893E-04	0.0000	0.000E+00	0.0000	2.138E-02	0.0001	1.077E-02	0.0000	9.013E-04	0.0000	7.219E-02	0.0003
H-3	2.167E+00	0.0084	1.421E-04	0.0000	0.000E+00	0.0000	1.049E+00	0.0041	1.597E-01	0.0006	4.925E-01	0.0019	4.660E+00	0.0181
I-129	2.231E+00	0.0087	5.755E-03	0.0000	0.000E+00	0.0000	1.263E+00	0.0049	2.226E-01	0.0009	1.770E+00	0.0069	5.543E+00	0.0215
Nb-94	3.145E-04	0.0000	6.080E-06	0.0000	0.000E+00	0.0000	1.775E-04	0.0000	1.337E-09	0.0000	4.976E-08	0.0000	1.121E-01	0.0004
Ni-59	1.396E-03	0.0000	8.995E-06	0.0000	0.000E+00	0.0000	7.946E-04	0.0000	9.899E-05	0.0000	2.210E-03	0.0000	5.271E-03	0.0000
Ni-63	1.160E-01	0.0005	7.475E-04	0.0000	0.000E+00	0.0000	6.604E-02	0.0003	8.227E-03	0.0000	1.837E-01	0.0007	4.381E-01	0.0017
Pu-238	3.748E-02	0.0001	7.245E-05	0.0000	0.000E+00	0.0000	2.111E-02	0.0001	5.308E-05	0.0000	2.969E-06	0.0000	7.277E-02	0.0003
Pu-239	2.081E-02	0.0001	4.023E-05	0.0000	0.000E+00	0.0000	1.172E-02	0.0000	2.947E-05	0.0000	1.646E-06	0.0000	4.041E-02	0.0002
[illegible]241	9.251E-03	0.0000	1.784E-05	0.0000	0.000E+00	0.0000	5.196E-03	0.0000	1.091E-05	0.0000	9.533E-07	0.0000	1.694E-02	0.0001
[illegible]	5.654E+01	0.2194	2.187E-01	0.0008	0.000E+00	0.0000	3.395E+01	0.1318	6.476E+00	0.0251	9.006E+00	0.0350	1.198E+02	0.4649
Tc-99	1.509E-02	0.0001	1.946E-05	0.0000	0.000E+00	0.0000	1.779E-02	0.0001	2.340E-05	0.0000	1.284E-03	0.0000	1.162E-01	0.0005
U-234	6.367E-03	0.0000	4.103E-06	0.0000	0.000E+00	0.0000	3.587E-03	0.0000	3.066E-05	0.0000	3.022E-04	0.0000	1.113E-02	0.0000
Total	9.173E+01	0.3560	3.619E+00	0.0140	0.000E+00	0.0000	5.380E+01	0.2088	1.891E+01	0.0734	2.962E+01	0.1149	2.577E+02	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-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ag-108m	7.856E-02	0.0003	1.734E-08	0.0000	0.000E+00	0.0000	2.304E-03	0.0000	4.947E-05	0.0000	1.565E-03	0.0000	2.275E-06	0.0000
Am-241	2.256E-03	0.0000	1.664E-04	0.0000	0.000E+00	0.0000	4.393E-02	0.0002	6.238E-04	0.0000	5.757E-05	0.0000	6.648E-03	0.0000
C-14	1.363E-07	0.0000	9.766E-06	0.0000	0.000E+00	0.0000	5.294E-02	0.0002	2.773E-02	0.0001	1.633E-02	0.0001	7.448E-07	0.0000
Cm-243	4.412E-03	0.0000	1.711E-05	0.0000	0.000E+00	0.0000	4.505E-03	0.0000	2.559E-05	0.0000	5.903E-06	0.0000	6.816E-04	0.0000
Co-60	2.643E+01	0.1129	2.674E-06	0.0000	0.000E+00	0.0000	8.451E-01	0.0036	1.395E-01	0.0006	4.989E-02	0.0002	1.600E-03	0.0000
Cs-137	9.054E+00	0.0387	6.383E-07	0.0000	0.000E+00	0.0000	1.288E+00	0.0055	4.546E-01	0.0019	3.861E-01	0.0016	4.874E-03	0.0000
Eu-152	3.253E-01	0.0014	7.682E-08	0.0000	0.000E+00	0.0000	1.812E-04	0.0000	4.222E-05	0.0000	9.972E-07	0.0000	1.097E-05	0.0000
Eu-154	3.958E-01	0.0017	1.102E-07	0.0000	0.000E+00	0.0000	2.960E-04	0.0000	6.898E-05	0.0000	1.629E-06	0.0000	1.793E-05	0.0000
Fe-55	0.000E+00	0.0000	1.030E-08	0.0000	0.000E+00	0.0000	7.484E-05	0.0000	4.252E-04	0.0000	1.471E-05	0.0000	1.132E-05	0.0000
H-3	0.000E+00	0.0000	4.063E-03	0.0000	0.000E+00	0.0000	1.535E-01	0.0007	9.582E-03	0.0000	1.927E-02	0.0001	7.302E-06	0.0000
I-129	2.924E-04	0.0000	2.788E-08	0.0000	0.000E+00	0.0000	2.851E-02	0.0001	3.748E-03	0.0000	1.521E-02	0.0001	2.154E-04	0.0000
Nb-94	1.114E-01	0.0005	3.589E-08	0.0000	0.000E+00	0.0000	1.991E-04	0.0000	1.953E-09	0.0000	3.384E-08	0.0000	3.016E-06	0.0000
Ni-59	0.000E+00	0.0000	3.484E-09	0.0000	0.000E+00	0.0000	4.358E-04	0.0000	2.255E-05	0.0000	2.987E-04	0.0000	1.320E-06	0.0000
Ni-63	0.000E+00	0.0000	2.437E-07	0.0000	0.000E+00	0.0000	3.595E-02	0.0002	1.860E-03	0.0000	2.464E-02	0.0001	1.089E-04	0.0000
Pu-238	2.464E-06	0.0000	4.481E-05	0.0000	0.000E+00	0.0000	1.178E-02	0.0001	3.344E-04	0.0000	7.718E-06	0.0000	1.782E-03	0.0000
Pu-239	2.342E-06	0.0000	2.481E-05	0.0000	0.000E+00	0.0000	6.592E-03	0.0000	1.872E-04	0.0000	4.319E-06	0.0000	9.974E-04	0.0000
[illegible]41	1.511E-05	0.0000	8.055E-06	0.0000	0.000E+00	0.0000	2.150E-03	0.0000	5.761E-05	0.0000	1.573E-06	0.0000	3.253E-04	0.0000
[illegible]0	2.564E-02	0.0001	1.023E-05	0.0000	0.000E+00	0.0000	1.154E+01	0.0493	5.280E-01	0.0023	5.488E-01	0.0023	5.819E-03	0.0000
Tc-99	5.674E-06	0.0000	2.749E-09	0.0000	0.000E+00	0.0000	7.753E-02	0.0003	3.746E-05	0.0000	1.687E-03	0.0000	2.347E-06	0.0000
U-234	1.604E-06	0.0000	3.813E-06	0.0000	0.000E+00	0.0000	6.575E-04	0.0000	2.605E-05	0.0000	1.086E-04	0.0000	3.983E-05	0.0000
Total	3.643E+01	0.1556	4.352E-03	0.0000	0.000E+00	0.0000	1.409E+01	0.0602	1.167E+00	0.0050	1.064E+00	0.0045	2.315E-02	0.0001

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-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ag-108m	3.045E-01	0.0013	9.925E-05	0.0000	0.000E+00	0.0000	1.795E-01	0.0008	1.423E-02	0.0001	6.319E-01	0.0027	1.213E+00	0.0052
Am-241	5.061E-01	0.0022	9.782E-04	0.0000	0.000E+00	0.0000	2.850E-01	0.0012	3.584E-04	0.0000	8.004E-05	0.0000	8.462E-01	0.0036
C-14	1.185E-04	0.0000	3.963E-04	0.0000	0.000E+00	0.0000	1.985E-04	0.0000	1.083E-04	0.0000	1.549E-04	0.0000	9.799E-02	0.0004
Cm-243	5.772E-02	0.0002	1.116E-04	0.0000	0.000E+00	0.0000	3.251E-02	0.0001	1.635E-05	0.0000	9.130E-06	0.0000	1.000E-01	0.0004
Co-60	3.143E+00	0.0134	6.077E-02	0.0003	0.000E+00	0.0000	1.801E+00	0.0077	8.928E-01	0.0038	4.981E-01	0.0021	3.386E+01	0.1447
Cs-137	2.446E+01	0.1045	3.154E+00	0.0135	0.000E+00	0.0000	1.390E+01	0.0594	1.044E+01	0.0446	1.551E+01	0.0663	7.866E+01	0.3360
Eu-152	9.292E-04	0.0000	2.994E-06	0.0000	0.000E+00	0.0000	5.235E-04	0.0000	2.632E-05	0.0000	1.470E-06	0.0000	3.270E-01	0.0014
Eu-154	1.518E-03	0.0000	4.891E-06	0.0000	0.000E+00	0.0000	8.553E-04	0.0000	4.301E-05	0.0000	2.401E-06	0.0000	3.986E-01	0.0017
Fe-55	2.895E-02	0.0001	3.732E-04	0.0000	0.000E+00	0.0000	1.631E-02	0.0001	8.214E-03	0.0000	6.874E-04	0.0000	5.506E-02	0.0002
H-3	5.022E-01	0.0021	3.312E-05	0.0000	0.000E+00	0.0000	2.458E-01	0.0011	3.796E-02	0.0002	1.148E-01	0.0005	1.087E+00	0.0046
I-129	2.115E+00	0.0090	5.455E-03	0.0000	0.000E+00	0.0000	1.197E+00	0.0051	2.112E-01	0.0009	1.679E+00	0.0072	5.255E+00	0.0225
Nb-94	3.143E-04	0.0000	6.075E-06	0.0000	0.000E+00	0.0000	1.773E-04	0.0000	1.335E-09	0.0000	4.971E-08	0.0000	1.121E-01	0.0005
Ni-59	1.387E-03	0.0000	8.941E-06	0.0000	0.000E+00	0.0000	7.899E-04	0.0000	9.840E-05	0.0000	2.197E-03	0.0000	5.240E-03	0.0000
Ni-63	1.145E-01	0.0005	7.377E-04	0.0000	0.000E+00	0.0000	6.517E-02	0.0003	8.119E-03	0.0000	1.813E-01	0.0008	4.323E-01	0.0018
Pu-238	3.717E-02	0.0002	7.164E-05	0.0000	0.000E+00	0.0000	2.093E-02	0.0001	5.264E-05	0.0000	2.947E-06	0.0000	7.217E-02	0.0003
Pu-239	2.080E-02	0.0001	4.021E-05	0.0000	0.000E+00	0.0000	1.171E-02	0.0001	2.946E-05	0.0000	1.645E-06	0.0000	4.040E-02	0.0002
[illegible]241	1.086E-02	0.0000	2.094E-05	0.0000	0.000E+00	0.0000	6.098E-03	0.0000	1.183E-05	0.0000	1.229E-06	0.0000	1.955E-02	0.0001
	5.255E+01	0.2245	2.033E-01	0.0009	0.000E+00	0.0000	3.156E+01	0.1348	6.024E+00	0.0257	8.375E+00	0.0358	1.114E+02	0.4758
Tc-99	1.459E-02	0.0001	1.881E-05	0.0000	0.000E+00	0.0000	1.720E-02	0.0001	2.263E-05	0.0000	1.241E-03	0.0000	1.123E-01	0.0005
U-234	6.360E-03	0.0000	4.098E-06	0.0000	0.000E+00	0.0000	3.583E-03	0.0000	3.063E-05	0.0000	3.018E-04	0.0000	1.112E-02	0.0000
Total	8.388E+01	0.3584	3.426E+00	0.0146	0.000E+00	0.0000	4.935E+01	0.2108	1.764E+01	0.0753	2.700E+01	0.1153	2.341E+02	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 = 3.00E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ag-108m	1.907E-02	0.0001	4.209E-09	0.0000	0.000E+00	0.0000	5.593E-04	0.0000	1.201E-05	0.0000	3.799E-04	0.0000	5.521E-07	0.0000
Am-241	2.247E-03	0.0000	1.658E-04	0.0000	0.000E+00	0.0000	4.376E-02	0.0002	6.213E-04	0.0000	5.734E-05	0.0000	6.621E-03	0.0000
C-14	1.600E-09	0.0000	1.147E-07	0.0000	0.000E+00	0.0000	6.216E-04	0.0000	3.257E-04	0.0000	1.918E-04	0.0000	8.744E-09	0.0000
Cm-243	4.198E-03	0.0000	1.629E-05	0.0000	0.000E+00	0.0000	4.287E-03	0.0000	2.436E-05	0.0000	5.618E-06	0.0000	6.487E-04	0.0000
Co-60	1.989E+01	0.0993	2.012E-06	0.0000	0.000E+00	0.0000	6.359E-01	0.0032	1.050E-01	0.0005	3.754E-02	0.0002	1.204E-03	0.0000
Cs-137	8.186E+00	0.0409	5.771E-07	0.0000	0.000E+00	0.0000	1.164E+00	0.0058	4.110E-01	0.0021	3.491E-01	0.0017	4.406E-03	0.0000
Eu-152	2.929E-01	0.0015	6.917E-08	0.0000	0.000E+00	0.0000	1.631E-04	0.0000	3.801E-05	0.0000	8.978E-07	0.0000	9.880E-06	0.0000
Eu-154	3.378E-01	0.0017	9.406E-08	0.0000	0.000E+00	0.0000	2.526E-04	0.0000	5.887E-05	0.0000	1.390E-06	0.0000	1.530E-05	0.0000
Fe-55	0.000E+00	0.0000	5.993E-09	0.0000	0.000E+00	0.0000	4.356E-05	0.0000	2.475E-04	0.0000	8.558E-06	0.0000	6.588E-06	0.0000
H-3	0.000E+00	0.0000	2.177E-04	0.0000	0.000E+00	0.0000	8.224E-03	0.0000	5.135E-04	0.0000	1.033E-03	0.0000	3.912E-07	0.0000
I-129	2.629E-04	0.0000	2.506E-08	0.0000	0.000E+00	0.0000	2.562E-02	0.0001	3.369E-03	0.0000	1.367E-02	0.0001	1.936E-04	0.0000
Nb-94	1.112E-01	0.0006	3.585E-08	0.0000	0.000E+00	0.0000	1.988E-04	0.0000	1.951E-09	0.0000	3.380E-08	0.0000	3.012E-06	0.0000
Ni-59	0.000E+00	0.0000	3.445E-09	0.0000	0.000E+00	0.0000	4.308E-04	0.0000	2.229E-05	0.0000	2.952E-04	0.0000	1.305E-06	0.0000
Ni-63	0.000E+00	0.0000	2.375E-07	0.0000	0.000E+00	0.0000	3.504E-02	0.0002	1.813E-03	0.0000	2.401E-02	0.0001	1.061E-04	0.0000
Pu-238	2.425E-06	0.0000	4.410E-05	0.0000	0.000E+00	0.0000	1.159E-02	0.0001	3.291E-04	0.0000	7.598E-06	0.0000	1.754E-03	0.0000
Pu-239	2.341E-06	0.0000	2.480E-05	0.0000	0.000E+00	0.0000	6.590E-03	0.0000	1.871E-04	0.0000	4.318E-06	0.0000	9.971E-04	0.0000
[illegible]241	3.066E-05	0.0000	8.564E-06	0.0000	0.000E+00	0.0000	2.282E-03	0.0000	5.700E-05	0.0000	1.861E-06	0.0000	3.453E-04	0.0000
[illegible]	2.217E-02	0.0001	8.840E-06	0.0000	0.000E+00	0.0000	9.975E+00	0.0498	4.564E-01	0.0023	4.744E-01	0.0024	5.030E-03	0.0000
[illegible]9	5.303E-06	0.0000	2.569E-09	0.0000	0.000E+00	0.0000	7.246E-02	0.0004	3.501E-05	0.0000	1.577E-03	0.0000	2.193E-06	0.0000
U-234	1.602E-06	0.0000	3.807E-06	0.0000	0.000E+00	0.0000	6.564E-04	0.0000	2.600E-05	0.0000	1.084E-04	0.0000	3.976E-05	0.0000
Total	2.887E+01	0.1442	4.931E-04	0.0000	0.000E+00	0.0000	1.199E+01	0.0599	9.800E-01	0.0049	9.024E-01	0.0045	2.138E-02	0.0001

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-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ag-108m	7.386E-02	0.0004	2.408E-05	0.0000	0.000E+00	0.0000	4.353E-02	0.0002	3.452E-03	0.0000	1.533E-01	0.0008	2.942E-01	0.0015
Am-241	5.037E-01	0.0025	9.737E-04	0.0000	0.000E+00	0.0000	2.837E-01	0.0014	3.567E-04	0.0000	7.967E-05	0.0000	8.422E-01	0.0042
C-14	1.389E-06	0.0000	4.645E-06	0.0000	0.000E+00	0.0000	2.327E-06	0.0000	1.270E-06	0.0000	1.816E-06	0.0000	1.151E-03	0.0000
Cm-243	5.489E-02	0.0003	1.061E-04	0.0000	0.000E+00	0.0000	3.092E-02	0.0002	1.555E-05	0.0000	8.683E-06	0.0000	9.512E-02	0.0005
Co-60	2.364E+00	0.0118	4.570E-02	0.0002	0.000E+00	0.0000	1.354E+00	0.0068	6.713E-01	0.0034	3.745E-01	0.0019	2.548E+01	0.1273
Cs-137	2.210E+01	0.1104	2.850E+00	0.0142	0.000E+00	0.0000	1.256E+01	0.0627	9.430E+00	0.0471	1.402E+01	0.0700	7.107E+01	0.3550
Eu-152	8.361E-04	0.0000	2.694E-06	0.0000	0.000E+00	0.0000	4.711E-04	0.0000	2.368E-05	0.0000	1.323E-06	0.0000	2.945E-01	0.0015
Eu-154	1.295E-03	0.0000	4.172E-06	0.0000	0.000E+00	0.0000	7.295E-04	0.0000	3.668E-05	0.0000	2.048E-06	0.0000	3.402E-01	0.0017
Fe-55	1.684E-02	0.0001	2.170E-04	0.0000	0.000E+00	0.0000	9.485E-03	0.0000	4.778E-03	0.0000	3.998E-04	0.0000	3.202E-02	0.0002
H-3	2.688E-02	0.0001	1.773E-06	0.0000	0.000E+00	0.0000	1.316E-02	0.0001	2.032E-03	0.0000	6.145E-03	0.0000	5.820E-02	0.0003
I-129	1.900E+00	0.0095	4.900E-03	0.0000	0.000E+00	0.0000	1.075E+00	0.0054	1.897E-01	0.0009	1.508E+00	0.0075	4.721E+00	0.0236
Nb-94	3.137E-04	0.0000	6.063E-06	0.0000	0.000E+00	0.0000	1.770E-04	0.0000	1.333E-09	0.0000	4.962E-08	0.0000	1.119E-01	0.0006
Ni-59	1.371E-03	0.0000	8.833E-06	0.0000	0.000E+00	0.0000	7.803E-04	0.0000	9.722E-05	0.0000	2.170E-03	0.0000	5.177E-03	0.0000
Ni-63	1.115E-01	0.0006	7.183E-04	0.0000	0.000E+00	0.0000	6.346E-02	0.0003	7.906E-03	0.0000	1.765E-01	0.0009	4.210E-01	0.0021
Pu-238	3.655E-02	0.0002	7.065E-05	0.0000	0.000E+00	0.0000	2.059E-02	0.0001	5.176E-05	0.0000	2.905E-06	0.0000	7.099E-02	0.0004
Pu-239	2.078E-02	0.0001	4.017E-05	0.0000	0.000E+00	0.0000	1.170E-02	0.0001	2.943E-05	0.0000	1.643E-06	0.0000	4.036E-02	0.0002
[illegible]241	1.383E-02	0.0001	2.669E-05	0.0000	0.000E+00	0.0000	7.774E-03	0.0000	1.355E-05	0.0000	1.745E-06	0.0000	2.437E-02	0.0001
[illegible]	4.539E+01	0.2267	1.756E-01	0.0009	0.000E+00	0.0000	2.726E+01	0.1362	5.204E+00	0.0260	7.234E+00	0.0361	9.620E+01	0.4805
Tc-99	1.362E-02	0.0001	1.757E-05	0.0000	0.000E+00	0.0000	1.606E-02	0.0001	2.114E-05	0.0000	1.159E-03	0.0000	1.050E-01	0.0005
U-234	6.344E-03	0.0000	4.088E-06	0.0000	0.000E+00	0.0000	3.574E-03	0.0000	3.055E-05	0.0000	3.011E-04	0.0000	1.109E-02	0.0001
Total	7.264E+01	0.3628	3.078E+00	0.0154	0.000E+00	0.0000	4.276E+01	0.2136	1.551E+01	0.0775	2.347E+01	0.1172	2.002E+02	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-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ag-108m	1.344E-04	0.0000	2.966E-11	0.0000	0.000E+00	0.0000	3.941E-06	0.0000	8.461E-08	0.0000	2.677E-06	0.0000	3.891E-09	0.0000
Am-241	2.215E-03	0.0000	1.635E-04	0.0000	0.000E+00	0.0000	4.315E-02	0.0004	6.126E-04	0.0000	5.653E-05	0.0000	6.528E-03	0.0001
C-14	2.673E-16	0.0000	1.916E-14	0.0000	0.000E+00	0.0000	1.039E-10	0.0000	5.452E-11	0.0000	3.209E-11	0.0000	1.461E-15	0.0000
Cm-243	3.530E-03	0.0000	1.370E-05	0.0000	0.000E+00	0.0000	3.606E-03	0.0000	2.052E-05	0.0000	4.724E-06	0.0000	5.456E-04	0.0000
Co-60	7.351E+00	0.0602	7.436E-07	0.0000	0.000E+00	0.0000	2.350E-01	0.0019	3.880E-02	0.0003	1.388E-02	0.0001	4.449E-04	0.0000
Cs-137	5.752E+00	0.0471	4.055E-07	0.0000	0.000E+00	0.0000	8.182E-01	0.0067	2.888E-01	0.0024	2.453E-01	0.0020	3.096E-03	0.0000
Eu-152	2.029E-01	0.0017	4.791E-08	0.0000	0.000E+00	0.0000	1.130E-04	0.0000	2.633E-05	0.0000	6.219E-07	0.0000	6.844E-06	0.0000
Eu-154	1.940E-01	0.0016	5.402E-08	0.0000	0.000E+00	0.0000	1.451E-04	0.0000	3.381E-05	0.0000	7.985E-07	0.0000	8.787E-06	0.0000
Fe-55	0.000E+00	0.0000	9.013E-10	0.0000	0.000E+00	0.0000	6.551E-06	0.0000	3.722E-05	0.0000	1.287E-06	0.0000	9.908E-07	0.0000
H-3	0.000E+00	0.0000	7.635E-09	0.0000	0.000E+00	0.0000	2.884E-07	0.0000	1.802E-08	0.0000	3.623E-08	0.0000	1.372E-11	0.0000
I-129	1.810E-04	0.0000	1.725E-08	0.0000	0.000E+00	0.0000	1.764E-02	0.0001	2.320E-03	0.0000	9.414E-03	0.0001	1.333E-04	0.0000
Nb-94	1.108E-01	0.0009	3.570E-08	0.0000	0.000E+00	0.0000	1.980E-04	0.0000	1.943E-09	0.0000	3.366E-08	0.0000	2.999E-06	0.0000
Ni-59	0.000E+00	0.0000	3.309E-09	0.0000	0.000E+00	0.0000	4.138E-04	0.0000	2.141E-05	0.0000	2.836E-04	0.0000	1.254E-06	0.0000
Ni-63	0.000E+00	0.0000	2.169E-07	0.0000	0.000E+00	0.0000	3.200E-02	0.0003	1.656E-03	0.0000	2.193E-02	0.0002	9.695E-05	0.0000
Pu-238	2.293E-06	0.0000	4.169E-05	0.0000	0.000E+00	0.0000	1.096E-02	0.0001	3.112E-04	0.0000	7.192E-06	0.0000	1.658E-03	0.0000
Pu-239	2.339E-06	0.0000	2.478E-05	0.0000	0.000E+00	0.0000	6.583E-03	0.0001	1.869E-04	0.0000	4.313E-06	0.0000	9.962E-04	0.0000
Pu-241	7.417E-05	0.0000	9.968E-06	0.0000	0.000E+00	0.0000	2.647E-03	0.0000	5.512E-05	0.0000	2.662E-06	0.0000	4.005E-04	0.0000
Ra-226	1.331E-02	0.0001	5.308E-06	0.0000	0.000E+00	0.0000	5.989E+00	0.0490	2.741E-01	0.0022	2.849E-01	0.0023	3.020E-03	0.0000
Tc-99	4.186E-06	0.0000	2.028E-09	0.0000	0.000E+00	0.0000	5.720E-02	0.0005	2.764E-05	0.0000	1.245E-03	0.0000	1.731E-06	0.0000
U-234	1.601E-06	0.0000	3.784E-06	0.0000	0.000E+00	0.0000	6.524E-04	0.0000	2.585E-05	0.0000	1.077E-04	0.0000	3.952E-05	0.0000
Total	1.363E+01	0.1115	2.642E-04	0.0000	0.000E+00	0.0000	7.218E+00	0.0591	6.070E-01	0.0050	5.771E-01	0.0047	1.698E-02	0.0001

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-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ag-108m	5.192E-04	0.0000	1.692E-07	0.0000	0.000E+00	0.0000	3.060E-04	0.0000	2.427E-05	0.0000	1.078E-03	0.0000	2.068E-03	0.0000
Am-241	4.955E-01	0.0041	9.578E-04	0.0000	0.000E+00	0.0000	2.790E-01	0.0023	3.509E-04	0.0000	7.837E-05	0.0000	8.286E-01	0.0068
C-14	2.308E-13	0.0000	7.717E-13	0.0000	0.000E+00	0.0000	3.866E-13	0.0000	2.110E-13	0.0000	3.016E-13	0.0000	1.924E-10	0.0000
Cm-243	4.605E-02	0.0004	8.902E-05	0.0000	0.000E+00	0.0000	2.594E-02	0.0002	1.305E-05	0.0000	7.283E-06	0.0000	7.982E-02	0.0007
Co-60	8.715E-01	0.0071	1.685E-02	0.0001	0.000E+00	0.0000	4.994E-01	0.0041	2.475E-01	0.0020	1.381E-01	0.0011	9.412E+00	0.0770
Cs-137	1.549E+01	0.1268	1.998E+00	0.0163	0.000E+00	0.0000	8.806E+00	0.0721	6.611E+00	0.0541	9.826E+00	0.0804	4.984E+01	0.4079
Eu-152	5.778E-04	0.0000	1.862E-06	0.0000	0.000E+00	0.0000	3.255E-04	0.0000	1.637E-05	0.0000	9.139E-07	0.0000	2.040E-01	0.0017
Eu-154	7.419E-04	0.0000	2.390E-06	0.0000	0.000E+00	0.0000	4.180E-04	0.0000	2.102E-05	0.0000	1.174E-06	0.0000	1.954E-01	0.0016
Fe-55	2.526E-03	0.0000	3.256E-05	0.0000	0.000E+00	0.0000	1.423E-03	0.0000	7.169E-04	0.0000	5.999E-05	0.0000	4.805E-03	0.0000
H-3	9.395E-07	0.0000	6.197E-11	0.0000	0.000E+00	0.0000	4.599E-07	0.0000	7.103E-08	0.0000	2.148E-07	0.0000	2.036E-06	0.0000
I-129	1.305E+00	0.0107	3.366E-03	0.0000	0.000E+00	0.0000	7.388E-01	0.0060	1.303E-01	0.0011	1.036E+00	0.0085	3.243E+00	0.0265
Nb-94	3.116E-04	0.0000	6.024E-06	0.0000	0.000E+00	0.0000	1.759E-04	0.0000	1.324E-09	0.0000	4.930E-08	0.0000	1.115E-01	0.0009
Ni-59	1.314E-03	0.0000	8.466E-06	0.0000	0.000E+00	0.0000	7.479E-04	0.0000	9.317E-05	0.0000	2.080E-03	0.0000	4.964E-03	0.0000
Ni-63	1.016E-01	0.0008	6.546E-04	0.0000	0.000E+00	0.0000	5.783E-02	0.0005	7.205E-03	0.0001	1.608E-01	0.0013	3.838E-01	0.0031
Pu-238	3.448E-02	0.0003	6.664E-05	0.0000	0.000E+00	0.0000	1.942E-02	0.0002	4.883E-05	0.0000	2.764E-06	0.0000	6.699E-02	0.0005
Pu-239	2.071E-02	0.0002	4.004E-05	0.0000	0.000E+00	0.0000	1.166E-02	0.0001	2.933E-05	0.0000	1.638E-06	0.0000	4.025E-02	0.0003
[illegible]41	2.209E-02	0.0002	4.268E-05	0.0000	0.000E+00	0.0000	1.243E-02	0.0001	1.832E-05	0.0000	3.179E-06	0.0000	3.778E-02	0.0003
	2.719E+01	0.2225	1.052E-01	0.0009	0.000E+00	0.0000	1.633E+01	0.1336	3.117E+00	0.0255	4.334E+00	0.0355	5.765E+01	0.4717
Tc-99	1.073E-02	0.0001	1.383E-05	0.0000	0.000E+00	0.0000	1.265E-02	0.0001	1.664E-05	0.0000	9.130E-04	0.0000	8.280E-02	0.0007
U-234	6.291E-03	0.0001	4.054E-06	0.0000	0.000E+00	0.0000	3.544E-03	0.0000	3.030E-05	0.0000	2.985E-04	0.0000	1.100E-02	0.0001
Total	4.561E+01	0.3732	2.125E+00	0.0174	0.000E+00	0.0000	2.680E+01	0.2193	1.012E+01	0.0828	1.550E+01	0.1268	1.222E+02	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-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ag-108m	9.540E-11	0.0000	2.106E-17	0.0000	0.000E+00	0.0000	2.798E-12	0.0000	6.008E-14	0.0000	1.901E-12	0.0000	2.762E-15	0.0000
Am-241	2.128E-03	0.0001	1.570E-04	0.0000	0.000E+00	0.0000	4.145E-02	0.0012	5.865E-04	0.0000	5.430E-05	0.0000	6.270E-03	0.0002
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.010E-30	0.0000	1.586E-30	0.0000	9.321E-31	0.0000	0.000E+00	0.0000
Cm-243	2.150E-03	0.0001	8.356E-06	0.0000	0.000E+00	0.0000	2.200E-03	0.0001	1.258E-05	0.0000	2.880E-06	0.0000	3.328E-04	0.0000
Co-60	4.278E-01	0.0123	4.327E-08	0.0000	0.000E+00	0.0000	1.368E-02	0.0004	2.258E-03	0.0001	8.075E-04	0.0000	2.589E-05	0.0000
Cs-137	2.099E+00	0.0606	1.480E-07	0.0000	0.000E+00	0.0000	2.986E-01	0.0086	1.054E-01	0.0030	8.951E-02	0.0026	1.130E-03	0.0000
Eu-152	7.106E-02	0.0021	1.676E-08	0.0000	0.000E+00	0.0000	3.957E-05	0.0000	9.222E-06	0.0000	2.178E-07	0.0000	2.397E-06	0.0000
Eu-154	3.978E-02	0.0011	1.108E-08	0.0000	0.000E+00	0.0000	2.975E-05	0.0000	6.932E-06	0.0000	1.637E-07	0.0000	1.802E-06	0.0000
Fe-55	0.000E+00	0.0000	4.019E-12	0.0000	0.000E+00	0.0000	2.921E-08	0.0000	1.659E-07	0.0000	5.739E-09	0.0000	4.418E-09	0.0000
H-3	0.000E+00	0.0000	1.254E-21	0.0000	0.000E+00	0.0000	4.738E-20	0.0000	2.964E-21	0.0000	5.956E-21	0.0000	2.253E-24	0.0000
I-129	6.231E-05	0.0000	5.941E-09	0.0000	0.000E+00	0.0000	6.074E-03	0.0002	7.986E-04	0.0000	3.241E-03	0.0001	4.591E-05	0.0000
Nb-94	1.094E-01	0.0032	3.527E-08	0.0000	0.000E+00	0.0000	1.956E-04	0.0000	1.919E-09	0.0000	3.326E-08	0.0000	2.963E-06	0.0000
Ni-59	0.000E+00	0.0000	2.951E-09	0.0000	0.000E+00	0.0000	3.690E-04	0.0000	1.910E-05	0.0000	2.529E-04	0.0000	1.118E-06	0.0000
Ni-63	0.000E+00	0.0000	1.675E-07	0.0000	0.000E+00	0.0000	2.470E-02	0.0007	1.278E-03	0.0000	1.693E-02	0.0005	7.484E-05	0.0000
Pu-238	1.954E-06	0.0000	3.552E-05	0.0000	0.000E+00	0.0000	9.336E-03	0.0003	2.651E-04	0.0000	6.149E-06	0.0000	1.413E-03	0.0000
Pu-239	2.333E-06	0.0000	2.471E-05	0.0000	0.000E+00	0.0000	6.565E-03	0.0002	1.864E-04	0.0000	4.301E-06	0.0000	9.933E-04	0.0000
[illegible]-241	1.379E-04	0.0000	1.189E-05	0.0000	0.000E+00	0.0000	3.143E-03	0.0001	5.132E-05	0.0000	3.811E-06	0.0000	4.756E-04	0.0000
	3.099E-03	0.0001	1.236E-06	0.0000	0.000E+00	0.0000	1.395E+00	0.0402	6.382E-02	0.0018	6.633E-02	0.0019	7.033E-04	0.0000
Tc-99	2.129E-06	0.0000	1.031E-09	0.0000	0.000E+00	0.0000	2.909E-02	0.0008	1.406E-05	0.0000	6.332E-04	0.0000	8.807E-07	0.0000
U-234	1.641E-06	0.0000	3.720E-06	0.0000	0.000E+00	0.0000	6.413E-04	0.0000	2.540E-05	0.0000	1.059E-04	0.0000	3.885E-05	0.0000
Total	2.755E+00	0.0795	2.428E-04	0.0000	0.000E+00	0.0000	1.831E+00	0.0528	1.747E-01	0.0050	1.779E-01	0.0051	1.151E-02	0.0003

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-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ag-108m	3.662E-10	0.0000	1.194E-13	0.0000	0.000E+00	0.0000	2.158E-10	0.0000	1.712E-11	0.0000	7.600E-10	0.0000	1.459E-09	0.0000
Am-241	4.727E-01	0.0136	9.137E-04	0.0000	0.000E+00	0.0000	2.662E-01	0.0077	3.349E-04	0.0000	7.477E-05	0.0000	7.909E-01	0.0228
C-14	0.000E+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	5.528E-30	0.0000
Cm-243	2.788E-02	0.0008	5.389E-05	0.0000	0.000E+00	0.0000	1.570E-02	0.0005	7.915E-06	0.0000	4.409E-06	0.0000	4.835E-02	0.0014
Co-60	5.038E-02	0.0015	9.740E-04	0.0000	0.000E+00	0.0000	2.887E-02	0.0008	1.431E-02	0.0004	7.983E-03	0.0002	5.471E-01	0.0158
Cs-137	5.616E+00	0.1621	7.241E-01	0.0209	0.000E+00	0.0000	3.192E+00	0.0921	2.396E+00	0.0692	3.562E+00	0.1028	1.808E+01	0.5219
Eu-152	2.010E-04	0.0000	6.476E-07	0.0000	0.000E+00	0.0000	1.132E-04	0.0000	5.694E-06	0.0000	3.179E-07	0.0000	7.143E-02	0.0021
Eu-154	1.511E-04	0.0000	4.868E-07	0.0000	0.000E+00	0.0000	8.513E-05	0.0000	4.280E-06	0.0000	2.390E-07	0.0000	4.006E-02	0.0012
Fe-55	1.119E-05	0.0000	1.442E-07	0.0000	0.000E+00	0.0000	6.304E-06	0.0000	3.175E-06	0.0000	2.657E-07	0.0000	2.128E-05	0.0000
H-3	1.528E-19	0.0000	1.008E-23	0.0000	0.000E+00	0.0000	7.479E-20	0.0000	1.155E-20	0.0000	3.493E-20	0.0000	3.316E-19	0.0000
I-129	4.462E-01	0.0129	1.151E-03	0.0000	0.000E+00	0.0000	2.526E-01	0.0073	4.456E-02	0.0013	3.542E-01	0.0102	1.109E+00	0.0320
Nb-94	3.058E-04	0.0000	5.912E-06	0.0000	0.000E+00	0.0000	1.726E-04	0.0000	1.300E-09	0.0000	4.838E-08	0.0000	1.101E-01	0.0032
Ni-59	1.164E-03	0.0000	7.498E-06	0.0000	0.000E+00	0.0000	6.624E-04	0.0000	8.253E-05	0.0000	1.842E-03	0.0001	4.401E-03	0.0001
Ni-63	7.789E-02	0.0022	5.019E-04	0.0000	0.000E+00	0.0000	4.434E-02	0.0013	5.524E-03	0.0002	1.233E-01	0.0036	2.946E-01	0.0085
Pu-238	2.918E-02	0.0008	5.640E-05	0.0000	0.000E+00	0.0000	1.643E-02	0.0005	4.133E-05	0.0000	2.401E-06	0.0000	5.676E-02	0.0016
Pu-239	2.051E-02	0.0006	3.966E-05	0.0000	0.000E+00	0.0000	1.155E-02	0.0003	2.905E-05	0.0000	1.622E-06	0.0000	3.991E-02	0.0012
Pu-241	3.386E-02	0.0010	6.545E-05	0.0000	0.000E+00	0.0000	1.907E-02	0.0006	2.500E-05	0.0000	5.237E-06	0.0000	5.685E-02	0.0016
[illegible]	6.290E+00	0.1815	2.434E-02	0.0007	0.000E+00	0.0000	3.777E+00	0.1090	7.211E-01	0.0208	1.002E+00	0.0289	1.334E+01	0.3851
Tc-99	5.421E-03	0.0002	6.990E-06	0.0000	0.000E+00	0.0000	6.391E-03	0.0002	8.409E-06	0.0000	4.613E-04	0.0000	4.203E-02	0.0012
U-234	6.141E-03	0.0002	3.961E-06	0.0000	0.000E+00	0.0000	3.460E-03	0.0001	2.958E-05	0.0000	2.914E-04	0.0000	1.074E-02	0.0003
Total	1.308E+01	0.3774	7.522E-01	0.0217	0.000E+00	0.0000	7.635E+00	0.2203	3.182E+00	0.0918	5.052E+00	0.1458	3.465E+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-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ag-108m	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Am-241	1.849E-03	0.0011	1.363E-04	0.0001	0.000E+00	0.0000	3.601E-02	0.0215	5.114E-04	0.0003	4.715E-05	0.0000	5.444E-03	0.0032
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cm-243	3.794E-04	0.0002	1.498E-06	0.0000	0.000E+00	0.0000	3.943E-04	0.0002	2.398E-06	0.0000	5.122E-07	0.0000	5.967E-05	0.0000
Co-60	2.034E-05	0.0000	2.058E-12	0.0000	0.000E+00	0.0000	6.503E-07	0.0000	1.074E-07	0.0000	3.839E-08	0.0000	1.231E-09	0.0000
Cs-137	6.162E-02	0.0368	4.344E-09	0.0000	0.000E+00	0.0000	8.765E-03	0.0052	3.094E-03	0.0018	2.628E-03	0.0016	3.317E-05	0.0000
Eu-152	1.806E-03	0.0011	4.265E-10	0.0000	0.000E+00	0.0000	1.006E-06	0.0000	2.344E-07	0.0000	5.536E-09	0.0000	6.093E-08	0.0000
Eu-154	1.553E-04	0.0001	4.323E-11	0.0000	0.000E+00	0.0000	1.161E-07	0.0000	2.706E-08	0.0000	6.391E-10	0.0000	7.033E-09	0.0000
Fe-55	0.000E+00	0.0000	2.379E-20	0.0000	0.000E+00	0.0000	1.729E-16	0.0000	9.825E-16	0.0000	3.398E-17	0.0000	2.616E-17	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	1.492E-06	0.0000	1.423E-10	0.0000	0.000E+00	0.0000	1.455E-04	0.0001	1.912E-05	0.0000	7.761E-05	0.0000	1.099E-06	0.0000
Nb-94	1.049E-01	0.0626	3.382E-08	0.0000	0.000E+00	0.0000	1.875E-04	0.0001	1.840E-09	0.0000	3.189E-08	0.0000	2.841E-06	0.0000
Ni-59	0.000E+00	0.0000	1.976E-09	0.0000	0.000E+00	0.0000	2.471E-04	0.0001	1.278E-05	0.0000	1.693E-04	0.0001	7.485E-07	0.0000
Ni-63	0.000E+00	0.0000	6.768E-08	0.0000	0.000E+00	0.0000	9.983E-03	0.0060	5.166E-04	0.0003	6.842E-03	0.0041	3.025E-05	0.0000
Pu-238	1.116E-06	0.0000	2.027E-05	0.0000	0.000E+00	0.0000	5.328E-03	0.0032	1.513E-04	0.0001	3.571E-06	0.0000	8.061E-04	0.0005
Pu-239	2.310E-06	0.0000	2.446E-05	0.0000	0.000E+00	0.0000	6.500E-03	0.0039	1.846E-04	0.0001	4.258E-06	0.0000	9.835E-04	0.0006
[illegible]241	1.563E-04	0.0001	1.159E-05	0.0000	0.000E+00	0.0000	3.061E-03	0.0018	4.369E-05	0.0000	3.998E-06	0.0000	4.628E-04	0.0003
[illegible]	1.888E-05	0.0000	7.531E-09	0.0000	0.000E+00	0.0000	8.498E-03	0.0051	3.888E-04	0.0002	4.042E-04	0.0002	4.285E-06	0.0000
[illegible]	1.999E-07	0.0000	9.681E-11	0.0000	0.000E+00	0.0000	2.731E-03	0.0016	1.320E-06	0.0000	5.944E-05	0.0000	8.267E-08	0.0000
U-234	2.225E-06	0.0000	3.506E-06	0.0000	0.000E+00	0.0000	6.050E-04	0.0004	2.393E-05	0.0000	9.964E-05	0.0001	3.661E-05	0.0000
Total	1.709E-01	0.1020	1.978E-04	0.0001	0.000E+00	0.0000	8.245E-02	0.0492	4.950E-03	0.0030	1.034E-02	0.0062	7.865E-03	0.0047

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-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ag-108m	1.079E-31	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.357E-32	0.0000	0.000E+00	0.0000	2.238E-31	0.0000	3.953E-31	0.0000
Am-241	4.007E-01	0.2390	7.746E-04	0.0005	0.000E+00	0.0000	2.257E-01	0.1346	2.842E-04	0.0002	6.339E-05	0.0000	6.715E-01	0.4006
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cm-243	4.829E-03	0.0029	9.335E-06	0.0000	0.000E+00	0.0000	2.720E-03	0.0016	1.396E-06	0.0000	7.621E-07	0.0000	8.398E-03	0.0050
Co-60	2.339E-06	0.0000	4.522E-08	0.0000	0.000E+00	0.0000	1.340E-06	0.0000	6.643E-07	0.0000	3.706E-07	0.0000	2.590E-05	0.0000
Cs-137	1.610E-01	0.0960	2.076E-02	0.0124	0.000E+00	0.0000	9.149E-02	0.0546	6.869E-02	0.0410	1.021E-01	0.0609	5.202E-01	0.3103
Eu-152	4.989E-06	0.0000	1.607E-08	0.0000	0.000E+00	0.0000	2.811E-06	0.0000	1.413E-07	0.0000	7.891E-09	0.0000	1.816E-03	0.0011
Eu-154	5.759E-07	0.0000	1.855E-09	0.0000	0.000E+00	0.0000	3.244E-07	0.0000	1.631E-08	0.0000	9.109E-10	0.0000	1.563E-04	0.0001
Fe-55	6.468E-14	0.0000	8.338E-16	0.0000	0.000E+00	0.0000	3.644E-14	0.0000	1.835E-14	0.0000	1.536E-15	0.0000	1.231E-13	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	1.043E-02	0.0062	2.691E-05	0.0000	0.000E+00	0.0000	5.907E-03	0.0035	1.042E-03	0.0006	8.282E-03	0.0049	2.594E-02	0.0155
Nb-94	2.863E-04	0.0002	5.534E-06	0.0000	0.000E+00	0.0000	1.616E-04	0.0001	1.217E-09	0.0000	4.529E-08	0.0000	1.056E-01	0.0630
Ni-59	7.606E-04	0.0005	4.902E-06	0.0000	0.000E+00	0.0000	4.330E-04	0.0003	5.395E-05	0.0000	1.204E-03	0.0007	2.887E-03	0.0017
Ni-63	3.074E-02	0.0183	1.981E-04	0.0001	0.000E+00	0.0000	1.750E-02	0.0104	2.180E-03	0.0013	4.867E-02	0.0290	1.167E-01	0.0696
Pu-238	1.626E-02	0.0097	3.143E-05	0.0000	0.000E+00	0.0000	9.158E-03	0.0055	2.304E-05	0.0000	1.506E-06	0.0000	3.178E-02	0.0190
Pu-239	1.983E-02	0.0118	3.834E-05	0.0000	0.000E+00	0.0000	1.117E-02	0.0067	2.809E-05	0.0000	1.568E-06	0.0000	3.877E-02	0.0231
[illegible]241	3.556E-02	0.0212	6.873E-05	0.0000	0.000E+00	0.0000	2.003E-02	0.0119	2.524E-05	0.0000	5.621E-06	0.0000	5.942E-02	0.0354
[illegible]	3.742E-02	0.0223	1.448E-04	0.0001	0.000E+00	0.0000	2.247E-02	0.0134	4.290E-03	0.0026	5.963E-03	0.0036	7.960E-02	0.0475
Tc-99	4.968E-04	0.0003	6.406E-07	0.0000	0.000E+00	0.0000	5.858E-04	0.0003	7.707E-07	0.0000	4.228E-05	0.0000	3.918E-03	0.0023
U-234	5.645E-03	0.0034	3.703E-06	0.0000	0.000E+00	0.0000	3.181E-03	0.0019	2.722E-05	0.0000	2.679E-04	0.0002	9.896E-03	0.0059
Total	7.240E-01	0.4318	2.206E-02	0.0132	0.000E+00	0.0000	4.105E-01	0.2449	7.665E-02	0.0457	1.666E-01	0.0994	1.677E+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-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ag-108m	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Am-241	1.237E-03	0.0020	9.104E-05	0.0001	0.000E+00	0.0000	2.410E-02	0.0395	3.425E-04	0.0006	3.150E-05	0.0001	3.636E-03	0.0060
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cm-243	2.679E-06	0.0000	3.809E-08	0.0000	0.000E+00	0.0000	1.009E-05	0.0000	2.246E-07	0.0000	8.404E-09	0.0000	1.527E-06	0.0000
Co-60	9.064E-18	0.0000	9.169E-25	0.0000	0.000E+00	0.0000	2.898E-19	0.0000	4.785E-20	0.0000	1.711E-20	0.0000	5.487E-22	0.0000
Cs-137	2.581E-06	0.0000	1.819E-13	0.0000	0.000E+00	0.0000	3.671E-07	0.0000	1.296E-07	0.0000	1.100E-07	0.0000	1.389E-09	0.0000
Eu-152	5.014E-08	0.0000	1.184E-14	0.0000	0.000E+00	0.0000	2.792E-11	0.0000	6.506E-12	0.0000	1.537E-13	0.0000	1.691E-12	0.0000
Eu-154	2.039E-11	0.0000	5.677E-18	0.0000	0.000E+00	0.0000	1.525E-14	0.0000	3.553E-15	0.0000	8.393E-17	0.0000	9.236E-16	0.0000
Fe-55	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	3.492E-11	0.0000	3.329E-15	0.0000	0.000E+00	0.0000	3.404E-09	0.0000	4.475E-10	0.0000	1.816E-09	0.0000	2.572E-11	0.0000
Nb-94	9.303E-02	0.1526	2.998E-08	0.0000	0.000E+00	0.0000	1.663E-04	0.0003	1.632E-09	0.0000	2.827E-08	0.0000	2.519E-06	0.0000
Ni-59	0.000E+00	0.0000	6.278E-10	0.0000	0.000E+00	0.0000	7.852E-05	0.0001	4.063E-06	0.0000	5.382E-05	0.0001	2.379E-07	0.0000
Ni-63	0.000E+00	0.0000	5.085E-09	0.0000	0.000E+00	0.0000	7.501E-04	0.0012	3.881E-05	0.0001	5.141E-04	0.0008	2.272E-06	0.0000
Pu-238	2.300E-07	0.0000	4.085E-06	0.0000	0.000E+00	0.0000	1.073E-03	0.0018	3.049E-05	0.0001	8.204E-07	0.0000	1.623E-04	0.0003
Pu-239	2.246E-06	0.0000	2.378E-05	0.0000	0.000E+00	0.0000	6.317E-03	0.0104	1.794E-04	0.0003	4.139E-06	0.0000	9.559E-04	0.0016
[illegible]241	1.056E-04	0.0002	7.774E-06	0.0000	0.000E+00	0.0000	2.057E-03	0.0034	2.923E-05	0.0000	2.690E-06	0.0000	3.105E-04	0.0005
[illegible]	8.852E-12	0.0000	3.530E-15	0.0000	0.000E+00	0.0000	3.983E-09	0.0000	1.823E-10	0.0000	1.894E-10	0.0000	2.008E-12	0.0000
Tc-99	2.318E-10	0.0000	1.123E-13	0.0000	0.000E+00	0.0000	3.167E-06	0.0000	1.530E-09	0.0000	6.893E-08	0.0000	9.586E-11	0.0000
U-234	6.487E-06	0.0000	2.960E-06	0.0000	0.000E+00	0.0000	5.202E-04	0.0009	2.034E-05	0.0000	8.403E-05	0.0001	3.098E-05	0.0001
Total	9.439E-02	0.1549	1.297E-04	0.0002	0.000E+00	0.0000	3.507E-02	0.0575	6.451E-04	0.0011	6.913E-04	0.0011	5.102E-03	0.0084

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-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ag-108m	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Am-241	2.492E-01	0.4089	4.818E-04	0.0008	0.000E+00	0.0000	1.404E-01	0.2303	1.773E-04	0.0003	3.944E-05	0.0001	4.197E-01	0.6887
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cm-243	5.430E-05	0.0001	1.050E-07	0.0000	0.000E+00	0.0000	3.058E-05	0.0001	4.027E-08	0.0000	6.894E-09	0.0000	9.961E-05	0.0002
Co-60	9.705E-19	0.0000	1.876E-20	0.0000	0.000E+00	0.0000	5.561E-19	0.0000	2.756E-19	0.0000	1.538E-19	0.0000	1.139E-17	0.0000
Cs-137	6.277E-06	0.0000	8.093E-07	0.0000	0.000E+00	0.0000	3.568E-06	0.0000	2.678E-06	0.0000	3.981E-06	0.0000	2.050E-05	0.0000
Eu-152	1.289E-10	0.0000	4.154E-13	0.0000	0.000E+00	0.0000	7.264E-11	0.0000	3.652E-12	0.0000	2.039E-13	0.0000	5.038E-08	0.0000
Eu-154	7.041E-14	0.0000	2.269E-16	0.0000	0.000E+00	0.0000	3.967E-14	0.0000	1.995E-15	0.0000	1.114E-16	0.0000	2.052E-11	0.0000
Fe-55	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	2.273E-07	0.0000	5.864E-10	0.0000	0.000E+00	0.0000	1.287E-07	0.0000	2.270E-08	0.0000	1.804E-07	0.0000	5.655E-07	0.0000
Nb-94	2.363E-04	0.0004	4.569E-06	0.0000	0.000E+00	0.0000	1.334E-04	0.0002	1.004E-09	0.0000	3.739E-08	0.0000	9.357E-02	0.1535
Ni-59	2.251E-04	0.0004	1.450E-06	0.0000	0.000E+00	0.0000	1.281E-04	0.0002	1.596E-05	0.0000	3.564E-04	0.0006	8.637E-04	0.0014
Ni-63	2.150E-03	0.0035	1.386E-05	0.0000	0.000E+00	0.0000	1.224E-03	0.0020	1.525E-04	0.0003	3.404E-03	0.0056	8.250E-03	0.0135
Pu-238	3.054E-03	0.0050	5.895E-06	0.0000	0.000E+00	0.0000	1.720E-03	0.0028	4.346E-06	0.0000	5.379E-07	0.0000	6.056E-03	0.0099
Pu-239	1.795E-02	0.0294	3.469E-05	0.0001	0.000E+00	0.0000	1.011E-02	0.0166	2.542E-05	0.0000	1.419E-06	0.0000	3.560E-02	0.0584
Pu-241	2.229E-02	0.0366	4.309E-05	0.0001	0.000E+00	0.0000	1.255E-02	0.0206	1.585E-05	0.0000	3.527E-06	0.0000	3.742E-02	0.0614
[illegible]	1.633E-08	0.0000	6.319E-11	0.0000	0.000E+00	0.0000	9.807E-09	0.0000	1.872E-09	0.0000	2.603E-09	0.0000	3.504E-08	0.0000
Tc-99	5.365E-07	0.0000	6.917E-10	0.0000	0.000E+00	0.0000	6.325E-07	0.0000	8.322E-10	0.0000	4.565E-08	0.0000	4.454E-06	0.0000
U-234	4.451E-03	0.0073	3.458E-06	0.0000	0.000E+00	0.0000	2.508E-03	0.0041	2.172E-05	0.0000	2.108E-04	0.0003	7.860E-03	0.0129
Total	2.996E-01	0.4916	5.897E-04	0.0010	0.000E+00	0.0000	1.688E-01	0.2769	4.159E-04	0.0007	4.021E-03	0.0066	6.095E-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-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ag-108m	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Am-241	3.052E-04	0.0017	2.218E-05	0.0001	0.000E+00	0.0000	5.944E-03	0.0339	8.483E-05	0.0005	7.690E-06	0.0000	8.858E-04	0.0051
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cm-243	2.384E-09	0.0000	2.510E-08	0.0000	0.000E+00	0.0000	6.668E-06	0.0000	1.893E-07	0.0000	4.369E-09	0.0000	1.009E-06	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	1.227E-21	0.0000	8.649E-29	0.0000	0.000E+00	0.0000	1.745E-22	0.0000	6.159E-23	0.0000	5.231E-23	0.0000	6.604E-25	0.0000
Eu-152	5.648E-24	0.0000	2.506E-18	0.0000	0.000E+00	0.0000	1.335E-16	0.0000	3.112E-17	0.0000	7.350E-19	0.0000	8.088E-18	0.0000
Eu-154	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Fe-55	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	2.165E-27	0.0000	2.064E-31	0.0000	0.000E+00	0.0000	2.110E-25	0.0000	2.774E-26	0.0000	1.126E-25	0.0000	1.595E-27	0.0000
Nb-94	6.105E-02	0.3484	1.968E-08	0.0000	0.000E+00	0.0000	1.091E-04	0.0006	1.071E-09	0.0000	1.855E-08	0.0000	1.653E-06	0.0000
Ni-59	0.000E+00	0.0000	1.136E-11	0.0000	0.000E+00	0.0000	1.421E-06	0.0000	7.353E-08	0.0000	9.739E-07	0.0000	4.305E-09	0.0000
Ni-63	0.000E+00	0.0000	5.912E-13	0.0000	0.000E+00	0.0000	8.720E-08	0.0000	4.512E-09	0.0000	5.976E-08	0.0000	2.642E-10	0.0000
Pu-238	3.535E-08	0.0000	1.755E-08	0.0000	0.000E+00	0.0000	4.455E-06	0.0000	1.307E-07	0.0000	7.727E-08	0.0000	6.224E-07	0.0000
Pu-239	2.035E-06	0.0000	2.152E-05	0.0001	0.000E+00	0.0000	5.718E-03	0.0326	1.624E-04	0.0009	3.746E-06	0.0000	8.652E-04	0.0049
Pu-241	2.605E-05	0.0001	1.894E-06	0.0000	0.000E+00	0.0000	5.073E-04	0.0029	7.238E-06	0.0000	6.566E-07	0.0000	7.564E-05	0.0004
[illegible]	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Tc-99	1.231E-20	0.0000	5.963E-24	0.0000	0.000E+00	0.0000	1.682E-16	0.0000	8.127E-20	0.0000	3.661E-18	0.0000	5.091E-21	0.0000
U-234	2.808E-05	0.0002	1.652E-06	0.0000	0.000E+00	0.0000	3.484E-04	0.0020	1.237E-05	0.0001	4.758E-05	0.0003	1.783E-05	0.0001
Total	6.141E-02	0.3505	4.731E-05	0.0003	0.000E+00	0.0000	1.264E-02	0.0721	2.672E-04	0.0015	6.081E-05	0.0003	1.848E-03	0.0105

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-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ag-108m	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Am-241	4.497E-02	0.2567	8.694E-05	0.0005	0.000E+00	0.0000	2.533E-02	0.1446	3.270E-05	0.0002	7.130E-06	0.0000	7.768E-02	0.4433
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cm-243	1.438E-05	0.0001	2.779E-08	0.0000	0.000E+00	0.0000	8.097E-06	0.0000	2.036E-08	0.0000	1.137E-09	0.0000	3.042E-05	0.0002
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	2.209E-21	0.0000	2.849E-22	0.0000	0.000E+00	0.0000	1.256E-21	0.0000	9.427E-22	0.0000	1.401E-21	0.0000	7.610E-21	0.0000
Eu-152	2.333E-16	0.0000	3.759E-19	0.0000	0.000E+00	0.0000	1.315E-16	0.0000	6.610E-18	0.0000	3.691E-19	0.0000	5.481E-16	0.0000
Eu-154	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Fe-55	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	1.043E-23	0.0000	2.691E-26	0.0000	0.000E+00	0.0000	5.907E-24	0.0000	1.042E-24	0.0000	8.282E-24	0.0000	2.605E-23	0.0000
Nb-94	1.148E-04	0.0007	2.220E-06	0.0000	0.000E+00	0.0000	6.480E-05	0.0004	4.880E-10	0.0000	1.817E-08	0.0000	6.134E-02	0.3501
Ni-59	3.016E-06	0.0000	1.943E-08	0.0000	0.000E+00	0.0000	1.717E-06	0.0000	2.139E-07	0.0000	4.775E-06	0.0000	1.221E-05	0.0001
Ni-63	1.851E-07	0.0000	1.193E-09	0.0000	0.000E+00	0.0000	1.054E-07	0.0000	1.313E-08	0.0000	2.930E-07	0.0000	7.495E-07	0.0000
Pu-238	1.131E-05	0.0001	2.110E-08	0.0000	0.000E+00	0.0000	6.369E-06	0.0000	2.786E-08	0.0000	1.427E-07	0.0000	2.321E-05	0.0001
Pu-239	1.203E-02	0.0686	2.325E-05	0.0001	0.000E+00	0.0000	6.773E-03	0.0387	1.703E-05	0.0001	9.514E-07	0.0000	2.561E-02	0.1462
Pu-241	4.022E-03	0.0230	7.774E-06	0.0000	0.000E+00	0.0000	2.265E-03	0.0129	2.921E-06	0.0000	6.375E-07	0.0000	6.917E-03	0.0395
[illegible]	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
[illegible]	2.109E-17	0.0000	2.720E-20	0.0000	0.000E+00	0.0000	2.487E-17	0.0000	3.272E-20	0.0000	1.795E-18	0.0000	2.198E-16	0.0000
U-234	1.945E-03	0.0111	3.845E-06	0.0000	0.000E+00	0.0000	1.096E-03	0.0063	1.059E-05	0.0001	9.032E-05	0.0005	3.601E-03	0.0206
Total	6.311E-02	0.3602	1.241E-04	0.0007	0.000E+00	0.0000	3.554E-02	0.2029	6.352E-05	0.0004	1.043E-04	0.0006	1.752E-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)	Branch Fraction*	DSR(j,t) (mrem/yr)/(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
Ag-108m	Ag-108m	1.000E+00	4.081E+01	2.021E+01	4.903E+00	3.447E-02	2.432E-08	7.176E-30	0.000E+00	0.000E+00
Am-241	Am-241	1.000E+00	6.524E+00	6.509E+00	6.479E+00	6.374E+00	6.083E+00	5.165E+00	3.227E+00	5.960E-01
Am-241	Np-237	1.000E+00	7.587E-06	1.465E-05	2.874E-05	7.737E-05	2.105E-04	6.140E-04	1.343E-03	1.557E-03
Am-241	U-233	1.000E+00	8.738E-12	2.107E-11	6.466E-11	4.106E-10	2.941E-09	2.579E-08	1.405E-07	3.040E-07
Am-241	Th-229	1.000E+00	2.372E-11	2.373E-11	2.376E-11	2.387E-11	2.478E-11	4.785E-11	4.566E-10	5.811E-09
Am-241	∑DSR(j)		6.524E+00	6.509E+00	6.479E+00	6.374E+00	6.084E+00	5.166E+00	3.229E+00	5.975E-01
C-14	C-14	1.000E+00	1.471E+00	1.689E-01	1.984E-03	3.318E-10	9.626E-30	0.000E+00	0.000E+00	0.000E+00
Cm-243	Cm-243	9.976E-01	5.115E+00	4.988E+00	4.744E+00	3.980E+00	2.410E+00	4.162E-01	2.747E-03	6.170E-11
Cm-243	Pu-239	9.976E-01	8.456E-05	1.412E-04	2.497E-04	5.888E-04	1.280E-03	2.116E-03	2.115E-03	1.521E-03
Cm-243	U-235	9.976E-01	3.224E-14	9.602E-14	3.327E-13	2.209E-12	1.456E-11	9.419E-11	3.316E-10	7.154E-10
Cm-243	Pa-231	9.976E-01	2.628E-14	2.597E-14	2.627E-14	4.641E-14	4.584E-13	9.470E-12	9.220E-11	3.885E-10
Cm-243	Ac-227	9.976E-01	3.519E-14	3.454E-14	3.342E-14	3.600E-14	3.062E-13	1.345E-11	1.909E-10	8.951E-10
Cm-243	∑DSR(j)		5.115E+00	4.989E+00	4.745E+00	3.981E+00	2.411E+00	4.183E-01	4.863E-03	1.521E-03
Cm-243	Cm-243	2.400E-03	1.231E-02	1.200E-02	1.141E-02	9.576E-03	5.798E-03	1.001E-03	6.609E-06	1.484E-13
Cm-243	Am-243	2.400E-03	4.368E-05	7.276E-05	1.280E-04	2.926E-04	5.738E-04	6.033E-04	1.113E-04	1.325E-07
Cm-243	Pu-239	2.400E-03	8.444E-11	1.579E-10	3.339E-10	1.243E-09	5.576E-09	2.495E-08	4.754E-08	3.791E-08
Cm-243	U-235	2.400E-03	9.295E-19	1.182E-18	1.728E-18	4.911E-18	3.932E-17	6.739E-16	5.235E-15	1.630E-14
Cm-243	Pa-231	2.400E-03	1.425E-16	1.794E-16	2.496E-16	4.596E-16	8.119E-16	9.069E-16	1.343E-15	8.446E-15
Cm-243	Ac-227	2.400E-03	1.909E-16	2.403E-16	3.341E-16	6.149E-16	1.085E-15	1.209E-15	2.551E-15	1.935E-14
Cm-243	∑DSR(j)		1.235E-02	1.207E-02	1.154E-02	9.868E-03	6.372E-03	1.605E-03	1.179E-04	1.704E-07
Co-60	Co-60	1.000E+00	7.479E+00	6.487E+00	4.881E+00	1.803E+00	1.048E-01	4.961E-06	2.183E-18	0.000E+00
Cs-137	Cs-137	1.000E+00	1.109E+01	1.054E+01	9.527E+00	6.681E+00	2.424E+00	6.973E-02	2.748E-06	1.020E-21
Eu-152	Eu-152	7.208E-01	1.911E+00	1.813E+00	1.633E+00	1.131E+00	3.961E-01	1.007E-02	2.793E-07	3.143E-23
Eu-152	Eu-152	2.792E-01	7.402E-01	7.024E-01	6.324E-01	4.381E-01	1.534E-01	3.899E-03	1.082E-07	1.218E-23
Eu-152	Gd-152	2.792E-01	4.646E-16	8.007E-16	1.421E-15	3.136E-15	5.608E-15	6.701E-15	6.105E-15	4.216E-15
Eu-152	∑DSR(j)		7.402E-01	7.024E-01	6.324E-01	4.381E-01	1.534E-01	3.899E-03	1.082E-07	4.216E-15
Eu-154	Eu-154	1.000E+00	2.877E+00	2.658E+00	2.268E+00	1.303E+00	2.671E-01	1.042E-03	1.368E-10	1.121E-34
Fe-55	Fe-55	1.000E+00	3.646E-02	2.781E-02	1.617E-02	2.427E-03	1.075E-05	6.215E-14	1.800E-37	0.000E+00
H-3	H-3	1.000E+00	7.005E-02	1.634E-02	8.749E-04	3.060E-08	4.984E-21	0.000E+00	0.000E+00	0.000E+00
I-129	I-129	1.000E+00	9.239E+01	8.759E+01	7.868E+01	5.405E+01	1.848E+01	4.323E-01	9.425E-06	4.341E-22
Nb-94	Nb-94	1.000E+00	3.738E+00	3.736E+00	3.731E+00	3.715E+00	3.671E+00	3.519E+00	3.119E+00	2.045E+00
Ni-59	Ni-59	1.000E+00	1.171E-02	1.164E-02	1.150E-02	1.103E-02	9.779E-03	6.415E-03	1.919E-03	2.714E-05

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

Parent (i)	Product (j)	Branch Fraction*	DSR(j,t) (mrem/yr)/(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
Ni-63	Ni-63	1.000E+00	3.207E-02	3.165E-02	3.082E-02	2.810E-02	2.156E-02	8.540E-03	6.040E-04	5.487E-08
Pu-238	Pu-238	1.000E+00	1.819E+00	1.804E+00	1.775E+00	1.675E+00	1.419E+00	7.944E-01	1.511E-01	4.400E-04
Pu-238	U-234	1.000E+00	4.345E-06	7.465E-06	1.363E-05	3.429E-05	8.616E-05	2.035E-04	2.746E-04	1.284E-04
Pu-238	Th-230	1.000E+00	6.055E-12	1.109E-11	2.609E-11	1.304E-10	8.354E-10	6.864E-09	3.688E-08	1.281E-07
Pu-238	Ra-226	1.000E+00	3.973E-12	4.497E-12	7.536E-12	6.557E-11	1.248E-09	3.439E-08	5.140E-07	3.788E-06
Pu-238	Pb-210	1.000E+00	2.087E-11	2.182E-11	2.398E-11	4.397E-11	7.202E-10	4.226E-08	9.724E-07	7.859E-06
Pu-238	∑DSR(j)		1.819E+00	1.804E+00	1.775E+00	1.675E+00	1.419E+00	7.946E-01	1.514E-01	5.802E-04
Pu-239	Pu-239	1.000E+00	2.021E+00	2.020E+00	2.018E+00	2.012E+00	1.996E+00	1.938E+00	1.780E+00	1.281E+00
Pu-239	U-235	1.000E+00	1.568E-09	2.890E-09	5.533E-09	1.472E-08	4.044E-08	1.245E-07	3.191E-07	6.216E-07
Pu-239	Pa-231	1.000E+00	9.303E-12	1.618E-11	4.086E-11	2.393E-10	1.715E-09	1.568E-08	9.689E-08	3.404E-07
Pu-239	Ac-227	1.000E+00	7.561E-12	8.244E-12	1.253E-11	8.788E-11	1.354E-09	2.457E-08	2.046E-07	7.842E-07
Pu-239	∑DSR(j)		2.021E+00	2.020E+00	2.018E+00	2.012E+00	1.996E+00	1.938E+00	1.780E+00	1.281E+00
Pu-241	Pu-241	1.000E+00	3.818E-02	3.637E-02	3.301E-02	2.350E-02	8.906E-03	2.982E-04	1.816E-08	3.101E-23
Pu-241	Am-241	1.000E+00	1.477E-02	2.471E-02	4.315E-02	9.455E-02	1.688E-01	1.854E-01	1.169E-01	2.156E-02
Pu-241	Np-237	1.000E+00	8.501E-09	2.615E-08	9.254E-08	6.002E-07	3.507E-06	1.707E-05	4.380E-05	5.319E-05
Pu-241	U-233	1.000E+00	3.088E-14	5.313E-14	1.798E-13	2.346E-12	3.736E-11	6.219E-10	4.422E-09	1.052E-08
Pu-241	Th-229	1.000E+00	2.665E-13	2.927E-13	3.416E-13	4.805E-13	7.020E-13	1.308E-12	1.299E-11	1.867E-10
Pu-241	∑DSR(j)		5.295E-02	6.108E-02	7.616E-02	1.181E-01	1.777E-01	1.857E-01	1.169E-01	2.162E-02
Pu-241	Pu-241	2.450E-05	9.354E-07	8.911E-07	8.087E-07	5.758E-07	2.182E-07	7.307E-09	4.448E-13	7.597E-28
Pu-241	Np-237	2.450E-05	1.846E-10	3.501E-10	6.583E-10	1.525E-09	2.826E-09	3.407E-09	2.854E-09	1.468E-09
Pu-241	U-233	2.450E-05	1.734E-16	4.754E-16	1.506E-15	8.854E-15	4.901E-14	2.218E-13	4.789E-13	3.628E-13
Pu-241	Th-229	2.450E-05	7.513E-18	8.821E-18	1.131E-17	1.916E-17	4.356E-17	2.767E-16	2.072E-15	1.075E-14
Pu-241	∑DSR(j)		9.356E-07	8.914E-07	8.093E-07	5.773E-07	2.210E-07	1.071E-08	2.855E-09	1.468E-09
Sr-90	Sr-90	1.000E+00	3.980E+01	3.700E+01	3.196E+01	1.915E+01	4.433E+00	2.645E-02	1.164E-08	6.343E-31
Tc-99	Tc-99	1.000E+00	9.682E-01	9.361E-01	8.747E-01	6.900E-01	3.503E-01	3.265E-02	3.712E-05	1.831E-15
U-234	U-234	1.000E+00	1.113E+00	1.112E+00	1.109E+00	1.100E+00	1.074E+00	9.885E-01	7.774E-01	3.216E-01
U-234	Th-230	1.000E+00	1.427E-06	2.074E-06	3.305E-06	7.593E-06	1.969E-05	6.025E-05	1.622E-04	3.963E-04
U-234	Ra-226	1.000E+00	1.430E-07	2.925E-07	8.765E-07	5.866E-06	4.428E-05	4.213E-04	2.799E-03	1.236E-02
U-234	Pb-210	1.000E+00	4.005E-07	4.147E-07	5.033E-07	2.113E-06	3.040E-05	5.991E-04	5.587E-03	2.578E-02
U-234	∑DSR(j)		1.113E+00	1.112E+00	1.109E+00	1.100E+00	1.074E+00	9.896E-01	7.860E-01	3.601E-01

*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
The DSR includes contributions from associated (half-life ≤ 0.5 yr) 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
Ag-108m	6.126E-01	1.237E+00	5.099E+00	7.252E+02	1.028E+09	*2.608E+13	*2.608E+13	*2.608E+13
Am-241	3.832E+00	3.841E+00	3.859E+00	3.922E+00	4.109E+00	4.840E+00	7.743E+00	4.184E+01
C-14	1.700E+01	1.480E+02	1.260E+04	7.535E+10	*4.454E+12	*4.454E+12	*4.454E+12	*4.454E+12
Cm-243	4.876E+00	4.999E+00	5.256E+00	6.264E+00	1.034E+01	5.954E+01	5.020E+03	1.644E+04
Co-60	3.343E+00	3.854E+00	5.122E+00	1.386E+01	2.385E+02	5.039E+06	*1.131E+15	*1.131E+15
Cs-137	2.254E+00	2.371E+00	2.624E+00	3.742E+00	1.031E+01	3.585E+02	9.096E+06	*8.701E+13
Eu-152	9.429E+00	9.937E+00	1.104E+01	1.593E+01	4.550E+01	1.790E+03	6.451E+07	*1.765E+14
Eu-154	8.691E+00	9.407E+00	1.102E+01	1.919E+01	9.361E+01	2.399E+04	1.827E+11	*2.639E+14
Fe-55	6.857E+02	8.990E+02	1.546E+03	1.030E+04	2.326E+06	4.022E+14	*2.409E+15	*2.409E+15
H-3	3.569E+02	1.530E+03	2.858E+04	8.171E+08	*9.594E+15	*9.594E+15	*9.594E+15	*9.594E+15
I-129	2.706E-01	2.854E-01	3.178E-01	4.626E-01	1.353E+00	5.783E+01	2.653E+06	*1.766E+08
Nb-94	6.688E+00	6.692E+00	6.701E+00	6.729E+00	6.811E+00	7.104E+00	8.015E+00	1.223E+01
Ni-59	2.134E+03	2.147E+03	2.173E+03	2.267E+03	2.556E+03	3.897E+03	1.303E+04	9.211E+05
Ni-63	7.796E+02	7.899E+02	8.111E+02	8.898E+02	1.159E+03	2.928E+03	4.139E+04	4.556E+08
Pu-238	1.374E+01	1.386E+01	1.409E+01	1.493E+01	1.762E+01	3.146E+01	1.651E+02	4.309E+04
Pu-239	1.237E+01	1.238E+01	1.239E+01	1.242E+01	1.253E+01	1.290E+01	1.405E+01	1.952E+01
Pu-241	4.722E+02	4.093E+02	3.283E+02	2.118E+02	1.407E+02	1.346E+02	2.138E+02	1.157E+03
Sr-90	6.282E-01	6.757E-01	7.822E-01	1.305E+00	5.639E+00	9.453E+02	2.147E+09	*1.365E+14
Tc-99	2.582E+01	2.671E+01	2.858E+01	3.623E+01	7.137E+01	7.656E+02	6.736E+05	*1.696E+10
U-234	2.246E+01	2.249E+01	2.254E+01	2.273E+01	2.327E+01	2.526E+01	3.181E+01	6.942E+01

*Exceeds 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)
Ag-108m	6.000E-02	0.000E+00	4.081E+01	6.126E-01	4.081E+01	6.126E-01
Am-241	1.300E-01	0.000E+00	6.524E+00	3.832E+00	6.524E+00	3.832E+00
C-14	5.800E-01	0.000E+00	1.471E+00	1.700E+01	1.471E+00	1.700E+01
Cm-243	2.000E-02	0.000E+00	5.128E+00	4.876E+00	5.128E+00	4.876E+00
Co-60	5.220E+00	0.000E+00	7.479E+00	3.343E+00	7.479E+00	3.343E+00
Cs-137	7.460E+00	0.000E+00	1.109E+01	2.254E+00	1.109E+01	2.254E+00
Eu-152	1.300E-01	0.000E+00	2.651E+00	9.429E+00	2.651E+00	9.429E+00
Eu-154	1.500E-01	0.000E+00	2.877E+00	8.691E+00	2.877E+00	8.691E+00
Fe-55	1.980E+00	0.000E+00	3.646E-02	6.857E+02	3.646E-02	6.857E+02
H-3	6.653E+01	0.000E+00	7.005E-02	3.569E+02	7.005E-02	3.569E+02
I-129	6.000E-02	0.000E+00	9.239E+01	2.706E-01	9.239E+01	2.706E-01
Nb-94	3.000E-02	0.000E+00	3.738E+00	6.688E+00	3.738E+00	6.688E+00
Ni-59	4.500E-01	0.000E+00	1.171E-02	2.134E+03	1.171E-02	2.134E+03
Ni-63	1.366E+01	0.000E+00	3.207E-02	7.796E+02	3.207E-02	7.796E+02
Pu-238	4.000E-02	0.000E+00	1.819E+00	1.374E+01	1.819E+00	1.374E+01
Pu-239	2.000E-02	0.000E+00	2.021E+00	1.237E+01	2.021E+00	1.237E+01
Pu-241	3.200E-01	60.1 ± 0.1	1.955E-01	1.279E+02	5.295E-02	4.722E+02
Sr-90	3.010E+00	0.000E+00	3.980E+01	6.282E-01	3.980E+01	6.282E-01
[illegible]	1.200E-01	0.000E+00	9.682E-01	2.582E+01	9.682E-01	2.582E+01
[illegible]	1.000E-02	0.000E+00	1.113E+00	2.246E+01	1.113E+00	2.246E+01

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

Nuclide (j)	Parent (i)	BRF(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
Ag-108m	Ag-108m	1.000E+00	2.448E+00	1.213E+00	2.942E-01	2.068E-03	1.459E-09	3.953E-31	0.000E+00	0.000E+00
Am-241	Am-241	1.000E+00	8.481E-01	8.462E-01	8.422E-01	8.286E-01	7.908E-01	6.715E-01	4.196E-01	7.748E-02
Am-241	Pu-241	1.000E+00	4.726E-03	7.908E-03	1.381E-02	3.026E-02	5.400E-02	5.932E-02	3.740E-02	6.900E-03
Am-241	∑DOSE(j)		8.529E-01	8.541E-01	8.560E-01	8.589E-01	8.448E-01	7.308E-01	4.570E-01	8.438E-02
Np-237	Am-241	1.000E+00	9.863E-07	1.904E-06	3.736E-06	1.006E-05	2.737E-05	7.982E-05	1.746E-04	2.024E-04
Np-237	Pu-241	1.000E+00	2.720E-09	8.368E-09	2.961E-08	1.921E-07	1.122E-06	5.462E-06	1.401E-05	1.702E-05
Np-237	Pu-241	2.450E-05	5.906E-11	1.120E-10	2.107E-10	4.880E-10	9.045E-10	1.090E-09	9.132E-10	4.697E-10
Np-237	∑DOSE(j)		9.891E-07	1.913E-06	3.766E-06	1.025E-05	2.849E-05	8.529E-05	1.886E-04	2.194E-04
U-233	Am-241	1.000E+00	1.136E-12	2.739E-12	8.406E-12	5.338E-11	3.824E-10	3.352E-09	1.827E-08	3.953E-08
U-233	Pu-241	1.000E+00	9.881E-15	1.700E-14	5.753E-14	7.508E-13	1.196E-11	1.990E-10	1.415E-09	3.366E-09
U-233	Pu-241	2.450E-05	5.548E-17	1.521E-16	4.819E-16	2.833E-15	1.568E-14	7.099E-14	1.532E-13	1.161E-13
U-233	∑DOSE(j)		1.146E-12	2.756E-12	8.464E-12	5.414E-11	3.943E-10	3.551E-09	1.968E-08	4.289E-08
Th-229	Am-241	1.000E+00	3.084E-12	3.085E-12	3.088E-12	3.104E-12	3.221E-12	6.221E-12	5.936E-11	7.555E-10
Th-229	Pu-241	1.000E+00	8.529E-14	9.368E-14	1.093E-13	1.538E-13	2.246E-13	4.187E-13	4.157E-12	5.975E-11
Th-229	Pu-241	2.450E-05	2.404E-18	2.823E-18	3.618E-18	6.131E-18	1.394E-17	8.853E-17	6.631E-16	3.440E-15
Th-229	∑DOSE(j)		3.169E-12	3.179E-12	3.198E-12	3.257E-12	3.446E-12	6.640E-12	6.352E-11	8.152E-10
C	C-14	1.000E+00	8.530E-01	9.799E-02	1.151E-03	1.924E-10	5.528E-30	0.000E+00	0.000E+00	0.000E+00
Cm-243	Cm-243	9.976E-01	1.023E-01	9.977E-02	9.489E-02	7.961E-02	4.820E-02	8.324E-03	5.494E-05	1.234E-12
Cm-243	Cm-243	2.400E-03	2.461E-04	2.400E-04	2.283E-04	1.915E-04	1.160E-04	2.002E-05	1.322E-07	2.969E-15
Cm-243	∑DOSE(j)		1.025E-01	1.000E-01	9.511E-02	7.980E-02	4.832E-02	8.344E-03	5.508E-05	1.237E-12
Pu-239	Cm-243	9.976E-01	1.691E-06	2.823E-06	4.994E-06	1.178E-05	2.561E-05	4.233E-05	4.231E-05	3.042E-05
Pu-239	Cm-243	2.400E-03	1.689E-12	3.157E-12	6.677E-12	2.486E-11	1.115E-10	4.989E-10	9.507E-10	7.583E-10
Pu-239	Pu-239	1.000E+00	4.041E-02	4.040E-02	4.036E-02	4.025E-02	3.991E-02	3.877E-02	3.560E-02	2.561E-02
Pu-239	∑DOSE(j)		4.041E-02	4.040E-02	4.037E-02	4.026E-02	3.994E-02	3.881E-02	3.564E-02	2.564E-02
U-235	Cm-243	9.976E-01	6.447E-16	1.920E-15	6.653E-15	4.418E-14	2.911E-13	1.884E-12	6.633E-12	1.431E-11
U-235	Cm-243	2.400E-03	1.859E-20	2.365E-20	3.455E-20	9.823E-20	7.864E-19	1.348E-17	1.047E-16	3.259E-16
U-235	Pu-239	1.000E+00	3.135E-11	5.780E-11	1.107E-10	2.944E-10	8.088E-10	2.491E-09	6.382E-09	1.243E-08
U-235	∑DOSE(j)		3.135E-11	5.780E-11	1.107E-10	2.944E-10	8.091E-10	2.493E-09	6.389E-09	1.245E-08
Pa-231	Cm-243	9.976E-01	5.256E-16	5.194E-16	5.255E-16	9.283E-16	9.168E-15	1.894E-13	1.844E-12	7.769E-12
Pa-231	Cm-243	2.400E-03	2.850E-18	3.589E-18	4.991E-18	9.191E-18	1.624E-17	1.814E-17	2.685E-17	1.689E-16
Pa-231	Pu-239	1.000E+00	1.861E-13	3.237E-13	8.172E-13	4.785E-12	3.430E-11	3.136E-10	1.938E-09	6.808E-09
Pa-231	∑DOSE(j)		1.866E-13	3.242E-13	8.177E-13	4.786E-12	3.431E-11	3.138E-10	1.940E-09	6.816E-09
Ac-227	Cm-243	9.976E-01	7.038E-16	6.908E-16	6.684E-16	7.200E-16	6.123E-15	2.689E-13	3.819E-12	1.790E-11
Ac-227	Cm-243	2.400E-03	3.817E-18	4.805E-18	6.681E-18	1.230E-17	2.171E-17	2.417E-17	5.103E-17	3.870E-16
Ac-227	Pu-239	1.000E+00	1.512E-13	1.649E-13	2.506E-13	1.758E-12	2.708E-11	4.913E-10	4.093E-09	1.568E-08
Ac-227	∑DOSE(j)		1.519E-13	1.656E-13	2.512E-13	1.758E-12	2.708E-11	4.916E-10	4.097E-09	1.570E-08
Am-243	Cm-243	2.400E-03	8.736E-07	1.455E-06	2.560E-06	5.853E-06	1.148E-05	1.207E-05	2.225E-06	2.651E-09

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

Nuclide (j)	Parent (i)	BRF(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
Co-60	Co-60	1.000E+00	3.904E+01	3.386E+01	2.548E+01	9.412E+00	5.471E-01	2.590E-05	1.139E-17	0.000E+00
Cs-137	Cs-137	1.000E+00	8.273E+01	7.866E+01	7.107E+01	4.984E+01	1.808E+01	5.202E-01	2.050E-05	7.610E-21
Eu-152	Eu-152	7.208E-01	2.484E-01	2.357E-01	2.123E-01	1.470E-01	5.149E-02	1.309E-03	3.631E-08	4.086E-24
Eu-152	Eu-152	2.792E-01	9.623E-02	9.131E-02	8.222E-02	5.695E-02	1.994E-02	5.069E-04	1.407E-08	1.583E-24
Eu-152	∑DOSE(j)		3.447E-01	3.270E-01	2.945E-01	2.040E-01	7.143E-02	1.816E-03	5.038E-08	5.669E-24
Gd-152	Eu-152	2.792E-01	6.040E-17	1.041E-16	1.847E-16	4.077E-16	7.290E-16	8.711E-16	7.937E-16	5.481E-16
Eu-154	Eu-154	1.000E+00	4.315E-01	3.986E-01	3.402E-01	1.954E-01	4.006E-02	1.563E-04	2.052E-11	0.000E+00
Fe-55	Fe-55	1.000E+00	7.219E-02	5.506E-02	3.202E-02	4.805E-03	2.128E-05	1.231E-13	0.000E+00	0.000E+00
H-3	H-3	1.000E+00	4.660E+00	1.087E+00	5.820E-02	2.036E-06	3.316E-19	0.000E+00	0.000E+00	0.000E+00
I-129	I-129	1.000E+00	5.543E+00	5.255E+00	4.721E+00	3.243E+00	1.109E+00	2.594E-02	5.655E-07	2.605E-23
Nb-94	Nb-94	1.000E+00	1.121E-01	1.121E-01	1.119E-01	1.115E-01	1.101E-01	1.056E-01	9.357E-02	6.134E-02
	Ni-59	1.000E+00	5.271E-03	5.240E-03	5.177E-03	4.964E-03	4.401E-03	2.887E-03	8.637E-04	1.221E-05
Ni-63	Ni-63	1.000E+00	4.381E-01	4.323E-01	4.210E-01	3.838E-01	2.946E-01	1.167E-01	8.250E-03	7.495E-07
Pu-238	Pu-238	1.000E+00	7.277E-02	7.217E-02	7.099E-02	6.699E-02	5.676E-02	3.178E-02	6.045E-03	1.760E-05
U-234	Pu-238	1.000E+00	1.738E-07	2.986E-07	5.450E-07	1.371E-06	3.446E-06	8.140E-06	1.098E-05	5.135E-06
U-234	U-234	1.000E+00	1.113E-02	1.112E-02	1.109E-02	1.100E-02	1.074E-02	9.885E-03	7.774E-03	3.216E-03
U-234	∑DOSE(j)		1.113E-02	1.112E-02	1.109E-02	1.100E-02	1.075E-02	9.893E-03	7.785E-03	3.221E-03
Th-230	Pu-238	1.000E+00	2.422E-13	4.436E-13	1.044E-12	5.216E-12	3.342E-11	2.746E-10	1.475E-09	5.124E-09
Th-230	U-234	1.000E+00	1.427E-08	2.074E-08	3.305E-08	7.593E-08	1.969E-07	6.025E-07	1.622E-06	3.963E-06
Th-230	∑DOSE(j)		1.427E-08	2.074E-08	3.305E-08	7.593E-08	1.969E-07	6.028E-07	1.624E-06	3.968E-06
Ra-226	Pu-238	1.000E+00	1.589E-13	1.799E-13	3.014E-13	2.623E-12	4.990E-11	1.376E-09	2.056E-08	1.515E-07
Ra-226	U-234	1.000E+00	1.430E-09	2.925E-09	8.765E-09	5.866E-08	4.428E-07	4.213E-06	2.799E-05	1.236E-04
Ra-226	∑DOSE(j)		1.430E-09	2.925E-09	8.765E-09	5.866E-08	4.428E-07	4.215E-06	2.801E-05	1.238E-04
Pb-210	Pu-238	1.000E+00	8.347E-13	8.727E-13	9.591E-13	1.759E-12	2.861E-11	1.690E-09	3.890E-08	3.144E-07
Pb-210	U-234	1.000E+00	4.005E-09	4.147E-09	5.033E-09	2.113E-08	3.040E-07	5.991E-06	5.587E-05	2.578E-04
Pb-210	∑DOSE(j)		4.006E-09	4.148E-09	5.034E-09	2.113E-08	3.040E-07	5.993E-06	5.591E-05	2.581E-04
Pu-241	Pu-241	1.000E+00	1.222E-02	1.164E-02	1.056E-02	7.521E-03	2.850E-03	9.543E-05	5.810E-09	9.922E-24
Pu-241	Pu-241	2.450E-05	2.993E-07	2.851E-07	2.588E-07	1.843E-07	6.982E-08	2.338E-09	1.424E-13	2.424E-28
Pu-241	∑DOSE(j)		1.222E-02	1.164E-02	1.056E-02	7.521E-03	2.850E-03	9.544E-05	5.810E-09	9.922E-24
	Sr-90	1.000E+00	1.198E+02	1.114E+02	9.620E+01	5.765E+01	1.334E+01	7.960E-02	3.504E-08	0.000E+00
Tc-99	Tc-99	1.000E+00	1.162E-01	1.123E-01	1.050E-01	8.280E-02	4.203E-02	3.918E-03	4.454E-06	2.198E-16

BRF(i) is the branch fraction of the parent nuclide.

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	BRF(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
Ag-108m	Ag-108m	1.000E+00	6.000E-02	2.956E-02	7.175E-03	5.056E-05	3.590E-11	1.083E-32	0.000E+00	0.000E+00
Am-241	Am-241	1.000E+00	1.300E-01	1.297E-01	1.292E-01	1.274E-01	1.224E-01	1.062E-01	7.095E-02	1.727E-02
Am-241	Pu-241	1.000E+00	0.000E+00	5.005E-04	1.429E-03	4.027E-03	7.838E-03	8.983E-03	6.059E-03	1.475E-03
Am-241	∑S(j):		1.300E-01	1.302E-01	1.306E-01	1.314E-01	1.302E-01	1.152E-01	7.701E-02	1.875E-02
Np-237	Am-241	1.000E+00	0.000E+00	4.205E-08	1.258E-07	4.154E-07	1.213E-06	3.675E-06	8.434E-06	1.150E-05
Np-237	Pu-241	1.000E+00	0.000E+00	8.172E-11	7.112E-10	7.054E-09	4.729E-08	2.440E-07	6.592E-07	9.450E-07
Np-237	Pu-241	2.450E-05	0.000E+00	2.478E-12	7.085E-12	2.007E-11	3.972E-11	4.930E-11	4.309E-11	2.609E-11
Np-237	∑S(j):		0.000E+00	4.213E-08	1.265E-07	4.224E-07	1.260E-06	3.919E-06	9.094E-06	1.244E-05
U-233	Am-241	1.000E+00	0.000E+00	9.187E-14	8.233E-13	9.013E-12	7.773E-11	7.449E-10	4.436E-09	1.295E-08
U-233	Pu-241	1.000E+00	0.000E+00	1.195E-16	3.141E-15	1.061E-13	2.244E-12	4.203E-11	3.282E-10	1.054E-09
U-233	Pu-241	2.450E-05	0.000E+00	5.456E-18	4.744E-17	4.686E-16	3.103E-15	1.524E-14	3.572E-14	3.641E-14
U-233	∑S(j):		0.000E+00	9.200E-14	8.265E-13	9.119E-12	7.998E-11	7.869E-10	4.764E-09	1.401E-08
Th-229	Am-241	1.000E+00	0.000E+00	2.893E-18	7.787E-17	2.851E-15	7.454E-14	2.468E-12	4.883E-11	6.778E-10
Th-229	Pu-241	1.000E+00	0.000E+00	2.829E-21	2.243E-19	2.571E-17	1.709E-15	1.199E-13	3.359E-12	5.350E-11
Th-229	Pu-241	2.450E-05	0.000E+00	1.725E-22	4.538E-21	1.538E-19	3.288E-18	6.415E-17	5.721E-16	3.091E-15
Th-229	∑S(j):		0.000E+00	2.896E-18	7.810E-17	2.877E-15	7.625E-14	2.587E-12	5.219E-11	7.313E-10
C	C-14	1.000E+00	5.800E-01	6.300E-02	7.400E-04	1.241E-10	3.626E-30	0.000E+00	0.000E+00	0.000E+00
Cm-243	Cm-243	9.976E-01	1.995E-02	1.946E-02	1.852E-02	1.557E-02	9.486E-03	1.674E-03	1.178E-05	3.445E-13
Cm-243	Cm-243	2.400E-03	4.800E-05	4.683E-05	4.456E-05	3.746E-05	2.282E-05	4.027E-06	2.834E-08	8.288E-16
Cm-243	∑S(j):		2.000E-02	1.951E-02	1.857E-02	1.561E-02	9.509E-03	1.678E-03	1.181E-05	3.454E-13
Pu-239	Cm-243	9.976E-01	0.000E+00	5.676E-07	1.661E-06	5.086E-06	1.213E-05	2.104E-05	2.233E-05	2.023E-05
Pu-239	Cm-243	2.400E-03	0.000E+00	6.419E-14	5.648E-13	5.802E-12	4.202E-11	2.353E-10	4.993E-10	5.042E-10
Pu-239	Pu-239	1.000E+00	2.000E-02	2.000E-02	1.999E-02	1.997E-02	1.991E-02	1.972E-02	1.916E-02	1.735E-02
Pu-239	∑S(j):		2.000E-02	2.000E-02	1.999E-02	1.998E-02	1.993E-02	1.974E-02	1.919E-02	1.737E-02
U-235	Cm-243	9.976E-01	0.000E+00	2.806E-16	2.482E-15	2.601E-14	1.996E-13	1.384E-12	5.193E-12	1.375E-11
U-235	Cm-243	2.400E-03	0.000E+00	2.113E-23	5.606E-22	1.955E-20	4.465E-19	9.722E-18	8.178E-17	3.132E-16
U-235	Pu-239	1.000E+00	0.000E+00	1.969E-11	5.900E-11	1.960E-10	5.820E-10	1.873E-09	5.087E-09	1.214E-08
U-235	∑S(j):		0.000E+00	1.969E-11	5.900E-11	1.960E-10	5.822E-10	1.874E-09	5.092E-09	1.215E-08
Pa-231	Cm-243	9.976E-01	0.000E+00	1.981E-21	5.271E-20	1.856E-18	4.358E-17	1.045E-15	1.116E-14	6.241E-14
Pa-231	Cm-243	2.400E-03	0.000E+00	1.119E-28	8.923E-27	1.044E-24	7.284E-23	5.537E-21	1.437E-19	1.356E-18
Pa-231	Pu-239	1.000E+00	0.000E+00	2.081E-16	1.867E-15	2.051E-14	1.790E-13	1.786E-12	1.202E-11	5.593E-11
Pa-231	∑S(j):		0.000E+00	2.081E-16	1.867E-15	2.052E-14	1.790E-13	1.787E-12	1.203E-11	5.599E-11
Ac-227	Cm-243	9.976E-01	0.000E+00	1.566E-23	1.234E-21	1.383E-19	8.594E-18	4.719E-16	7.439E-15	4.735E-14
Ac-227	Cm-243	2.400E-03	0.000E+00	7.084E-31	1.677E-28	6.296E-26	1.188E-23	2.194E-21	9.115E-20	1.023E-18
Ac-227	Pu-239	1.000E+00	0.000E+00	2.186E-18	5.771E-17	1.978E-15	4.345E-14	8.927E-13	8.182E-12	4.251E-11
Ac-227	∑S(j):		0.000E+00	2.186E-18	5.771E-17	1.979E-15	4.346E-14	8.932E-13	8.189E-12	4.256E-11
Am-243	Cm-243	2.400E-03	0.000E+00	4.432E-09	1.285E-08	3.808E-08	8.197E-08	9.100E-08	1.812E-08	2.910E-11

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	BRF(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
Co-60	Co-60	1.000E+00	5.220E+00	4.528E+00	3.407E+00	1.259E+00	7.329E-02	3.485E-06	1.553E-18	0.000E+00
Cs-137	Cs-137	1.000E+00	7.460E+00	7.093E+00	6.413E+00	4.506E+00	1.645E+00	4.828E-02	2.022E-06	9.611E-22
Eu-152	Eu-152	7.208E-01	9.370E-02	8.891E-02	8.006E-02	5.545E-02	1.942E-02	4.937E-04	1.370E-08	1.544E-24
Eu-152	Eu-152	2.792E-01	3.630E-02	3.444E-02	3.101E-02	2.148E-02	7.523E-03	1.912E-04	5.308E-09	5.979E-25
Eu-152	∑S(j):		1.300E-01	1.234E-01	1.111E-01	7.693E-02	2.694E-02	6.849E-04	1.901E-08	2.142E-24
Gd-152	Eu-152	2.792E-01	0.000E+00	2.269E-16	6.464E-16	1.810E-15	3.505E-15	4.337E-15	4.170E-15	3.565E-15
Eu-154	Eu-154	1.000E+00	1.500E-01	1.386E-01	1.183E-01	6.792E-02	1.393E-02	5.436E-05	7.139E-12	5.859E-36
Fe-55	Fe-55	1.000E+00	1.980E+00	1.511E+00	8.791E-01	1.322E-01	5.896E-04	3.490E-12	1.085E-35	0.000E+00
H-3	H-3	1.000E+00	6.653E+01	1.541E+01	8.261E-01	2.901E-05	4.781E-18	0.000E+00	0.000E+00	0.000E+00
I-129	I-129	1.000E+00	6.000E-02	5.688E-02	5.113E-02	3.521E-02	1.212E-02	2.902E-04	6.792E-09	4.211E-25
Nb-94	Nb-94	1.000E+00	3.000E-02	2.998E-02	2.995E-02	2.982E-02	2.946E-02	2.825E-02	2.505E-02	1.644E-02
	Ni-59	1.000E+00	4.500E-01	4.474E-01	4.423E-01	4.249E-01	3.789E-01	2.537E-01	8.062E-02	1.459E-03
Ni-63	Ni-63	1.000E+00	1.366E+01	1.348E+01	1.314E+01	1.200E+01	9.265E+00	3.744E+00	2.813E-01	3.270E-05
Pu-238	Pu-238	1.000E+00	4.000E-02	3.968E-02	3.905E-02	3.692E-02	3.145E-02	1.795E-02	3.614E-03	1.324E-05
U-234	Pu-238	1.000E+00	0.000E+00	1.129E-07	3.357E-07	1.085E-06	2.983E-06	7.427E-06	1.079E-05	6.630E-06
U-234	U-234	1.000E+00	1.000E-02	9.991E-03	9.974E-03	9.913E-03	9.742E-03	9.164E-03	7.697E-03	4.179E-03
U-234	∑S(j):		1.000E-02	9.991E-03	9.974E-03	9.914E-03	9.745E-03	9.172E-03	7.708E-03	4.185E-03
Th-230	Pu-238	1.000E+00	0.000E+00	5.089E-13	4.553E-12	4.956E-11	4.209E-10	3.853E-09	2.147E-08	7.707E-08
Th-230	U-234	1.000E+00	0.000E+00	8.998E-08	2.697E-07	8.962E-07	2.665E-06	8.615E-06	2.372E-05	5.964E-05
Th-230	∑S(j):		0.000E+00	8.998E-08	2.697E-07	8.963E-07	2.665E-06	8.619E-06	2.374E-05	5.972E-05
Ra-226	Pu-238	1.000E+00	0.000E+00	7.348E-17	1.972E-15	7.154E-14	1.821E-12	5.517E-11	8.791E-10	7.698E-09
Ra-226	U-234	1.000E+00	0.000E+00	1.947E-11	1.748E-10	1.924E-09	1.687E-08	1.713E-07	1.204E-06	6.306E-06
Ra-226	∑S(j):		0.000E+00	1.947E-11	1.748E-10	1.925E-09	1.688E-08	1.714E-07	1.205E-06	6.314E-06
Pb-210	Pu-238	1.000E+00	0.000E+00	5.676E-19	4.516E-17	5.242E-15	3.582E-13	2.600E-11	6.608E-10	6.982E-09
Pb-210	U-234	1.000E+00	0.000E+00	2.002E-13	5.307E-12	1.846E-10	4.204E-09	9.411E-08	9.582E-07	5.763E-06
Pb-210	∑S(j):		0.000E+00	2.002E-13	5.307E-12	1.846E-10	4.204E-09	9.413E-08	9.589E-07	5.770E-06
Pu-241	Pu-241	1.000E+00	3.200E-01	3.049E-01	2.769E-01	1.975E-01	7.525E-02	2.569E-03	1.655E-07	3.556E-22
Pu-241	Pu-241	2.450E-05	7.840E-06	7.471E-06	6.783E-06	4.839E-06	1.844E-06	6.294E-08	4.056E-12	8.712E-27
Pu-241	∑S(j):		3.200E-01	3.049E-01	2.769E-01	1.975E-01	7.525E-02	2.569E-03	1.655E-07	3.556E-22
	Sr-90	1.000E+00	3.010E+00	2.798E+00	2.419E+00	1.452E+00	3.382E-01	2.061E-03	9.660E-10	6.811E-32
Tc-99	Tc-99	1.000E+00	1.200E-01	1.160E-01	1.084E-01	8.559E-02	4.353E-02	4.086E-03	4.739E-06	2.517E-16

BRF(i) is the branch fraction of the parent nuclide.

RESCALC.EXE execution time = 35.74 seconds

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th HLSMEARMIX.bld

RESRAD-BUILD Table of Contents

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th HLSMEARMIX.bld

RESRAD-BUILD Input Parameters

Number of Sources : 6
Number of Receptors: 1
Total Time : 3.652500E+02 days
Fraction Inside : 2.670000E-01

Receptor Information

Receptor	Room	x (m)	y (m)	z (m)	FracTime	Inhalation (m3/day)	Ingestion(Dust) (m2/hr)
1	1	7.500	2.500	1.000	1.000	3.36E+01	0.00E+00

Receptor-Source Shielding Relationship

Receptor	Source	Density (g/cm3)	Thickness (cm)	Material
1	1	2.40E+00	0.00E+00	Concrete
1	2	2.40E+00	0.00E+00	Concrete
1	3	2.40E+00	0.00E+00	Concrete
1	4	2.40E+00	0.00E+00	Concrete
1	5	2.40E+00	0.00E+00	Concrete
1	6	2.40E+00	0.00E+00	Concrete

Title : Plumbrook Duplicate
Input file : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th HLSMEARMIX.bld

======== Building Information ========

Building Air Exchange Rate: 6.00E-01 1/hr

Height(m) / Area (m2)	Air Exchanges (m3/hr)	
		<=Q01: 1.80E+02
H1: 3.000	Room 1	Q10 : 1.80E+02
	LAMBDA: 8.00E-01	
Area 75.000		

Deposition velocity: 2.70E-06 (m/s) Resuspension Rate: 1.40E-05 (1/s)

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th HLSMEARMIX.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 0.00 y: 2.50 z: 1.50[m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration [pCi/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/(pCi/m3)]
FE-55	1.000E-10	6.070E-07	2.690E-06	0.000E+00

Source: 2
Location:: Room : 1 x: 15.00 y: 2.50 z: 1.50[m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration [pCi/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/(pCi/m3)]
FE-55	1.000E-10	6.070E-07	2.690E-06	0.000E+00

Source: 3

Location:: Room : 1 x: 7.50 y: 0.00 z: 1.50[m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
FE-55	1.000E-10	6.070E-07	2.690E-06	0.000E+00

Source: 4

Location:: Room : 1 x: 7.50 y: 5.00 z: 1.50[m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
FE-55	1.000E-10	6.070E-07	2.690E-06	0.000E+00

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th HLSMEARMIX.bld

Source: 5
Location:: Room : 1 x: 7.50 y: 2.50 z: 0.00[m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Radon Release Fraction: 0.000E+00

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
	[pCi/m2]	Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/ (pCi/m3)]
CM-243	1.300E-01	2.510E-03	3.070E-01	6.880E-04
PU-242	6.000E-02	3.360E-03	4.110E-01	4.690E-07
PU-241	1.190E+00	6.850E-05	8.250E-03	2.560E-08
AM-241	1.900E-01	3.640E-03	4.440E-01	9.570E-05
PU-239	1.300E-01	3.540E-03	4.290E-01	4.960E-07
PU-238	1.100E-01	3.200E-03	3.920E-01	5.710E-07
NP-237	0.000E+00	4.440E-03	5.400E-01	1.210E-03
U-238	0.000E+00	2.690E-04	1.180E-01	1.600E-04
U-235	0.000E+00	2.670E-04	1.230E-01	9.030E-04
U-234	3.000E-02	2.830E-04	1.320E-01	8.930E-07
U-233	0.000E+00	2.890E-04	1.350E-01	1.910E-06
PA-231	0.000E+00	1.060E-02	1.280E+00	2.010E-04
TH-230	0.000E+00	5.460E-04	3.260E-01	2.040E-06
TH-229	0.000E+00	4.030E-03	2.160E+00	1.720E-03
AC-227	0.000E+00	1.480E-02	6.720E+00	2.160E-03
RA-226	0.000E+00	1.330E-03	8.600E-03	1.040E-02
PB-210	0.000E+00	5.370E-03	1.380E-02	1.050E-05
TC-99	5.800E-01	1.460E-06	8.330E-06	1.900E-07
SR-90	2.540E+01	1.530E-04	1.310E-03	2.310E-05
NI-63	1.340E+01	5.770E-07	6.290E-06	0.000E+00
NI-59	3.300E-01	2.100E-07	2.700E-06	0.000E+00
FE-55	2.750E+00	6.070E-07	2.690E-06	0.000E+00

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th HLSMEARMIX.bld

Source: 6
Location:: Room : 1 x: 7.50 y: 2.50 z: 3.00[m]
Geometry:: Type: Area Area: 7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 6.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
FE-55	1.000E-10	6.070E-07	2.690E-06	0.000E+00

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th HLSMEARMIX.bld
Evaluation Time: 0.00000000E+00 years

==========
==========
=== Assessment for Time: 1 ===
=== Time =0.00E+00 yr ===
==========
==========

======== Source Information ========

Source: 1
Location:: Room : 1 x: 0.00 y: 2.50 z: 1.50 [m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	FE-55	1.000E-10

Source: 2
Location:: Room : 1 x: 15.00 y: 2.50 z: 1.50 [m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	FE-55	1.000E-10

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th HLSMEARMIX.bld
Calculation Time: 0.00000000E+00 years

Source: 3
Location:: Room : 1 x: 7.50 y: 0.00 z: 1.50 [m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	FE-55	1.000E-10

Source: 4
Location:: Room : 1 x: 7.50 y: 5.00 z: 1.50 [m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	FE-55	1.000E-10

Source: 5
Location:: Room : 1 x: 7.50 y: 2.50 z: 0.00 [m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	CM-243	1.300E-01
	PU-242	6.000E-02

Title : Plumbrook Duplicate

Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th HLSMEARMIX.bld

Calculation Time: 0.00000000E+00 years

PU-241	1.190E+00
AM-241	1.900E-01
PU-239	1.300E-01
PU-238	1.100E-01
NP-237	0.000E+00
U-238	0.000E+00
U-235	0.000E+00
U-234	3.000E-02
U-233	0.000E+00
PA-231	0.000E+00
TH-230	0.000E+00
TH-229	0.000E+00
AC-227	0.000E+00
RA-226	0.000E+00
PB-210	0.000E+00
TC-99	5.800E-01
SR-90	2.540E+01
NI-63	1.340E+01
NI-59	3.300E-01
FE-55	2.750E+00

Source: 6

Location:: Room : 1 x: 7.50 y: 2.50 z: 3.00 [m]

Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 4.070E-07 [1/hr]

Fraction released to air: 7.000E-02

Removable fraction: 1.000E-01

Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	FE-55	1.000E-10

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th HLSMEARMIX.bid
Duration Time: 0.00000000E+00 years

RESRAD-BUILDDose Tables

Source Contributions to Receptor Doses

(mrem)

	Source 1	Source 2	Source 3	Source 4	Source 5	Source 6	Total
Receptor 1	7.68E-20	7.68E-20	2.30E-19	2.30E-19	5.02E-05	3.84E-19	5.02E-05
Total	7.68E-20	7.68E-20	2.30E-19	2.30E-19	5.02E-05	3.84E-19	5.02E-05

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th HLSMEARMIX.bld
Duration Time: 0.00000000E+00 years

Pathway Detail of Doses

(mrem)

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	1.04E-21	0.00E+00	7.58E-20
Total	0.00E+00	0.00E+00	0.00E+00	1.04E-21	0.00E+00	7.58E-20

Source: 2

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	1.04E-21	0.00E+00	7.58E-20
Total	0.00E+00	0.00E+00	0.00E+00	1.04E-21	0.00E+00	7.58E-20

Source: 3

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	3.11E-21	0.00E+00	2.27E-19
Total	0.00E+00	0.00E+00	0.00E+00	3.11E-21	0.00E+00	2.27E-19

Source: 4

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	3.11E-21	0.00E+00	2.27E-19
Total	0.00E+00	0.00E+00	0.00E+00	3.11E-21	0.00E+00	2.27E-19

Source: 5

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.58E-06	2.03E-15	1.23E-12	6.43E-06	3.41E-23	4.22E-05
Total	1.58E-06	2.03E-15	1.23E-12	6.43E-06	3.41E-23	4.22E-05

Source: 6

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	5.19E-21	0.00E+00	3.79E-19
Total	0.00E+00	0.00E+00	0.00E+00	5.19E-21	0.00E+00	3.79E-19

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th HLSMEARMIX.bld
Evaluation Time: 0.00000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor 1	Total
FE-55		
FE-55	7.68E-20	7.68E-20

Source: 2

Nuclide	Receptor 1	Total
FE-55		
FE-55	7.68E-20	7.68E-20

Source: 3

Nuclide	Receptor 1	Total
FE-55		
FE-55	2.30E-19	2.30E-19

Source: 4

Nuclide	Receptor 1	Total
FE-55		
FE-55	2.30E-19	2.30E-19

Source: 5

Nuclide	Receptor 1	Total
CM-243		
CM-243	3.30E-06	3.30E-06
PU-239	6.39E-11	6.39E-11
U-235	3.81E-21	3.81E-21
PA-231	3.33E-25	3.33E-25
AC-227	5.24E-27	5.24E-27
PU-242		
PU-242	1.97E-06	1.97E-06
U-238	2.23E-17	2.23E-17
U-234	2.16E-23	2.16E-23
TH-230	1.09E-28	1.09E-28
RA-226	0.00E+00	0.00E+00
PB-210	0.00E+00	0.00E+00
PU-241		
PU-241	7.73E-07	7.73E-07
AM-241	3.36E-08	3.36E-08
NP-237	4.62E-15	4.62E-15
U-233	5.58E-22	5.58E-22
TH-229	1.67E-25	1.67E-25
AM-241	6.81E-06	6.81E-06
NP-237	1.40E-12	1.40E-12
U-233	2.24E-19	2.24E-19
TH-229	8.35E-23	8.35E-23
PU-239		
PU-239	4.48E-06	4.48E-06
U-235	3.99E-16	3.99E-16
PA-231	4.65E-20	4.65E-20
AC-227	9.10E-22	9.10E-22
PU-238		
PU-238	3.42E-06	3.42E-06
U-234	7.63E-13	7.63E-13
TH-230	5.14E-18	5.14E-18
RA-226	1.28E-21	1.28E-21
PB-210	1.20E-23	1.20E-23
U-234		
U-234	1.47E-07	1.47E-07
TH-230	1.49E-12	1.49E-12
RA-226	4.93E-16	4.93E-16
PB-210	5.74E-18	5.74E-18
TC-99		
TC-99	6.52E-09	6.52E-09
SR-90		
SR-90	2.92E-05	2.92E-05
NI-63	5.63E-08	5.63E-08
NI-59		
NI-59	5.10E-10	5.10E-10

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_family\BUILD\Plum Brook 25th HLSMEARMIX.bld
Evaluation Time: 0.00000000E+00 years

FE-55

FE-55	1.06E-08	1.06E-08

Source: 6

Nuclide	Receptor 1	Total
FE-55		
FE-55	3.84E-19	3.84E-19

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th HLSMEARMIX.bld
Summary

RESRAD-BUILD Dose (Time) Tables

Receptor Dose Received for the Exposure Duration

(mrem)

	Evaluation Time [yr] 0.00E+00
1	5.02E-05

Receptor Dose/Yr Averaged Over Exposure Duration

(mrem/yr)

	Evaluation Time [yr] 0.00E+00
1	5.02E-05

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th HLSMEARMIX.bld

RESRAD-BUILD Table of Contents

RESRAD-BUILD Input Parameters

Number of Sources : 6
Number of Receptors: 1
Total Time : 3.652500E+02 days
Fraction Inside : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	7.500	2.500	1.000	1.000	3.36E+01	0.00E+00

Receptor-Source Shielding Relationship

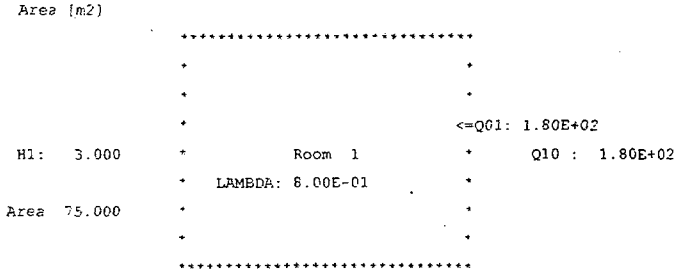
Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete
1	2	2.40E+00	0.00E+00	Concrete
1	3	2.40E+00	0.00E+00	Concrete
1	4	2.40E+00	0.00E+00	Concrete
1	5	2.40E+00	0.00E+00	Concrete
1	6	2.40E+00	0.00E+00	Concrete

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th HLSMEARMIX.bld

======== Building Information ========

Building Air Exchange Rate: 8.00E-01 1/hr

Height[m] Air Exchanges [m3/hr]
Area [m2]



Deposition velocity: 2.70E-06 [m/s] Resuspension Rate: 1.40E-05 [1/s]

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th HLSMEARMIX.bid

======== Source Information ========

Source: 1
Location:: Room : 1 x: 0.00 y: 2.50 z: 1.50[m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
EU-154	1.000E-10	9.550E-06	2.860E-04	7.180E-03

ce: 2
Location:: Room : 1 x: 15.00 y: 2.50 z: 1.50[m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
EU-154	1.000E-10	9.550E-06	2.860E-04	7.180E-03

Source: 3

Location:: Room : 1 x: 7.50 y: 0.00 z: 1.50[m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::

Nuclide	Concentration [pCi/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/(pCi/m3)]
EU-154	1.000E-10	9.550E-06	2.860E-04	7.180E-03

Source: 4

Location:: Room : 1 x: 7.50 y: 5.00 z: 1.50[m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::

Nuclide	Concentration [pCi/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/(pCi/m3)]
EU-154	1.000E-10	9.550E-06	2.860E-04	7.180E-03

Source: 5

Location:: Room : 1 x: 7.50 y: 2.50 z: 0.00[m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::

Nuclide	Concentration [pCi/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/(pCi/m3)]
EU-154	6.000E-02	9.550E-06	2.860E-04	7.180E-03
CS-137	4.370E+01	5.000E-05	3.190E-05	3.190E-03
CS-134	3.000E-02	7.330E-05	4.630E-05	8.860E-03
I-129	2.000E-02	2.760E-04	1.740E-04	4.450E-05
NB-94	1.200E-01	7.140E-06	4.140E-04	9.010E-03
CO-60	2.380E+00	2.690E-05	2.190E-04	1.470E-02
CO-57	3.000E-02	1.180E-06	9.070E-06	6.560E-04
NA-22	3.000E-02	1.150E-05	7.660E-06	1.260E-02
C-14	2.000E-01	2.090E-06	2.090E-06	2.620E-08

Source: 6

Location:: Room : 1 x: 7.50 y: 2.50 z: 3.00[m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::

Nuclide	Concentration [pCi/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/(pCi/m3)]

EU-154	1.000E-10	9.550E-06	2.860E-04	7.180E-03

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th HLSMEARMIX.bld
Evaluation Time: 0.00000000E+00 years

==========
==========
=== Assessment for Time: 1 ===
=== Time =0.00E+00 yr ===
==========
==========

======== Source Information ========

Source: 1
Location:: Room : 1 x: 0.00 y: 2.50 z: 1.50 [m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	EU-154	1.000E-10

Source: 2
Location:: Room : 1 x: 15.00 y: 2.50 z: 1.50 [m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	EU-154	1.000E-10

Duration Time: 0.00000000E+00 years

Source: 3

Location:: Room : 1 x: 7.50 y: 0.00 z: 1.50 [m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	EU-154	1.000E-10

Source: 4

Location:: Room : 1 x: 7.50 y: 5.00 z: 1.50 [m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	EU-154	1.000E-10

Source: 5

Location:: Room : 1 x: 7.50 y: 2.50 z: 0.00 [m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	EU-154	8.000E-02
	CS-137	4.370E+01

CS-134	3.000E-02
I-129	2.000E-02
NB-94	1.200E-01
CO-60	2.380E+00
CO-57	3.000E-02
NA-22	3.000E-02
C-14	2.000E-01

Source: 6

Location:: Room : 1 x: 7.50 y: 2.50 z: 3.00 [m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::

Nuclide	Concentration [pCi/m2]
EU-154	1.000E-10

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th HLSMEARMIX.bid
Evaluation Time: 0.00000000E+00 years

RESRAD-BUILDDose Tables

Source Contributions to Receptor Doses

[mrem]

	Source 1	Source 2	Source 3	Source 4	Source 5	Source 6	Total
Receptor 1	1.29E-16	1.29E-16	1.88E-15	1.88E-15	3.00E-04	3.09E-15	3.00E-04
Total	1.29E-16	1.29E-16	1.88E-15	1.88E-15	3.00E-04	3.09E-15	3.00E-04

Pathway Detail of Doses

(mrem)

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.28E-16	4.55E-25	8.52E-23	4.16E-20	0.00E+00	1.31E-18
Total	1.28E-16	4.55E-25	8.52E-23	4.16E-20	0.00E+00	1.31E-18

Source: 2

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.28E-16	4.55E-25	8.52E-23	4.16E-20	0.00E+00	1.31E-18
Total	1.28E-16	4.55E-25	8.52E-23	4.16E-20	0.00E+00	1.31E-18

Source: 3

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.88E-15	1.36E-24	2.56E-22	1.25E-19	0.00E+00	3.92E-18
Total	1.88E-15	1.36E-24	2.56E-22	1.25E-19	0.00E+00	3.92E-18

Source: 4

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.88E-15	1.36E-24	2.56E-22	1.25E-19	0.00E+00	3.92E-18
Total	1.88E-15	1.36E-24	2.56E-22	1.25E-19	0.00E+00	3.92E-18

Source: 5

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	2.84E-04	1.26E-13	1.07E-10	1.47E-08	0.00E+00	1.59E-05
Total	2.84E-04	1.26E-13	1.07E-10	1.47E-08	0.00E+00	1.59E-05

Source: 6

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	3.09E-15	2.27E-24	4.26E-22	2.08E-19	0.00E+00	6.54E-18
Total	3.09E-15	2.27E-24	4.26E-22	2.08E-19	0.00E+00	6.54E-18

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th HLSMEARMIX.bid
Calculation Time: 0.00000000E+00 years

Nuclide Detail of Doses
=======================
[mrem]

Source: 1

Nuclide	Receptor 1	Total
EU-154		
EU-154	1.29E-16	1.29E-16

Source: 2

Nuclide	Receptor 1	Total
EU-154		
EU-154	1.29E-16	1.29E-16

Source: 3

Nuclide	Receptor 1	Total
EU-154		
EU-154	1.88E-15	1.88E-15

Source: 4

Nuclide	Receptor 1	Total
EU-154		
EU-154	1.88E-15	1.88E-15

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th KLSMEARMIX.bld
Evaluation Time: 0.00000000E+00 years

Source: 5

Nuclide	Receptor 1	Total
EU-154		
EU-154	4.09E-06	4.09E-06
CS-137		
CS-137	2.43E-04	2.43E-04
CS-134		
CS-134	3.82E-07	3.82E-07
I-129		
I-129	4.87E-08	4.87E-08
NB-94		
NB-94	1.76E-06	1.76E-06
CO-60		
CO-60	4.98E-05	4.98E-05
CO-57		
CO-57	2.15E-08	2.15E-08
NA-22		
NA-22	5.31E-07	5.31E-07
C-14		
C-14	3.02E-09	3.02E-09

Source: 6

Nuclide	Receptor 1	Total
EU-154		
EU-154	3.09E-15	3.09E-15

Summary

RESRAD-BUILD Dose (Time) Tables

Receptor Dose Received for the Exposure Duration

(mrem)

	Evaluation Time [yr]
	0.00E+00
1	3.00E-04

Receptor Dose/Yr Averaged Over Exposure Duration

(mrem/yr)

	Evaluation Time [yr]
	0.00E+00
1	3.00E-04

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 HLSMEARMIX.bld

RESRAD-BUILD Table of Contents

RESRAD-BUILD Input Parameters

Number of Sources : 6
Number of Receptors: 1
Total Time : 3.652500E+02 days
Fraction Inside : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	7.500	2.500	1.000	1.000	3.36E+01	0.00E+00

Receptor-Source Shielding Relationship

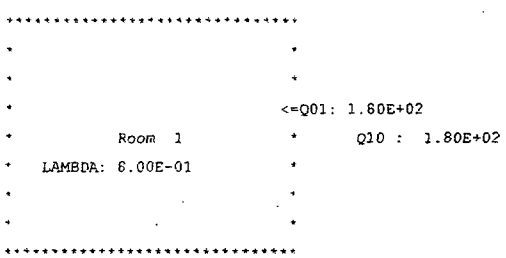
Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete
1	2	2.40E+00	0.00E+00	Concrete
1	3	2.40E+00	0.00E+00	Concrete
1	4	2.40E+00	0.00E+00	Concrete
1	5	2.40E+00	0.00E+00	Concrete
1	6	2.40E+00	0.00E+00	Concrete

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 HLSMEARMIX.bld

======== Building Information ========

Building Air Exchange Rate: 8.00E-01 1/hr

Height[m] Air Exchanges [m3/hr]
Area [m2]



Deposition velocity: 2.70E-06 [m/s] Resuspension Rate: 1.40E-05 [1/s]

======== Source Information ========

Source: 1
Location:: Room : 1 x: 0.00 y: 2.50 z: 1.50[m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
H-3	1.000E-10	6.400E-08	6.400E-08	0.000E+00

Source: 2
Location:: Room : 1 x: 15.00 y: 2.50 z: 1.50[m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
H-3	1.000E-10	6.400E-08	6.400E-08	0.000E+00

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 HLSMEARMIX.bld

Source: 3
Location:: Room : 1 x: 7.50 y: 0.00 z: 1.50[m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration [pCi/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/(pCi/m3)]
H-3	1.000E-10	6.400E-08	6.400E-08	0.000E+00

Source: 4
Location:: Room : 1 x: 7.50 y: 5.00 z: 1.50[m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration [pCi/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/(pCi/m3)]
H-3	1.000E-10	6.400E-08	6.400E-08	0.000E+00

Source: 5

Location:: Room : 1 x: 7.50 y: 2.50 z: 0.00[m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration [pCi/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/(pCi/m3)]
H-3	8.290E+00	6.400E-08	6.400E-08	0.000E+00

Source: 6

Location:: Room : 1 x: 7.50 y: 2.50 z: 3.00[m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration [pCi/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/(pCi/m3)]
H-3	1.000E-10	6.400E-08	6.400E-08	0.000E+00

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 HLSMEARMIX.bld
Evaluation Time: 0.00000000E+00 years

=== Assessment for Time: 1 ===
=== Time =0.00E+00 yr ===

======== Source Information ========

Source: 1
Location:: Room : 1 x: 0.00 y: 2.50 z: 1.50 [m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	H-3	1.000E-10

Source: 2
Location:: Room : 1 x: 15.00 y: 2.50 z: 1.50 [m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	H-3	1.000E-10

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 HLSMEARMIX.bld
Evaluation Time: 0.00000000E+00 years

Source: 3
Location:: Room : 1 x: 7.50 y: 0.00 z: 1.50 [m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	H-3	1.000E-10

Source: 4
Location:: Room : 1 x: 7.50 y: 5.00 z: 1.50 [m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	H-3	1.000E-10

Source: 5
Location:: Room : 1 x: 7.50 y: 2.50 z: 0.00 [m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	H-3	8.290E+00

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 HLSMEARMIX.bld
Duration Time: 0.00000000E+00 years

Source: 6
Location:: Room : 1 x: 7.50 y: 2.50 z: 3.00 [m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	H-3	1.000E-10

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 HLSMEARMIX.bld
Duration Time: 0.00000000E+00 years

RESRAD-BUILDDose Tables

Source Contributions to Receptor Doses

[mrem]

	Source 1	Source 2	Source 3	Source 4	Source 5	Source 6	Total
Receptor 1	9.39E-21	9.39E-21	2.82E-20	2.82E-20	3.89E-09	4.69E-20	3.89E-09
Total	9.39E-21	9.39E-21	2.82E-20	2.82E-20	3.89E-09	4.69E-20	3.89E-09

Title : Plymbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 HLSMEARMIX.bld
Duration Time: 0.00000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	5.84E-22	0.00E+00	8.80E-21
Total	0.00E+00	0.00E+00	0.00E+00	5.84E-22	0.00E+00	8.80E-21

Source: 2

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	5.84E-22	0.00E+00	8.80E-21
Total	0.00E+00	0.00E+00	0.00E+00	5.84E-22	0.00E+00	8.80E-21

Source: 3

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	1.75E-21	0.00E+00	2.64E-20
al	0.00E+00	0.00E+00	0.00E+00	1.75E-21	0.00E+00	2.64E-20

Source: 4

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	1.75E-21	0.00E+00	2.64E-20
Total	0.00E+00	0.00E+00	0.00E+00	1.75E-21	0.00E+00	2.64E-20

Source: 5

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	2.42E-10	0.00E+00	3.65E-09
Total	0.00E+00	0.00E+00	0.00E+00	2.42E-10	0.00E+00	3.65E-09

Source: 6

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	2.92E-21	0.00E+00	4.40E-20
Total	0.00E+00	0.00E+00	0.00E+00	2.92E-21	0.00E+00	4.40E-20

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 HLSMEARMIX.bid
Calculation Time: 0.00000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor 1	Total
H-3		
H-3	9.39E-21	9.39E-21

Source: 2

Nuclide	Receptor 1	Total
H-3		
H-3	9.39E-21	9.39E-21

Source: 3

Nuclide	Receptor 1	Total
H-3		
H-3	2.82E-20	2.82E-20

Source: 4

Nuclide	Receptor 1	Total
H-3		
H-3	2.82E-20	2.82E-20

Title : Plumbrook Duplicate
File : C:\Progrsm Files\RESRAD_Family\BUILD\Plum Brook H-3 HLSMEARMIX.bld
ation Time: 0.00000000E+00 years

Source: 5

Nuclide	Receptor 1	Total
H-3		
H-3	3.89E-09	3.89E-09

Source: 6

Nuclide	Receptor 1	Total
H-3		
H-3	4.69E-20	4.69E-20

Summary

RESRAD-BUILD Dose (Time) Tables

Receptor Dose Received for the Exposure Duration

(mrem)

	Evaluation Time [yr] 0.00E+00
1	3.89E-09

Receptor Dose/Yr Averaged Over Exposure Duration

(mrem/yr)

	Evaluation Time [yr] 0.00E+00
1	3.89E-09

Summary : RESRAD Default Parameters
File : Plumbrook Subsurface Modified HLSMEARMIX.RAD

Table of Contents

Part I: Mixture Sums and Single Radionuclide Guidelines

Summary : RESRAD Default Parameters
File : Plumbrook Subsurface Modified HLSMEARMIX.RAD

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

Menu	Parameter	Current Value	Default	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	6.720E+00	6.720E+00	DCF2(1)
B-1	Am-241	4.440E-01	4.440E-01	DCF2(2)
B-1	Am-243+D	4.400E-01	4.400E-01	DCF2(3)
B-1	C-14	2.090E-06	2.090E-06	DCF2(4)
B-1	Cm-243	3.070E-01	3.070E-01	DCF2(5)
B-1	Co-60	2.190E-04	2.190E-04	DCF2(7)
B-1	Cs-134	4.630E-05	4.630E-05	DCF2(8)
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2(9)
B-1	Eu-152	2.210E-04	2.210E-04	DCF2(10)
B-1	Eu-154	2.860E-04	2.860E-04	DCF2(12)
B-1	Eu-155	4.140E-05	4.140E-05	DCF2(13)
B-1	Fe-55	2.690E-06	2.690E-06	DCF2(14)
B-1	Gd-152	2.430E-01	2.430E-01	DCF2(15)
B-1	H-3	6.400E-08	6.400E-08	DCF2(16)
B-1	I-129	1.740E-04	1.740E-04	DCF2(17)
B-1	Na-22	7.660E-06	7.660E-06	DCF2(18)
B-1	Nb-94	4.140E-04	4.140E-04	DCF2(19)
B-1	Ni-59	2.700E-06	2.700E-06	DCF2(20)
B-1	Ni-63	6.290E-06	6.290E-06	DCF2(21)
B-1	Np-237+D	5.400E-01	5.400E-01	DCF2(22)
B-1	Pa-231	1.280E+00	1.280E+00	DCF2(23)
B-1	Pb-210+D	2.320E-02	2.320E-02	DCF2(24)
B-1	Pu-238	3.920E-01	3.920E-01	DCF2(25)
B-1	Pu-239	4.290E-01	4.290E-01	DCF2(26)
B-1	Pu-241+D	8.250E-03	8.250E-03	DCF2(27)
B-1	Pu-242	4.110E-01	4.110E-01	DCF2(29)
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF2(30)
B-1	Ra-228+D	5.080E-03	5.080E-03	DCF2(31)
B-1	Sr-90+D	1.310E-03	1.310E-03	DCF2(32)
B-1	Tc-99	8.330E-06	8.330E-06	DCF2(33)
B-1	Th-228+D	3.450E-01	3.450E-01	DCF2(34)
B-1	Th-229+D	2.160E+00	2.160E+00	DCF2(35)
B-1	Th-230	3.260E-01	3.260E-01	DCF2(36)
B-1	Th-232	1.640E+00	1.640E+00	DCF2(37)
B-1	U-233	1.350E-01	1.350E-01	DCF2(38)
B-1	U-234	1.320E-01	1.320E-01	DCF2(39)
B-1	U-235+D	1.230E-01	1.230E-01	DCF2(40)
B-1	U-236	1.250E-01	1.250E-01	DCF2(41)
B-1	U-238+D	1.180E-01	1.180E-01	DCF2(42)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	1.480E-02	1.480E-02	DCF3(1)
D-1	Am-241	3.640E-03	3.640E-03	DCF3(2)
D-1	Am-243+D	3.630E-03	3.630E-03	DCF3(3)
D-1	C-14	2.090E-06	2.090E-06	DCF3(4)
D-1	Cm-243	2.510E-03	2.510E-03	DCF3(5)
D-1	Co-60	2.690E-05	2.690E-05	DCF3(7)
D-1	Cs-134	7.330E-05	7.330E-05	DCF3(8)
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3(9)

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

Menu	Parameter	Current Value	Default	Parameter Name
D-1	Eu-152	6.480E-06	6.480E-06	DCF3(10)
D-1	Eu-154	9.550E-06	9.550E-06	DCF3(12)
D-1	Eu-155	1.530E-06	1.530E-06	DCF3(13)
D-1	Fe-55	6.070E-07	6.070E-07	DCF3(14)
D-1	Gd-152	1.610E-04	1.610E-04	DCF3(15)
D-1	H-3	6.400E-08	6.400E-08	DCF3(16)
D-1	I-129	2.760E-04	2.760E-04	DCF3(17)
D-1	Na-22	1.150E-05	1.150E-05	DCF3(18)
D-1	Nb-94	7.140E-06	7.140E-06	DCF3(19)
D-1	Ni-59	2.100E-07	2.100E-07	DCF3(20)
D-1	Ni-63	5.770E-07	5.770E-07	DCF3(21)
D-1	Np-237+D	4.440E-03	4.440E-03	DCF3(22)
D-1	Pa-231	1.060E-02	1.060E-02	DCF3(23)
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF3(24)
D-1	Pu-238	3.200E-03	3.200E-03	DCF3(25)
D-1	Pu-239	3.540E-03	3.540E-03	DCF3(26)
D-1	Pu-241+D	6.850E-05	6.850E-05	DCF3(27)
D-1	Pu-242	3.360E-03	3.360E-03	DCF3(29)
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF3(30)
D-1	Ra-228+D	1.440E-03	1.440E-03	DCF3(31)
D-1	Sr-90+D	1.530E-04	1.530E-04	DCF3(32)
D-1	Tc-99	1.460E-06	1.460E-06	DCF3(33)
D-1	Th-228+D	8.080E-04	8.080E-04	DCF3(34)
D-1	Th-229+D	4.030E-03	4.030E-03	DCF3(35)
D-1	Th-230	5.480E-04	5.480E-04	DCF3(36)
D-1	Th-232	2.730E-03	2.730E-03	DCF3(37)
D-1	U-233	2.890E-04	2.890E-04	DCF3(38)
D-1	U-234	2.830E-04	2.830E-04	DCF3(39)
D-1	U-235+D	2.670E-04	2.670E-04	DCF3(40)
D-1	U-236	2.690E-04	2.690E-04	DCF3(41)
D-1	U-238+D	2.690E-04	2.690E-04	DCF3(42)
D-34	Food transfer factors:			
D-34	Ac-227+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(1,1)
D-34	Ac-227+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,2)
D-34	Ac-227+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,3)
D-34				
D-34	Am-241 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(2,1)
D-34	Am-241 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-05	5.000E-05	RTF(2,2)
D-34	Am-241 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(2,3)
D-34				
D-34	Am-243+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(3,1)
D-34	Am-243+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-05	5.000E-05	RTF(3,2)
D-34	Am-243+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(3,3)
D-34	C-14 , plant/soil concentration ratio, dimensionless	5.500E+00	5.500E+00	RTF(4,1)
D-34	C-14 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.100E-02	3.100E-02	RTF(4,2)
D-34	C-14 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.200E-02	1.200E-02	RTF(4,3)
D-34				

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

Menu	Parameter	Current Value	Default	Parameter Name
D-34	Cm-243 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(5,1)
D-34	Cm-243 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(5,2)
D-34	Cm-243 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(5,3)
D-34				
D-34	Co-60 , plant/soil concentration ratio, dimensionless	8.000E-02	8.000E-02	RTF(7,1)
D-34	Co-60 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-02	2.000E-02	RTF(7,2)
D-34	Co-60 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(7,3)
D-34				
D-34	Cs-134 , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(8,1)
D-34	Cs-134 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(8,2)
D-34	Cs-134 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(8,3)
D-34				
D-34	Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(9,1)
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(9,2)
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(9,3)
D-34				
D-34	Eu-152 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(10,1)
D-34	Eu-152 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(10,2)
D-34	Eu-152 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(10,3)
D-34				
	Eu-154 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(12,1)
D-34	Eu-154 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(12,2)
D-34	Eu-154 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(12,3)
D-34				
D-34	Eu-155 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(13,1)
D-34	Eu-155 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(13,2)
D-34	Eu-155 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(13,3)
D-34				
D-34	Fe-55 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(14,1)
D-34	Fe-55 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-02	2.000E-02	RTF(14,2)
D-34	Fe-55 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(14,3)
D-34				
D-34	Gd-152 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(15,1)
D-34	Gd-152 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(15,2)
D-34	Gd-152 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(15,3)
D-34				
D-34	H-3 , plant/soil concentration ratio, dimensionless	4.800E+00	4.800E+00	RTF(16,1)
D-34	H-3 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.200E-02	1.200E-02	RTF(16,2)
D-34	H-3 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-02	1.000E-02	RTF(16,3)
D-34				
D-34	I-129 , plant/soil concentration ratio, dimensionless	2.000E-02	2.000E-02	RTF(17,1)
D-34	I-129 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	7.000E-03	7.000E-03	RTF(17,2)
D-34	I-129 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-02	1.000E-02	RTF(17,3)
D-34				
D-34	Na-22 , plant/soil concentration ratio, dimensionless	5.000E-02	5.000E-02	RTF(18,1)
	Na-22 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-02	8.000E-02	RTF(18,2)
	Na-22 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	4.000E-02	4.000E-02	RTF(18,3)
D-34				

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

Menu	Parameter	Current Value	Default	Parameter Name
D-34	Nb-94 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(19,1)
D-34	Nb-94 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-07	3.000E-07	RTF(19,2)
D-34	Nb-94 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(19,3)
D-34				
D-34	Ni-59 , plant/soil concentration ratio, dimensionless	5.000E-02	5.000E-02	RTF(20,1)
D-34	Ni-59 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(20,2)
D-34	Ni-59 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-02	2.000E-02	RTF(20,3)
D-34				
D-34	Ni-63 , plant/soil concentration ratio, dimensionless	5.000E-02	5.000E-02	RTF(21,1)
D-34	Ni-63 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(21,2)
D-34	Ni-63 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-02	2.000E-02	RTF(21,3)
D-34				
D-34	Np-237+D , plant/soil concentration ratio, dimensionless	2.000E-02	2.000E-02	RTF(22,1)
D-34	Np-237+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(22,2)
D-34	Np-237+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(22,3)
D-34				
D-34	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(23,1)
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(23,2)
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(23,3)
D-34				
	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(24,1)
	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(24,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(24,3)
D-34				
D-34	Pu-238 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(25,1)
D-34	Pu-238 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(25,2)
D-34	Pu-238 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(25,3)
D-34				
D-34	Pu-239 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(26,1)
D-34	Pu-239 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(26,2)
D-34	Pu-239 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(26,3)
D-34				
D-34	Pu-241+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(27,1)
D-34	Pu-241+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(27,2)
D-34	Pu-241+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(27,3)
D-34				
D-34	Pu-242 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(29,1)
D-34	Pu-242 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(29,2)
D-34	Pu-242 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(29,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(30,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(30,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(30,3)
D-34				
D-34	Ra-228+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(31,1)
D-34	Ra-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(31,2)
	Ra-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(31,3)
D-34				

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

Menu	Parameter	Current Value	Default	Parameter Name
D-34	Sr-90+D , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF(32,1)
D-34	Sr-90+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-03	8.000E-03	RTF(32,2)
D-34	Sr-90+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(32,3)
D-34				
D-34	Tc-99 , plant/soil concentration ratio, dimensionless	5.000E+00	5.000E+00	RTF(33,1)
D-34	Tc-99 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(33,2)
D-34	Tc-99 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(33,3)
D-34				
D-34	Th-228+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(34,1)
D-34	Th-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(34,2)
D-34	Th-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(34,3)
D-34				
D-34	Th-229+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(35,1)
D-34	Th-229+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(35,2)
D-34	Th-229+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(35,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(36,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(36,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(36,3)
D-34				
D-34	Th-232 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(37,1)
D-34	Th-232 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(37,2)
D-34	Th-232 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(37,3)
D-34				
D-34	U-233 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(38,1)
D-34	U-233 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(38,2)
D-34	U-233 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(38,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(39,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(39,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(39,3)
D-34				
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(40,1)
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(40,2)
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(40,3)
D-34				
D-34	U-236 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(41,1)
D-34	U-236 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(41,2)
D-34	U-236 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(41,3)
D-34				
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(42,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(42,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(42,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Ac-227+D , fish	1.500E+01	1.500E+01	BIOFAC(1,1)
D-5	Ac-227+D , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(1,2)
D-5				
D-5	Am-241 , fish	3.000E+01	3.000E+01	BIOFAC(2,1)
D-5	Am-241 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(2,2)

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: PGR 13 Morbidity

Menu	Parameter	Current Value	Default	Parameter Name
D-5	Am-243+D , fish	3.000E+01	3.000E+01	BIOFAC(3,1)
D-5	Am-243+D , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(3,2)
D-5				
D-5	C-14 , fish	5.000E+04	5.000E+04	BIOFAC(4,1)
D-5	C-14 , crustacea and mollusks	9.100E+03	9.100E+03	BIOFAC(4,2)
D-5				
D-5	Cm-243 , fish	3.000E+01	3.000E+01	BIOFAC(5,1)
D-5	Cm-243 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(5,2)
D-5				
D-5	Co-60 , fish	3.000E+02	3.000E+02	BIOFAC(7,1)
D-5	Co-60 , crustacea and mollusks	2.000E+02	2.000E+02	BIOFAC(7,2)
D-5				
D-5	Cs-134 , fish	2.000E+03	2.000E+03	BIOFAC(8,1)
D-5	Cs-134 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(8,2)
D-5				
D-5	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC(9,1)
D-5	Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(9,2)
D-5				
D-5	Eu-152 , fish	5.000E+01	5.000E+01	BIOFAC(10,1)
D-5	Eu-152 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(10,2)
D-5				
D-5	Eu-154 , fish	5.000E+01	5.000E+01	BIOFAC(12,1)
D-5	Eu-154 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(12,2)
D-5				
D-5	Eu-155 , fish	5.000E+01	5.000E+01	BIOFAC(13,1)
D-5	Eu-155 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(13,2)
D-5				
D-5	Fe-55 , fish	2.000E+02	2.000E+02	BIOFAC(14,1)
D-5	Fe-55 , crustacea and mollusks	3.200E+03	3.200E+03	BIOFAC(14,2)
D-5				
D-5	Gd-152 , fish	2.500E+01	2.500E+01	BIOFAC(15,1)
D-5	Gd-152 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(15,2)
D-5				
D-5	H-3 , fish	1.000E+00	1.000E+00	BIOFAC(16,1)
D-5	H-3 , crustacea and mollusks	1.000E+00	1.000E+00	BIOFAC(16,2)
D-5				
D-5	I-129 , fish	4.000E+01	4.000E+01	BIOFAC(17,1)
D-5	I-129 , crustacea and mollusks	5.000E+00	5.000E+00	BIOFAC(17,2)
D-5				
D-5	Na-22 , fish	2.000E+01	2.000E+01	BIOFAC(18,1)
D-5	Na-22 , crustacea and mollusks	2.000E+02	2.000E+02	BIOFAC(18,2)
D-5				
D-5	Nb-94 , fish	3.000E+02	3.000E+02	BIOFAC(19,1)
D-5	Nb-94 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(19,2)
D-5				
D-5	Ni-59 , fish	1.000E+02	1.000E+02	BIOFAC(20,1)
D-5	Ni-59 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(20,2)
D-5				
D-5	Ni-63 , fish	1.000E+02	1.000E+02	BIOFAC(21,1)
D-5	Ni-63 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(21,2)

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

Menu	Parameter	Current Value	Default	Parameter Name
D-5	Np-237+D , fish	3.000E+01	3.000E+01	BIOFAC(22,1)
D-5	Np-237+D , crustacea and mollusks	4.000E+02	4.000E+02	BIOFAC(22,2)
D-5				
D-5	Pa-231 , fish	1.000E+01	1.000E+01	BIOFAC(23,1)
D-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(23,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(24,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(24,2)
D-5				
D-5	Pu-238 , fish	3.000E+01	3.000E+01	BIOFAC(25,1)
D-5	Pu-238 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(25,2)
D-5				
D-5	Pu-239 , fish	3.000E+01	3.000E+01	BIOFAC(26,1)
D-5	Pu-239 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(26,2)
D-5				
D-5	Pu-241+D , fish	3.000E+01	3.000E+01	BIOFAC(27,1)
D-5	Pu-241+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(27,2)
D-5				
D-5	Pu-242 , fish	3.000E+01	3.000E+01	BIOFAC(29,1)
D-5	Pu-242 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(29,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(30,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(30,2)
D-5				
D-5	Ra-228+D , fish	5.000E+01	5.000E+01	BIOFAC(31,1)
D-5	Ra-228+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(31,2)
D-5				
D-5	Sr-90+D , fish	6.000E+01	6.000E+01	BIOFAC(32,1)
D-5	Sr-90+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(32,2)
D-5				
D-5	Tc-99 , fish	2.000E+01	2.000E+01	BIOFAC(33,1)
D-5	Tc-99 , crustacea and mollusks	5.000E+00	5.000E+00	BIOFAC(33,2)
D-5				
D-5	Th-228+D , fish	1.000E+02	1.000E+02	BIOFAC(34,1)
D-5	Th-228+D , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(34,2)
D-5				
D-5	Th-229+D , fish	1.000E+02	1.000E+02	BIOFAC(35,1)
D-5	Th-229+D , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(35,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(36,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(36,2)
D-5				
D-5	Th-232 , fish	1.000E+02	1.000E+02	BIOFAC(37,1)
D-5	Th-232 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(37,2)
D-5				
D-5	U-233 , fish	1.000E+01	1.000E+01	BIOFAC(38,1)
D-5	U-233 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(38,2)
D-5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(39,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(39,2)

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

Menu	Parameter	Current Value	Default	Parameter Name
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIOFAC(40,1)
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(40,2)
D-5				
D-5	U-236 , fish	1.000E+01	1.000E+01	BIOFAC(41,1)
D-5	U-236 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(41,2)
D-5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(42,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(42,2)

Summary : RESRAD Default Parameters
File : Plumbrook Subsurface Modified HLSMEARMIX.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)	3.850E+03	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	3.000E+00	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	7.000E+01	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	2.500E+01	---	BRDL
R011	Time since placement of material (yr)	1.000E+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): Am-241	1.900E-01	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): C-14	2.000E-01	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Cm-243	1.300E-01	0.000E+00	---	S1(5)
R012	Initial principal radionuclide (pCi/g): Co-60	2.380E+00	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): Cs-134	3.000E-02	0.000E+00	---	S1(8)
R012	Initial principal radionuclide (pCi/g): Cs-137	4.369E+01	0.000E+00	---	S1(9)
R012	Initial principal radionuclide (pCi/g): Eu-154	8.000E-02	0.000E+00	---	S1(12)
R012	Initial principal radionuclide (pCi/g): Fe-55	2.750E+00	0.000E+00	---	S1(14)
R012	Initial principal radionuclide (pCi/g): H-3	8.290E+00	0.000E+00	---	S1(16)
R012	Initial principal radionuclide (pCi/g): I-129	2.000E-02	0.000E+00	---	S1(17)
R012	Initial principal radionuclide (pCi/g): Na-22	3.000E-02	0.000E+00	---	S1(18)
R012	Initial principal radionuclide (pCi/g): Nb-94	1.200E-01	0.000E+00	---	S1(19)
R012	Initial principal radionuclide (pCi/g): Ni-59	3.300E-01	0.000E+00	---	S1(20)
R012	Initial principal radionuclide (pCi/g): Ni-63	1.339E+01	0.000E+00	---	S1(21)
R012	Initial principal radionuclide (pCi/g): Pu-238	1.100E-01	0.000E+00	---	S1(25)
R012	Initial principal radionuclide (pCi/g): Pu-239	1.300E-01	0.000E+00	---	S1(26)
R012	Initial principal radionuclide (pCi/g): Pu-241	1.190E+00	0.000E+00	---	S1(27)
R012	Initial principal radionuclide (pCi/g): Pu-242	6.000E-02	0.000E+00	---	S1(29)
R012	Initial principal radionuclide (pCi/g): Sr-90	2.543E+01	0.000E+00	---	S1(32)
R012	Initial principal radionuclide (pCi/g): Tc-99	5.800E-01	0.000E+00	---	S1(33)
R012	Initial principal radionuclide (pCi/g): U-234	3.000E-02	0.000E+00	---	S1(39)
R012	Concentration in groundwater (pCi/L): Am-241	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): C-14	not used	0.000E+00	---	W1(4)
R012	Concentration in groundwater (pCi/L): Cm-243	not used	0.000E+00	---	W1(5)
R012	Concentration in groundwater (pCi/L): Co-60	not used	0.000E+00	---	W1(7)
R012	Concentration in groundwater (pCi/L): Cs-134	not used	0.000E+00	---	W1(8)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	W1(9)
R012	Concentration in groundwater (pCi/L): Eu-154	not used	0.000E+00	---	W1(12)
R012	Concentration in groundwater (pCi/L): Fe-55	not used	0.000E+00	---	W1(14)
R012	Concentration in groundwater (pCi/L): H-3	not used	0.000E+00	---	W1(16)
R012	Concentration in groundwater (pCi/L): I-129	not used	0.000E+00	---	W1(17)
R012	Concentration in groundwater (pCi/L): Na-22	not used	0.000E+00	---	W1(18)
R012	Concentration in groundwater (pCi/L): Nb-94	not used	0.000E+00	---	W1(19)
R012	Concentration in groundwater (pCi/L): Ni-59	not used	0.000E+00	---	W1(20)
R012	Concentration in groundwater (pCi/L): Ni-63	not used	0.000E+00	---	W1(21)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R012	Concentration in groundwater (pCi/L): Pu-238	not used	0.000E+00	---	W1(25)
R012	Concentration in groundwater (pCi/L): Pu-239	not used	0.000E+00	---	W1(26)
R012	Concentration in groundwater (pCi/L): Pu-241	not used	0.000E+00	---	W1(27)
R012	Concentration in groundwater (pCi/L): Pu-242	not used	0.000E+00	---	W1(29)
R012	Concentration in groundwater (pCi/L): Sr-90	not used	0.000E+00	---	W1(32)
R012	Concentration in groundwater (pCi/L): Tc-99	not used	0.000E+00	---	W1(33)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(39)
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)	1.560E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.100E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	8.600E-01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	1.400E+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)	8.000E+00	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	8.600E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	1.040E+00	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)	1.000E+06	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	1.460E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	4.500E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	2.000E-01	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	2.000E-01	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	1.070E+03	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	4.500E-03	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	0.000E+00	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	2.010E+00	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	MB	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	1.180E+02	2.500E+02	---	UW
R015	Number of unsaturated zone strata	1	1	---	NS
R015	Unsat. zone 1, thickness (m)	0.000E+00	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.560E+00	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	4.100E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	3.000E-01	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	2.000E-01	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	1.400E+00	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	1.262E+03	1.000E+01	---	HCUZ(1)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Am-241				
R016	Contaminated zone (cm**3/g)	4.450E+02	2.000E+01	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.146E-04	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for C-14				
R016	Contaminated zone (cm**3/g)	2.600E+01	0.000E+00	---	DCNUCC(4)
R016	Unsaturated zone 1 (cm**3/g)	2.100E+01	0.000E+00	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	2.100E+01	0.000E+00	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.030E-03	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)
R016	Distribution coefficients for Cm-243				
R016	Contaminated zone (cm**3/g)	4.000E+02	-1.000E+00	---	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	6.760E+03	-1.000E+00	---	DCNUCU(5,1)
R016	Saturated zone (cm**3/g)	6.760E+03	-1.000E+00	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.612E-04	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R016	Distribution coefficients for Co-60				
R016	Contaminated zone (cm**3/g)	1.700E+01	1.000E+03	---	DCNUCC(7)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCU(7,1)
R016	Saturated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.069E-02	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for Cs-134				
R016	Contaminated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCC(8)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCU(8,1)
R016	Saturated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.846E-04	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	6.500E+00	1.000E+03	---	DCNUCC(9)
R016	Unsaturated zone 1 (cm**3/g)	4.470E+02	1.000E+03	---	DCNUCU(9,1)
R016	Saturated zone (cm**3/g)	4.470E+02	1.000E+03	---	DCNUCS(9)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.730E-02	ALEACH(9)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(9)
R016	Distribution coefficients for Eu-154				
R016	Contaminated zone (cm**3/g)	4.000E+02	-1.000E+00	---	DCNUCC(12)
R016	Unsaturated zone 1 (cm**3/g)	9.550E+02	-1.000E+00	---	DCNUCU(12,1)
R016	Saturated zone (cm**3/g)	9.550E+02	-1.000E+00	---	DCNUCS(12)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.612E-04	ALEACH(12)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(12)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Fe-55				
R016	Contaminated zone (cm**3/g)	1.300E+01	1.000E+03	---	DCNUCC(14)
R016	Unsaturated zone 1 (cm**3/g)	8.910E+02	1.000E+03	---	DCNUCU(14,1)
R016	Saturated zone (cm**3/g)	8.910E+02	1.000E+03	---	DCNUCS(14)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.392E-02	ALEACH(14)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(14)
R016	Distribution coefficients for H-3				
R016	Contaminated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCC(16)
R016	Unsaturated zone 1 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU(16,1)
R016	Saturated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCS(16)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.024E-01	ALEACH(16)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(16)
R016	Distribution coefficients for I-129				
R016	Contaminated zone (cm**3/g)	3.200E+00	1.000E-01	---	DCNUCC(17)
R016	Unsaturated zone 1 (cm**3/g)	1.000E-01	1.000E-01	---	DCNUCU(17,1)
R016	Saturated zone (cm**3/g)	1.000E-01	1.000E-01	---	DCNUCS(17)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.331E-02	ALEACH(17)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(17)
R016	Distribution coefficients for Na-22				
R016	Contaminated zone (cm**3/g)	1.000E+01	1.000E+01	---	DCNUCC(18)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+01	1.000E+01	---	DCNUCU(18,1)
R016	Saturated zone (cm**3/g)	1.000E+01	1.000E+01	---	DCNUCS(18)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.799E-02	ALEACH(18)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(18)
R016	Distribution coefficients for Nb-94				
R016	Contaminated zone (cm**3/g)	3.250E+02	0.000E+00	---	DCNUCC(19)
R016	Unsaturated zone 1 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU(19,1)
R016	Saturated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCS(19)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.676E-04	ALEACH(19)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(19)
R016	Distribution coefficients for Ni-59				
R016	Contaminated zone (cm**3/g)	3.200E+01	1.000E+03	---	DCNUCC(20)
R016	Unsaturated zone 1 (cm**3/g)	3.700E+01	1.000E+03	---	DCNUCU(20,1)
R016	Saturated zone (cm**3/g)	3.700E+01	1.000E+03	---	DCNUCS(20)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.722E-03	ALEACH(20)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(20)
R016	Distribution coefficients for Ni-63				
R016	Contaminated zone (cm**3/g)	3.200E+01	1.000E+03	---	DCNUCC(21)
R016	Unsaturated zone 1 (cm**3/g)	3.700E+01	1.000E+03	---	DCNUCU(21,1)
R016	Saturated zone (cm**3/g)	3.700E+01	1.000E+03	---	DCNUCS(21)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.722E-03	ALEACH(21)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(21)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Pu-238				
R016	Contaminated zone (cm**3/g)	1.625E+03	2.000E+03	---	DCNUCC(25)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCU(25,1)
R016	Saturated zone (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCS(25)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.136E-04	ALEACH(25)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(25)
R016	Distribution coefficients for Pu-239				
R016	Contaminated zone (cm**3/g)	1.625E+03	2.000E+03	---	DCNUCC(26)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCU(26,1)
R016	Saturated zone (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCS(26)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.136E-04	ALEACH(26)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(26)
R016	Distribution coefficients for Pu-241				
R016	Contaminated zone (cm**3/g)	1.625E+03	2.000E+03	---	DCNUCC(27)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCU(27,1)
R016	Saturated zone (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCS(27)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.136E-04	ALEACH(27)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(27)
R016	Distribution coefficients for Pu-242				
R016	Contaminated zone (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCC(29)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCU(29,1)
R016	Saturated zone (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCS(29)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.230E-05	ALEACH(29)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(29)
R016	Distribution coefficients for Sr-90				
R016	Contaminated zone (cm**3/g)	3.500E+00	3.000E+01	---	DCNUCC(32)
R016	Unsaturated zone 1 (cm**3/g)	3.200E+01	3.000E+01	---	DCNUCU(32,1)
R016	Saturated zone (cm**3/g)	3.200E+01	3.000E+01	---	DCNUCS(32)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.906E-02	ALEACH(32)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(32)
R016	Distribution coefficients for Tc-99				
R016	Contaminated zone (cm**3/g)	5.200E+00	0.000E+00	---	DCNUCC(33)
R016	Unsaturated zone 1 (cm**3/g)	7.000E+00	0.000E+00	---	DCNUCU(33,1)
R016	Saturated zone (cm**3/g)	7.000E+00	0.000E+00	---	DCNUCS(33)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.379E-02	ALEACH(33)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(33)
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	2.120E+02	5.000E+01	---	DCNUCC(39)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(39,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(39)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.697E-04	ALEACH(39)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(39)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for daughter Ac-227				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.111E-03	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for daughter Am-243				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.111E-03	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for daughter Eu-152				
R016	Contaminated zone (cm**3/g)	4.000E+02	-1.000E+00	---	DCNUCC(10)
R016	Unsaturated zone 1 (cm**3/g)	9.550E+02	-1.000E+00	---	DCNUCU(10,1)
R016	Saturated zone (cm**3/g)	9.550E+02	-1.000E+00	---	DCNUCS(10)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.612E-04	ALEACH(10)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(10)
R016	Distribution coefficients for daughter Eu-152				
R016	Contaminated zone (cm**3/g)	4.000E+02	-1.000E+00	---	DCNUCC(11)
R016	Unsaturated zone 1 (cm**3/g)	9.550E+02	-1.000E+00	---	DCNUCU(11,1)
R016	Saturated zone (cm**3/g)	9.550E+02	-1.000E+00	---	DCNUCS(11)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.612E-04	ALEACH(11)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(11)
R016	Distribution coefficients for daughter Eu-155				
R016	Contaminated zone (cm**3/g)	4.000E+02	-1.000E+00	---	DCNUCC(13)
R016	Unsaturated zone 1 (cm**3/g)	9.550E+02	-1.000E+00	---	DCNUCU(13,1)
R016	Saturated zone (cm**3/g)	9.550E+02	-1.000E+00	---	DCNUCS(13)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.612E-04	ALEACH(13)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(13)
R016	Distribution coefficients for daughter Gd-152				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCC(15)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU(15,1)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCS(15)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.237E-04	ALEACH(15)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(15)
R016	Distribution coefficients for daughter Np-237				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCC(22)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCU(22,1)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCS(22)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.164E-04	ALEACH(22)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(22)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for daughter Pa-231				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(23)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(23,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(23)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.673E-03	ALEACH(23)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(23)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC(24)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCU(24,1)
R016	Saturated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCS(24)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.841E-03	ALEACH(24)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(24)
R016	Distribution coefficients for daughter Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(30)
R016	Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU(30,1)
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCS(30)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.627E-03	ALEACH(30)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(30)
R016	Distribution coefficients for daughter Ra-228				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(31)
R016	Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU(31,1)
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCS(31)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.627E-03	ALEACH(31)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(31)
R016	Distribution coefficients for daughter Th-228				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(34)
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCU(34,1)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(34)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.077E-06	ALEACH(34)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(34)
R016	Distribution coefficients for daughter Th-229				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(35)
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCU(35,1)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(35)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.077E-06	ALEACH(35)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(35)
R016	Distribution coefficients for daughter Th-230				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(36)
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCU(36,1)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(36)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.077E-06	ALEACH(36)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(36)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for daughter Th-232				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(37)
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCU(37,1)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(37)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.077E-06	ALEACH(37)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(37)
R016	Distribution coefficients for daughter U-233				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(38)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(38,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(38)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.673E-03	ALEACH(38)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(38)
R016	Distribution coefficients for daughter U-235				
R016	Contaminated zone (cm**3/g)	2.120E+02	5.000E+01	---	DCNUCC(40)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(40,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(40)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.697E-04	ALEACH(40)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(40)
	Distribution coefficients for daughter U-236				
R016	Contaminated zone (cm**3/g)	2.120E+02	5.000E+01	---	DCNUCC(41)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(41,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(41)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.697E-04	ALEACH(41)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(41)
R016	Distribution coefficients for daughter U-238				
R016	Contaminated zone (cm**3/g)	2.120E+02	5.000E+01	---	DCNUCC(42)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(42,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(42)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.697E-04	ALEACH(42)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(42)
R017	Inhalation rate (m**3/yr)	8.400E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	6.000E-06	1.000E-04	---	MLINH
R017	Exposure duration	3.653E+02	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	4.700E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	6.600E-01	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	1.100E-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)	7.800E+01	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	1.500E+01	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	1.180E+02	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	5.200E+01	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	1.600E+01	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	0.000E+00	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	1.830E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	4.780E+02	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	1.000E+00	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	1.000E+00	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	1.000E+00	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	5.000E-01	5.000E-01	---	FR9
R018	Contamination fraction of plant food	1.000E+00	-1	---	FPLANT
R018	Contamination fraction of meat	1.000E+00	-1	---	FMEAT
R018	Contamination fraction of milk	1.000E+00	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	8.500E+00	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	1.700E+01	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	5.000E+01	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	1.600E+02	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	5.000E-01	5.000E-01	---	LSI

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)	1.000E-04	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	9.000E-01	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	1.000E+00	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	1.000E+00	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	1.000E+00	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	7.000E-01	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	1.500E+00	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	1.100E+00	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	1.700E-01	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	2.500E-01	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	8.000E-02	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	1.000E-01	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	1.000E+00	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	1.000E+00	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	2.000E+01	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	2.000E-05	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	3.000E-02	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	2.000E-02	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	9.800E-01	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	3.000E-01	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	7.000E-07	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	1.000E-10	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	8.000E-01	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	2.000E-01	2.000E-01	---	AVFG5
C14	DCF correction factor for gaseous forms of C14	8.894E+01	8.894E+01	---	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

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	1	---	---	KYMAX

Summary of Pathway Selections

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

Summary : RESRAD Default Parameters
File : Plumbrook Subsurface Modified HLSMEARMIX.RAD

Contaminated Zone Dimensions

Area:	3850.00 square meters
Thickness:	3.00 meters
Cover Depth:	0.00 meters

Initial Soil Concentrations, pCi/g

Am-241	1.900E-01
C-14	2.000E-01
Cm-243	1.300E-01
Co-60	2.380E+00
Cs-134	3.000E-02
Cs-137	4.369E+01
Eu-154	8.000E-02
Fe-55	2.750E+00
H-3	8.290E+00
I-129	2.000E-02
Na-22	3.000E-02
Nb-94	1.200E-01
Ni-59	3.300E-01
Ni-63	1.339E+01
Pu-238	1.100E-01
Pu-239	1.300E-01
Pu-241	1.190E+00
Pu-242	6.000E-02
Sr-90	2.543E+01
Tc-99	5.800E-01
U-234	3.000E-02

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):	1.522E+03	1.423E+03	1.246E+03	7.881E+02	2.224E+02	6.006E+00	1.496E+00	6.282E-01
M(t):	6.087E+01	5.693E+01	4.986E+01	3.152E+01	8.898E+00	2.402E-01	5.983E-02	2.513E-02

Maximum TDOSE(t): 1.522E+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-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	3.303E-03	0.0000	2.438E-04	0.0000	0.000E+00	0.0000	6.434E-02	0.0000	9.135E-04	0.0000	8.431E-05	0.0000	9.736E-03	0.0000
C-14	4.328E-07	0.0000	3.102E-05	0.0000	0.000E+00	0.0000	1.640E-01	0.0001	7.913E-02	0.0001	4.795E-02	0.0000	2.365E-06	0.0000
Cm-243	2.940E-02	0.0000	1.140E-04	0.0000	0.000E+00	0.0000	3.001E-02	0.0000	1.705E-04	0.0000	3.933E-05	0.0000	4.541E-03	0.0000
Co-60	1.389E+01	0.0091	1.405E-06	0.0000	0.000E+00	0.0000	4.441E-01	0.0003	7.352E-02	0.0000	2.622E-02	0.0000	8.409E-04	0.0000
Cs-134	9.260E-02	0.0001	3.412E-09	0.0000	0.000E+00	0.0000	6.947E-03	0.0000	2.447E-03	0.0000	2.080E-03	0.0000	2.631E-05	0.0000
Cs-137	5.577E+01	0.0366	3.931E-06	0.0000	0.000E+00	0.0000	7.931E+00	0.0052	2.799E+00	0.0018	2.377E+00	0.0016	3.002E-02	0.0000
Eu-154	2.285E-01	0.0002	6.363E-08	0.0000	0.000E+00	0.0000	1.709E-04	0.0000	3.982E-05	0.0000	9.405E-07	0.0000	1.035E-05	0.0000
Fe-55	0.000E+00	0.0000	1.875E-08	0.0000	0.000E+00	0.0000	1.362E-04	0.0000	7.740E-04	0.0000	2.677E-05	0.0000	2.061E-05	0.0000
H-3	0.000E+00	0.0000	2.186E-03	0.0000	0.000E+00	0.0000	8.163E-02	0.0001	4.671E-03	0.0000	9.947E-03	0.0000	3.928E-06	0.0000
I-129	1.028E-04	0.0000	9.802E-09	0.0000	0.000E+00	0.0000	1.002E-02	0.0000	1.317E-03	0.0000	5.346E-03	0.0000	7.575E-05	0.0000
Na-22	1.373E-01	0.0001	5.785E-10	0.0000	0.000E+00	0.0000	1.397E-03	0.0000	1.157E-03	0.0000	1.916E-03	0.0000	4.231E-06	0.0000
Nb-94	4.457E-01	0.0003	1.437E-07	0.0000	0.000E+00	0.0000	7.967E-04	0.0000	7.818E-09	0.0000	1.355E-07	0.0000	1.207E-05	0.0000
Ni-59	0.000E+00	0.0000	2.570E-09	0.0000	0.000E+00	0.0000	3.214E-04	0.0000	1.663E-05	0.0000	2.203E-04	0.0000	9.737E-07	0.0000
Ni-63	0.000E+00	0.0000	2.420E-07	0.0000	0.000E+00	0.0000	3.570E-02	0.0000	1.847E-03	0.0000	2.447E-02	0.0000	1.082E-04	0.0000
Pu-238	6.831E-06	0.0000	1.242E-04	0.0000	0.000E+00	0.0000	3.265E-02	0.0000	9.271E-04	0.0000	2.139E-05	0.0000	4.940E-03	0.0000
Pu-239	1.523E-05	0.0000	1.613E-04	0.0000	0.000E+00	0.0000	4.285E-02	0.0000	1.217E-03	0.0000	2.808E-05	0.0000	6.484E-03	0.0000
[illegible]-241	2.500E-05	0.0000	2.893E-05	0.0000	0.000E+00	0.0000	7.729E-03	0.0000	2.154E-04	0.0000	5.271E-06	0.0000	1.169E-03	0.0000
[illegible]-2	3.157E-06	0.0000	7.132E-05	0.0000	0.000E+00	0.0000	1.877E-02	0.0000	5.331E-04	0.0000	1.230E-05	0.0000	2.841E-03	0.0000
Sr-90	2.330E-01	0.0002	9.293E-05	0.0000	0.000E+00	0.0000	1.048E+02	0.0689	4.793E+00	0.0031	4.983E+00	0.0033	5.288E-02	0.0000
Tc-99	2.837E-05	0.0000	1.374E-08	0.0000	0.000E+00	0.0000	3.875E-01	0.0003	1.871E-04	0.0000	8.431E-03	0.0000	1.173E-05	0.0000
U-234	4.816E-06	0.0000	1.145E-05	0.0000	0.000E+00	0.0000	1.974E-03	0.0000	7.822E-05	0.0000	3.260E-04	0.0000	1.196E-04	0.0000
Total	7.083E+01	0.0465	3.071E-03	0.0000	0.000E+00	0.0000	1.141E+02	0.0750	7.760E+00	0.0051	7.487E+00	0.0049	1.138E-01	0.0001

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.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	7.414E-01	0.0005	1.453E-03	0.0000	0.000E+00	0.0000	4.175E-01	0.0003	5.250E-04	0.0000	1.173E-04	0.0000	1.240E+00	0.0008
C-14	3.760E-04	0.0000	1.243E-03	0.0000	0.000E+00	0.0000	6.146E-04	0.0000	3.215E-04	0.0000	4.839E-04	0.0000	2.941E-01	0.0002
Cm-243	3.847E-01	0.0003	7.437E-04	0.0000	0.000E+00	0.0000	2.167E-01	0.0001	1.090E-04	0.0000	6.085E-05	0.0000	6.666E-01	0.0004
Co-60	1.653E+00	0.0011	3.195E-02	0.0000	0.000E+00	0.0000	9.470E-01	0.0006	4.693E-01	0.0003	2.618E-01	0.0002	1.780E+01	0.0117
Cs-134	8.920E-04	0.0000	1.150E-04	0.0000	0.000E+00	0.0000	5.066E-04	0.0000	3.792E-04	0.0000	5.647E-04	0.0000	1.066E-01	0.0001
Cs-137	1.507E+02	0.0990	1.943E+01	0.0128	0.000E+00	0.0000	8.565E+01	0.0563	6.427E+01	0.0422	9.555E+01	0.0628	4.845E+02	0.3184
Eu-154	8.768E-04	0.0000	2.825E-06	0.0000	0.000E+00	0.0000	4.940E-04	0.0000	2.484E-05	0.0000	1.387E-06	0.0000	2.301E-01	0.0002
Fe-55	5.272E-02	0.0000	6.796E-04	0.0000	0.000E+00	0.0000	2.970E-02	0.0000	1.496E-02	0.0000	1.252E-03	0.0000	1.003E-01	0.0001
H-3	2.700E-01	0.0002	1.771E-05	0.0000	0.000E+00	0.0000	1.308E-01	0.0001	1.990E-02	0.0000	6.137E-02	0.0000	5.807E-01	0.0004
I-129	7.437E-01	0.0005	1.918E-03	0.0000	0.000E+00	0.0000	4.210E-01	0.0003	7.419E-02	0.0000	5.901E-01	0.0004	1.848E+00	0.0012
Na-22	1.399E-02	0.0000	1.804E-05	0.0000	0.000E+00	0.0000	7.968E-03	0.0000	1.590E-02	0.0000	4.434E-02	0.0000	2.240E-01	0.0001
Nb-94	1.258E-03	0.0000	2.432E-05	0.0000	0.000E+00	0.0000	7.100E-04	0.0000	5.347E-09	0.0000	1.990E-07	0.0000	4.485E-01	0.0003
Ni-59	1.024E-03	0.0000	6.596E-06	0.0000	0.000E+00	0.0000	5.827E-04	0.0000	7.259E-05	0.0000	1.621E-03	0.0000	3.865E-03	0.0000
Ni-63	1.137E-01	0.0001	7.327E-04	0.0000	0.000E+00	0.0000	6.473E-02	0.0000	8.064E-03	0.0000	1.800E-01	0.0001	4.294E-01	0.0003
Pu-238	1.031E-01	0.0001	1.992E-04	0.0000	0.000E+00	0.0000	5.804E-02	0.0000	1.460E-04	0.0000	8.164E-06	0.0000	2.001E-01	0.0001
Pu-239	1.353E-01	0.0001	2.615E-04	0.0000	0.000E+00	0.0000	7.618E-02	0.0001	1.916E-04	0.0000	1.070E-05	0.0000	2.627E-01	0.0002
Pu-241	3.440E-02	0.0000	6.636E-05	0.0000	0.000E+00	0.0000	1.932E-02	0.0000	4.057E-05	0.0000	3.545E-06	0.0000	6.301E-02	0.0000
Ra-226	4.815E-02	0.0000	9.308E-05	0.0000	0.000E+00	0.0000	2.712E-02	0.0000	6.819E-05	0.0000	3.808E-06	0.0000	9.767E-02	0.0001
Sr-90	4.777E+02	0.3139	1.848E+00	0.0012	0.000E+00	0.0000	2.868E+02	0.1885	5.471E+01	0.0360	7.609E+01	0.0500	1.012E+03	0.6650
Tc-99	7.295E-02	0.0000	9.406E-05	0.0000	0.000E+00	0.0000	8.600E-02	0.0001	1.131E-04	0.0000	6.205E-03	0.0000	5.616E-01	0.0004
U-234	1.910E-02	0.0000	1.231E-05	0.0000	0.000E+00	0.0000	1.076E-02	0.0000	9.199E-05	0.0000	9.065E-04	0.0000	3.339E-02	0.0000
Total	6.328E+02	0.4158	2.132E+01	0.0140	0.000E+00	0.0000	3.750E+02	0.2464	1.196E+02	0.0786	1.728E+02	0.1135	1.522E+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-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	3.297E-03	0.0000	2.433E-04	0.0000	0.000E+00	0.0000	6.421E-02	0.0000	9.117E-04	0.0000	8.414E-05	0.0000	9.716E-03	0.0000
C-14	4.699E-08	0.0000	3.368E-06	0.0000	0.000E+00	0.0000	1.826E-02	0.0000	9.562E-03	0.0000	5.632E-03	0.0000	2.568E-07	0.0000
Cm-243	2.868E-02	0.0000	1.112E-04	0.0000	0.000E+00	0.0000	2.928E-02	0.0000	1.663E-04	0.0000	3.837E-05	0.0000	4.431E-03	0.0000
Co-60	1.205E+01	0.0085	1.219E-06	0.0000	0.000E+00	0.0000	3.853E-01	0.0003	6.362E-02	0.0000	2.275E-02	0.0000	7.295E-04	0.0000
Cs-134	6.616E-02	0.0000	2.437E-09	0.0000	0.000E+00	0.0000	4.963E-03	0.0000	1.748E-03	0.0000	1.486E-03	0.0000	1.880E-05	0.0000
Cs-137	5.303E+01	0.0373	3.738E-06	0.0000	0.000E+00	0.0000	7.542E+00	0.0053	2.662E+00	0.0019	2.261E+00	0.0016	2.854E-02	0.0000
Eu-154	2.111E-01	0.0001	5.878E-08	0.0000	0.000E+00	0.0000	1.579E-04	0.0000	3.679E-05	0.0000	8.689E-07	0.0000	9.562E-06	0.0000
Fe-55	0.000E+00	0.0000	1.430E-08	0.0000	0.000E+00	0.0000	1.039E-04	0.0000	5.905E-04	0.0000	2.042E-05	0.0000	1.572E-05	0.0000
H-3	0.000E+00	0.0000	5.063E-04	0.0000	0.000E+00	0.0000	1.912E-02	0.0000	1.194E-03	0.0000	2.401E-03	0.0000	9.098E-07	0.0000
I-129	9.748E-05	0.0000	9.293E-09	0.0000	0.000E+00	0.0000	9.502E-03	0.0000	1.249E-03	0.0000	5.070E-03	0.0000	7.181E-05	0.0000
Na-22	1.033E-01	0.0001	4.353E-10	0.0000	0.000E+00	0.0000	1.051E-03	0.0000	8.713E-04	0.0000	1.442E-03	0.0000	3.184E-06	0.0000
Nb-94	4.455E-01	0.0003	1.436E-07	0.0000	0.000E+00	0.0000	7.962E-04	0.0000	7.813E-09	0.0000	1.354E-07	0.0000	1.206E-05	0.0000
Ni-59	0.000E+00	0.0000	2.555E-09	0.0000	0.000E+00	0.0000	3.196E-04	0.0000	1.654E-05	0.0000	2.190E-04	0.0000	9.681E-07	0.0000
Ni-63	0.000E+00	0.0000	2.389E-07	0.0000	0.000E+00	0.0000	3.524E-02	0.0000	1.824E-03	0.0000	2.415E-02	0.0000	1.068E-04	0.0000
Pu-238	6.776E-06	0.0000	1.232E-04	0.0000	0.000E+00	0.0000	3.239E-02	0.0000	9.197E-04	0.0000	2.123E-05	0.0000	4.901E-03	0.0000
Pu-239	1.522E-05	0.0000	1.613E-04	0.0000	0.000E+00	0.0000	4.285E-02	0.0000	1.217E-03	0.0000	2.807E-05	0.0000	6.483E-03	0.0000
Pu-241	5.618E-05	0.0000	2.995E-05	0.0000	0.000E+00	0.0000	7.995E-03	0.0000	2.143E-04	0.0000	5.849E-06	0.0000	1.210E-03	0.0000
[illegible]2	3.157E-06	0.0000	7.132E-05	0.0000	0.000E+00	0.0000	1.877E-02	0.0000	5.330E-04	0.0000	1.230E-05	0.0000	2.840E-03	0.0000
Sr-90	2.167E-01	0.0002	8.640E-05	0.0000	0.000E+00	0.0000	9.749E+01	0.0685	4.461E+00	0.0031	4.637E+00	0.0033	4.916E-02	0.0000
Tc-99	2.742E-05	0.0000	1.328E-08	0.0000	0.000E+00	0.0000	3.747E-01	0.0003	1.811E-04	0.0000	8.156E-03	0.0000	1.134E-05	0.0000
U-234	4.812E-06	0.0000	1.144E-05	0.0000	0.000E+00	0.0000	1.972E-03	0.0000	7.815E-05	0.0000	3.257E-04	0.0000	1.195E-04	0.0000
Total	6.615E+01	0.0465	1.353E-03	0.0000	0.000E+00	0.0000	1.061E+02	0.0745	7.208E+00	0.0051	6.970E+00	0.0049	1.084E-01	0.0001

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-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	7.396E-01	0.0005	1.430E-03	0.0000	0.000E+00	0.0000	4.166E-01	0.0003	5.238E-04	0.0000	1.170E-04	0.0000	1.237E+00	0.0009
C-14	4.087E-05	0.0000	1.366E-04	0.0000	0.000E+00	0.0000	6.845E-05	0.0000	3.735E-05	0.0000	5.341E-05	0.0000	3.379E-02	0.0000
Cm-243	3.752E-01	0.0003	7.253E-04	0.0000	0.000E+00	0.0000	2.113E-01	0.0001	1.063E-04	0.0000	5.934E-05	0.0000	6.501E-01	0.0005
Co-60	1.433E+00	0.0010	2.771E-02	0.0000	0.000E+00	0.0000	8.212E-01	0.0006	4.071E-01	0.0003	2.271E-01	0.0002	1.544E+01	0.0108
Cs-134	6.370E-04	0.0000	8.209E-05	0.0000	0.000E+00	0.0000	3.618E-04	0.0000	2.708E-04	0.0000	4.032E-04	0.0000	7.613E-02	0.0001
Cs-137	1.433E+02	0.1007	1.847E+01	0.0130	0.000E+00	0.0000	8.142E+01	0.0572	6.113E+01	0.0429	9.085E+01	0.0638	4.607E+02	0.3236
Eu-154	8.097E-04	0.0000	2.609E-06	0.0000	0.000E+00	0.0000	4.562E-04	0.0000	2.294E-05	0.0000	1.281E-06	0.0000	2.126E-01	0.0001
Fe-55	4.021E-02	0.0000	5.183E-04	0.0000	0.000E+00	0.0000	2.265E-02	0.0000	1.141E-02	0.0000	9.548E-04	0.0000	7.647E-02	0.0001
H-3	6.257E-02	0.0000	4.127E-06	0.0000	0.000E+00	0.0000	3.063E-02	0.0000	4.730E-03	0.0000	1.430E-02	0.0000	1.355E-01	0.0001
I-129	7.049E-01	0.0005	1.818E-03	0.0000	0.000E+00	0.0000	3.991E-01	0.0003	7.039E-02	0.0000	5.595E-01	0.0004	1.752E+00	0.0012
Na-22	1.053E-02	0.0000	1.357E-05	0.0000	0.000E+00	0.0000	5.994E-03	0.0000	1.196E-02	0.0000	3.336E-02	0.0000	1.685E-01	0.0001
Nb-94	1.257E-03	0.0000	2.430E-05	0.0000	0.000E+00	0.0000	7.093E-04	0.0000	5.342E-09	0.0000	1.989E-07	0.0000	4.483E-01	0.0003
Ni-59	1.017E-03	0.0000	6.556E-06	0.0000	0.000E+00	0.0000	5.792E-04	0.0000	7.216E-05	0.0000	1.611E-03	0.0000	3.842E-03	0.0000
Ni-63	1.122E-01	0.0001	7.231E-04	0.0000	0.000E+00	0.0000	6.388E-02	0.0000	7.959E-03	0.0000	1.777E-01	0.0001	4.236E-01	0.0003
Pu-238	1.022E-01	0.0001	1.976E-04	0.0000	0.000E+00	0.0000	5.756E-02	0.0000	1.447E-04	0.0000	8.105E-06	0.0000	1.985E-01	0.0001
Pu-239	1.352E-01	0.0001	2.614E-04	0.0000	0.000E+00	0.0000	7.615E-02	0.0001	1.915E-04	0.0000	1.069E-05	0.0000	2.626E-01	0.0002
Pu-241	4.037E-02	0.0000	7.788E-05	0.0000	0.000E+00	0.0000	2.268E-02	0.0000	4.397E-05	0.0000	4.572E-06	0.0000	7.269E-02	0.0001
[illegible]2	4.813E-02	0.0000	9.304E-05	0.0000	0.000E+00	0.0000	2.711E-02	0.0000	6.816E-05	0.0000	3.806E-06	0.0000	9.763E-02	0.0001
[illegible]	4.440E+02	0.3119	1.718E+00	0.0012	0.000E+00	0.0000	2.666E+02	0.1873	5.090E+01	0.0358	7.075E+01	0.0497	9.408E+02	0.6610
Tc-99	7.050E-02	0.0000	9.091E-05	0.0000	0.000E+00	0.0000	8.312E-02	0.0001	1.094E-04	0.0000	5.999E-03	0.0000	5.429E-01	0.0004
U-234	1.908E-02	0.0000	1.229E-05	0.0000	0.000E+00	0.0000	1.075E-02	0.0000	9.188E-05	0.0000	9.054E-04	0.0000	3.335E-02	0.0000
Total	5.911E-02	0.4153	2.022E+01	0.0142	0.000E+00	0.0000	3.503E+02	0.2461	1.125E+02	0.0791	1.626E+02	0.1143	1.423E+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-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	3.284E-03	0.0000	2.423E-04	0.0000	0.000E+00	0.0000	6.395E-02	0.0001	9.080E-04	0.0000	8.380E-05	0.0000	9.677E-03	0.0000
C-14	5.516E-10	0.0000	3.954E-08	0.0000	0.000E+00	0.0000	2.144E-04	0.0000	1.123E-04	0.0000	6.614E-05	0.0000	3.015E-09	0.0000
Cm-243	2.729E-02	0.0000	1.059E-04	0.0000	0.000E+00	0.0000	2.787E-02	0.0000	1.584E-04	0.0000	3.651E-05	0.0000	4.217E-03	0.0000
Co-60	9.068E+00	0.0073	9.173E-07	0.0000	0.000E+00	0.0000	2.899E-01	0.0002	4.787E-02	0.0000	1.712E-02	0.0000	5.489E-04	0.0000
Cs-134	3.376E-02	0.0000	1.244E-09	0.0000	0.000E+00	0.0000	2.533E-03	0.0000	8.922E-04	0.0000	7.584E-04	0.0000	9.593E-06	0.0000
Cs-137	4.794E+01	0.0385	3.380E-06	0.0000	0.000E+00	0.0000	6.819E+00	0.0055	2.407E+00	0.0019	2.044E+00	0.0016	2.581E-02	0.0000
Eu-154	1.802E-01	0.0001	5.017E-08	0.0000	0.000E+00	0.0000	1.347E-04	0.0000	3.140E-05	0.0000	7.416E-07	0.0000	8.161E-06	0.0000
Fe-55	0.000E+00	0.0000	8.323E-09	0.0000	0.000E+00	0.0000	6.050E-05	0.0000	3.437E-04	0.0000	1.189E-05	0.0000	9.150E-06	0.0000
H-3	0.000E+00	0.0000	2.713E-05	0.0000	0.000E+00	0.0000	1.025E-03	0.0000	6.398E-05	0.0000	1.287E-04	0.0000	4.875E-08	0.0000
I-129	8.762E-05	0.0000	8.353E-09	0.0000	0.000E+00	0.0000	8.541E-03	0.0000	1.123E-03	0.0000	4.557E-03	0.0000	6.455E-05	0.0000
Na-22	5.850E-02	0.0000	2.465E-10	0.0000	0.000E+00	0.0000	5.953E-04	0.0000	4.933E-04	0.0000	8.165E-04	0.0000	1.803E-06	0.0000
Nb-94	4.449E-01	0.0004	1.434E-07	0.0000	0.000E+00	0.0000	7.953E-04	0.0000	7.804E-09	0.0000	1.352E-07	0.0000	1.205E-05	0.0000
Ni-59	0.000E+00	0.0000	2.526E-09	0.0000	0.000E+00	0.0000	3.159E-04	0.0000	1.635E-05	0.0000	2.165E-04	0.0000	9.571E-07	0.0000
Ni-63	0.000E+00	0.0000	2.328E-07	0.0000	0.000E+00	0.0000	3.434E-02	0.0000	1.777E-03	0.0000	2.354E-02	0.0000	1.040E-04	0.0000
Pu-238	6.669E-06	0.0000	1.213E-04	0.0000	0.000E+00	0.0000	3.187E-02	0.0000	9.051E-04	0.0000	2.089E-05	0.0000	4.823E-03	0.0000
Pu-239	1.522E-05	0.0000	1.612E-04	0.0000	0.000E+00	0.0000	4.284E-02	0.0000	1.216E-03	0.0000	2.807E-05	0.0000	6.481E-03	0.0000
Pu-241	1.140E-04	0.0000	3.185E-05	0.0000	0.000E+00	0.0000	8.487E-03	0.0000	2.120E-04	0.0000	6.919E-06	0.0000	1.284E-03	0.0000
Ra-226	3.157E-06	0.0000	7.130E-05	0.0000	0.000E+00	0.0000	1.877E-02	0.0000	5.329E-04	0.0000	1.230E-05	0.0000	2.840E-03	0.0000
Sr-90	1.873E-01	0.0002	7.468E-05	0.0000	0.000E+00	0.0000	8.427E+01	0.0676	3.856E+00	0.0031	4.008E+00	0.0032	4.249E-02	0.0000
Tc-99	2.563E-05	0.0000	1.242E-08	0.0000	0.000E+00	0.0000	3.502E-01	0.0003	1.692E-04	0.0000	7.623E-03	0.0000	1.060E-05	0.0000
U-234	4.807E-06	0.0000	1.142E-05	0.0000	0.000E+00	0.0000	1.969E-03	0.0000	7.801E-05	0.0000	3.251E-04	0.0000	1.193E-04	0.0000
Total	5.795E+01	0.0465	8.518E-04	0.0000	0.000E+00	0.0000	9.197E+01	0.0738	6.320E+00	0.0051	6.108E+00	0.0049	9.851E-02	0.0001

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.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	7.361E-01	0.0006	1.423E-03	0.0000	0.000E+00	0.0000	4.146E-01	0.0003	5.213E-04	0.0000	1.164E-04	0.0000	1.231E+00	0.0010
C-14	4.790E-07	0.0000	1.602E-06	0.0000	0.000E+00	0.0000	8.023E-07	0.0000	4.378E-07	0.0000	6.260E-07	0.0000	3.968E-04	0.0000
Cm-243	3.568E-01	0.0003	6.897E-04	0.0000	0.000E+00	0.0000	2.010E-01	0.0002	1.011E-04	0.0000	5.644E-05	0.0000	6.183E-01	0.0005
Co-60	1.078E+00	0.0009	2.084E-02	0.0000	0.000E+00	0.0000	6.176E-01	0.0005	3.061E-01	0.0002	1.708E-01	0.0001	1.162E+01	0.0093
Cs-134	3.249E-04	0.0000	4.187E-05	0.0000	0.000E+00	0.0000	1.845E-04	0.0000	1.381E-04	0.0000	2.057E-04	0.0000	3.885E-02	0.0000
Cs-137	1.294E+02	0.1038	1.669E+01	0.0134	0.000E+00	0.0000	7.356E+01	0.0590	5.523E+01	0.0443	8.208E+01	0.0659	4.162E+02	0.3339
Eu-154	6.906E-04	0.0000	2.225E-06	0.0000	0.000E+00	0.0000	3.891E-04	0.0000	1.956E-05	0.0000	1.092E-06	0.0000	1.814E-01	0.0001
Fe-55	2.338E-02	0.0000	3.014E-04	0.0000	0.000E+00	0.0000	1.317E-02	0.0000	6.636E-03	0.0000	5.553E-04	0.0000	4.448E-02	0.0000
H-3	3.349E-03	0.0000	2.209E-07	0.0000	0.000E+00	0.0000	1.639E-03	0.0000	2.532E-04	0.0000	7.657E-04	0.0000	7.253E-03	0.0000
I-129	6.332E-01	0.0005	1.633E-03	0.0000	0.000E+00	0.0000	3.585E-01	0.0003	6.323E-02	0.0001	5.026E-01	0.0004	1.574E+00	0.0013
Na-22	5.956E-03	0.0000	7.678E-06	0.0000	0.000E+00	0.0000	3.392E-03	0.0000	6.770E-03	0.0000	1.888E-02	0.0000	9.541E-02	0.0001
Nb-94	1.255E-03	0.0000	2.425E-05	0.0000	0.000E+00	0.0000	7.080E-04	0.0000	5.332E-09	0.0000	1.985E-07	0.0000	4.477E-01	0.0004
Ni-59	1.005E-03	0.0000	6.477E-06	0.0000	0.000E+00	0.0000	5.722E-04	0.0000	7.129E-05	0.0000	1.592E-03	0.0000	3.796E-03	0.0000
Ni-63	1.093E-01	0.0001	7.041E-04	0.0000	0.000E+00	0.0000	6.221E-02	0.0000	7.750E-03	0.0000	1.730E-01	0.0001	4.127E-01	0.0003
Pu-238	1.005E-01	0.0001	1.943E-04	0.0000	0.000E+00	0.0000	5.661E-02	0.0000	1.424E-04	0.0000	7.990E-06	0.0000	1.952E-01	0.0002
Pu-239	1.351E-01	0.0001	2.611E-04	0.0000	0.000E+00	0.0000	7.607E-02	0.0001	1.913E-04	0.0000	1.068E-05	0.0000	2.624E-01	0.0002
Pu-241	5.143E-02	0.0000	9.927E-05	0.0000	0.000E+00	0.0000	2.891E-02	0.0000	5.038E-05	0.0000	6.488E-06	0.0000	9.063E-02	0.0001
[illegible]12	4.809E-02	0.0000	9.296E-05	0.0000	0.000E+00	0.0000	2.708E-02	0.0000	6.810E-05	0.0000	3.803E-06	0.0000	9.756E-02	0.0001
[illegible]J	3.835E+02	0.3077	1.484E+00	0.0012	0.000E+00	0.0000	2.303E+02	0.1848	4.397E+01	0.0353	6.112E+01	0.0490	8.128E+02	0.6521
Tc-99	6.585E-02	0.0001	8.491E-05	0.0000	0.000E+00	0.0000	7.764E-02	0.0001	1.022E-04	0.0000	5.603E-03	0.0000	5.073E-01	0.0004
U-234	1.903E-02	0.0000	1.226E-05	0.0000	0.000E+00	0.0000	1.072E-02	0.0000	9.166E-05	0.0000	9.032E-04	0.0000	3.327E-02	0.0000
Total	5.163E+02	0.4142	1.820E+01	0.0146	0.000E+00	0.0000	3.058E+02	0.2454	9.959E+01	0.0799	1.441E+02	0.1156	1.246E+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-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	3.238E-03	0.0000	2.389E-04	0.0000	0.000E+00	0.0000	6.306E-02	0.0001	8.954E-04	0.0000	8.263E-05	0.0000	9.541E-03	0.0000
C-14	9.217E-17	0.0000	6.606E-15	0.0000	0.000E+00	0.0000	3.583E-11	0.0000	1.880E-11	0.0000	1.107E-11	0.0000	5.038E-16	0.0000
Cm-243	2.294E-02	0.0000	8.904E-05	0.0000	0.000E+00	0.0000	2.344E-02	0.0000	1.334E-04	0.0000	3.070E-05	0.0000	3.546E-03	0.0000
Co-60	3.351E+00	0.0043	3.390E-07	0.0000	0.000E+00	0.0000	1.072E-01	0.0001	1.769E-02	0.0000	6.326E-03	0.0000	2.029E-04	0.0000
Cs-134	3.206E-03	0.0000	1.181E-10	0.0000	0.000E+00	0.0000	2.405E-04	0.0000	8.472E-05	0.0000	7.202E-05	0.0000	9.109E-07	0.0000
Cs-137	3.369E+01	0.0427	2.375E-06	0.0000	0.000E+00	0.0000	4.792E+00	0.0061	1.691E+00	0.0021	1.437E+00	0.0018	1.813E-02	0.0000
Eu-154	1.035E-01	0.0001	2.681E-08	0.0000	0.000E+00	0.0000	7.737E-05	0.0000	1.803E-05	0.0000	4.259E-07	0.0000	4.687E-06	0.0000
Fe-55	0.000E+00	0.0000	1.252E-09	0.0000	0.000E+00	0.0000	9.098E-06	0.0000	5.169E-05	0.0000	1.788E-06	0.0000	1.376E-06	0.0000
H-3	0.000E+00	0.0000	9.514E-10	0.0000	0.000E+00	0.0000	3.594E-08	0.0000	2.245E-09	0.0000	4.514E-09	0.0000	1.710E-12	0.0000
I-129	6.033E-05	0.0000	5.752E-09	0.0000	0.000E+00	0.0000	5.881E-03	0.0000	7.732E-04	0.0000	3.138E-03	0.0000	4.444E-05	0.0000
Na-22	7.992E-03	0.0000	3.367E-11	0.0000	0.000E+00	0.0000	8.132E-05	0.0000	6.739E-05	0.0000	1.115E-04	0.0000	2.463E-07	0.0000
Nb-94	4.431E-01	0.0006	1.428E-07	0.0000	0.000E+00	0.0000	7.919E-04	0.0000	7.771E-09	0.0000	1.346E-07	0.0000	1.200E-05	0.0000
Ni-59	0.000E+00	0.0000	2.427E-09	0.0000	0.000E+00	0.0000	3.035E-04	0.0000	1.570E-05	0.0000	2.080E-04	0.0000	9.195E-07	0.0000
Ni-63	0.000E+00	0.0000	2.127E-07	0.0000	0.000E+00	0.0000	3.137E-02	0.0000	1.623E-03	0.0000	2.150E-02	0.0000	9.503E-05	0.0000
Pu-238	6.305E-06	0.0000	1.147E-04	0.0000	0.000E+00	0.0000	3.014E-02	0.0000	8.557E-04	0.0000	1.978E-05	0.0000	4.560E-03	0.0000
Pu-239	1.520E-05	0.0000	1.611E-04	0.0000	0.000E+00	0.0000	4.279E-02	0.0001	1.215E-03	0.0000	2.804E-05	0.0000	6.475E-03	0.0000
Pu-241	2.758E-04	0.0000	3.707E-05	0.0000	0.000E+00	0.0000	9.842E-03	0.0000	2.050E-04	0.0000	9.899E-06	0.0000	1.489E-03	0.0000
[illegible]12	3.155E-06	0.0000	7.126E-05	0.0000	0.000E+00	0.0000	1.876E-02	0.0000	5.326E-04	0.0000	1.229E-05	0.0000	2.838E-03	0.0000
[illegible]	1.125E-01	0.0001	4.484E-05	0.0000	0.000E+00	0.0000	5.060E+01	0.0642	2.315E+00	0.0029	2.407E+00	0.0031	2.552E-02	0.0000
Tc-99	2.023E-05	0.0000	9.800E-09	0.0000	0.000E+00	0.0000	2.764E-01	0.0004	1.336E-04	0.0000	6.017E-03	0.0000	8.368E-06	0.0000
U-234	4.803E-06	0.0000	1.135E-05	0.0000	0.000E+00	0.0000	1.957E-03	0.0000	7.754E-05	0.0000	3.232E-04	0.0000	1.186E-04	0.0000
Total	3.774E+01	0.0479	7.713E-04	0.0000	0.000E+00	0.0000	5.601E+01	0.0711	4.031E+00	0.0051	3.881E+00	0.0049	7.259E-02	0.0001

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-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	7.241E-01	0.0009	1.400E-03	0.0000	0.000E+00	0.0000	4.078E-01	0.0005	5.129E-04	0.0000	1.145E-04	0.0000	1.211E+00	0.0015
C-14	7.958E-14	0.0000	2.661E-13	0.0000	0.000E+00	0.0000	1.333E-13	0.0000	7.277E-14	0.0000	1.040E-13	0.0000	6.636E-11	0.0000
Cm-243	2.993E-01	0.0004	5.786E-04	0.0000	0.000E+00	0.0000	1.686E-01	0.0002	8.484E-05	0.0000	4.734E-05	0.0000	5.188E-01	0.0007
Co-60	3.973E-01	0.0005	7.682E-03	0.0000	0.000E+00	0.0000	2.277E-01	0.0003	1.129E-01	0.0001	6.296E-02	0.0001	4.291E+00	0.0054
Cs-134	3.078E-05	0.0000	3.966E-06	0.0000	0.000E+00	0.0000	1.748E-05	0.0000	1.308E-05	0.0000	1.948E-05	0.0000	3.689E-03	0.0000
Cs-137	9.074E+01	0.1151	1.170E+01	0.0148	0.000E+00	0.0000	5.157E+01	0.0654	3.872E+01	0.0491	5.755E+01	0.0730	2.919E+02	0.3704
Eu-154	3.957E-04	0.0000	1.275E-06	0.0000	0.000E+00	0.0000	2.229E-04	0.0000	1.121E-05	0.0000	6.259E-07	0.0000	1.042E-01	0.0001
Fe-55	3.509E-03	0.0000	4.523E-05	0.0000	0.000E+00	0.0000	1.977E-03	0.0000	9.956E-04	0.0000	8.332E-05	0.0000	6.674E-03	0.0000
H-3	1.171E-07	0.0000	7.722E-12	0.0000	0.000E+00	0.0000	5.730E-08	0.0000	8.851E-09	0.0000	2.676E-08	0.0000	2.536E-07	0.0000
I-129	4.349E-01	0.0006	1.122E-03	0.0000	0.000E+00	0.0000	2.463E-01	0.0003	4.343E-02	0.0001	3.453E-01	0.0004	1.081E+00	0.0014
Na-22	8.117E-04	0.0000	1.046E-06	0.0000	0.000E+00	0.0000	4.622E-04	0.0000	9.226E-04	0.0000	2.573E-03	0.0000	1.302E-02	0.0000
Nb-94	1.246E-03	0.0000	2.410E-05	0.0000	0.000E+00	0.0000	7.034E-04	0.0000	5.297E-09	0.0000	1.972E-07	0.0000	4.458E-01	0.0006
Ni-59	9.634E-04	0.0000	6.208E-06	0.0000	0.000E+00	0.0000	5.485E-04	0.0000	6.833E-05	0.0000	1.525E-03	0.0000	3.640E-03	0.0000
Ni-63	9.957E-02	0.0001	6.417E-04	0.0000	0.000E+00	0.0000	5.669E-02	0.0001	7.062E-03	0.0000	1.577E-01	0.0002	3.762E-01	0.0005
Pu-238	9.481E-02	0.0001	1.833E-04	0.0000	0.000E+00	0.0000	5.340E-02	0.0001	1.343E-04	0.0000	7.601E-06	0.0000	1.842E-01	0.0002
Pu-239	1.346E-01	0.0002	2.602E-04	0.0000	0.000E+00	0.0000	7.582E-02	0.0001	1.907E-04	0.0000	1.065E-05	0.0000	2.616E-01	0.0003
Pu-241	8.216E-02	0.0001	1.587E-04	0.0000	0.000E+00	0.0000	4.623E-02	0.0001	6.812E-05	0.0000	1.182E-05	0.0000	1.405E-01	0.0002
[illegible]2	4.795E-02	0.0001	9.268E-05	0.0000	0.000E+00	0.0000	2.700E-02	0.0000	6.790E-05	0.0000	3.792E-06	0.0000	9.733E-02	0.0001
Sr-90	2.297E+02	0.2915	8.889E-01	0.0011	0.000E+00	0.0000	1.380E+02	0.1751	2.634E+01	0.0334	3.661E+01	0.0465	4.870E+02	0.6180
Tc-99	5.186E-02	0.0001	6.687E-05	0.0000	0.000E+00	0.0000	6.114E-02	0.0001	8.044E-05	0.0000	4.413E-03	0.0000	4.002E-01	0.0005
U-234	1.887E-02	0.0000	1.216E-05	0.0000	0.000E+00	0.0000	1.063E-02	0.0000	9.089E-05	0.0000	8.956E-04	0.0000	3.300E-02	0.0000
Total	3.229E+02	0.4097	1.260E+01	0.0160	0.000E+00	0.0000	1.909E+02	0.2423	6.522E+01	0.0828	9.473E+01	0.1202	7.881E+02	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-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	3.110E-03	0.0000	2.294E-04	0.0000	0.000E+00	0.0000	6.058E-02	0.0003	8.601E-04	0.0000	7.936E-05	0.0000	9.164E-03	0.0000
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.038E-30	0.0000	5.470E-31	0.0000	3.214E-31	0.0000	0.000E+00	0.0000
Cm-243	1.398E-02	0.0001	5.431E-05	0.0000	0.000E+00	0.0000	1.430E-02	0.0001	8.179E-05	0.0000	1.872E-05	0.0000	2.163E-03	0.0000
Co-60	1.950E-01	0.0009	1.973E-08	0.0000	0.000E+00	0.0000	6.236E-03	0.0000	1.030E-03	0.0000	3.682E-04	0.0000	1.181E-05	0.0000
Cs-134	3.842E-06	0.0000	1.415E-13	0.0000	0.000E+00	0.0000	2.882E-07	0.0000	1.015E-07	0.0000	8.631E-08	0.0000	1.092E-09	0.0000
Cs-137	1.229E+01	0.0553	8.666E-07	0.0000	0.000E+00	0.0000	1.749E+00	0.0079	6.172E-01	0.0028	5.242E-01	0.0024	6.618E-03	0.0000
Eu-154	2.122E-02	0.0001	5.907E-09	0.0000	0.000E+00	0.0000	1.586E-05	0.0000	3.697E-06	0.0000	8.732E-08	0.0000	9.609E-07	0.0000
Fe-55	0.000E+00	0.0000	5.582E-12	0.0000	0.000E+00	0.0000	4.057E-08	0.0000	2.305E-07	0.0000	7.972E-09	0.0000	6.136E-09	0.0000
H-3	0.000E+00	0.0000	1.562E-22	0.0000	0.000E+00	0.0000	5.904E-21	0.0000	3.693E-22	0.0000	7.422E-22	0.0000	2.808E-25	0.0000
I-129	2.077E-05	0.0000	1.980E-09	0.0000	0.000E+00	0.0000	2.025E-03	0.0000	2.662E-04	0.0000	1.080E-03	0.0000	1.530E-05	0.0000
Na-22	2.708E-05	0.0000	1.141E-13	0.0000	0.000E+00	0.0000	2.755E-07	0.0000	2.283E-07	0.0000	3.779E-07	0.0000	8.343E-10	0.0000
Nb-94	4.378E-01	0.0020	1.411E-07	0.0000	0.000E+00	0.0000	7.825E-04	0.0000	7.678E-09	0.0000	1.330E-07	0.0000	1.185E-05	0.0000
Ni-59	0.000E+00	0.0000	2.164E-09	0.0000	0.000E+00	0.0000	2.706E-04	0.0000	1.400E-05	0.0000	1.855E-04	0.0000	8.199E-07	0.0000
Ni-63	0.000E+00	0.0000	1.642E-07	0.0000	0.000E+00	0.0000	2.421E-02	0.0001	1.253E-03	0.0000	1.660E-02	0.0001	7.336E-05	0.0000
Pu-238	5.372E-06	0.0000	9.768E-05	0.0000	0.000E+00	0.0000	2.567E-02	0.0001	7.290E-04	0.0000	1.691E-05	0.0000	3.885E-03	0.0000
Pu-239	1.516E-05	0.0000	1.606E-04	0.0000	0.000E+00	0.0000	4.267E-02	0.0002	1.212E-03	0.0000	2.796E-05	0.0000	6.457E-03	0.0000
Pu-241	5.127E-04	0.0000	4.420E-05	0.0000	0.000E+00	0.0000	1.169E-02	0.0001	1.908E-04	0.0000	1.417E-05	0.0000	1.769E-03	0.0000
[illegible]42	3.149E-06	0.0000	7.112E-05	0.0000	0.000E+00	0.0000	1.872E-02	0.0001	5.316E-04	0.0000	1.227E-05	0.0000	2.833E-03	0.0000
[illegible]	2.619E-02	0.0001	1.044E-05	0.0000	0.000E+00	0.0000	1.178E+01	0.0530	5.392E-01	0.0024	5.604E-01	0.0025	5.941E-03	0.0000
Tc-99	1.029E-05	0.0000	4.985E-09	0.0000	0.000E+00	0.0000	1.406E-01	0.0006	6.795E-05	0.0000	3.061E-03	0.0000	4.257E-06	0.0000
U-234	4.922E-06	0.0000	1.116E-05	0.0000	0.000E+00	0.0000	1.924E-03	0.0000	7.621E-05	0.0000	3.176E-04	0.0000	1.166E-04	0.0000
Total	1.299E+01	0.0584	6.802E-04	0.0000	0.000E+00	0.0000	1.388E+01	0.0624	1.163E+00	0.0052	1.106E+00	0.0050	3.906E-02	0.0002

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-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	6.908E-01	0.0031	1.335E-03	0.0000	0.000E+00	0.0000	3.891E-01	0.0017	4.894E-04	0.0000	1.093E-04	0.0000	1.156E+00	0.0052
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.906E-30	0.0000
Cm-243	1.812E-01	0.0008	3.503E-04	0.0000	0.000E+00	0.0000	1.021E-01	0.0005	5.145E-05	0.0000	2.866E-05	0.0000	3.143E-01	0.0014
Co-60	2.297E-02	0.0001	4.441E-04	0.0000	0.000E+00	0.0000	1.316E-02	0.0001	6.524E-03	0.0000	3.640E-03	0.0000	2.494E-01	0.0011
Cs-134	3.664E-08	0.0000	4.721E-09	0.0000	0.000E+00	0.0000	2.081E-08	0.0000	1.558E-08	0.0000	2.319E-08	0.0000	4.420E-06	0.0000
Cs-137	3.289E+01	0.1479	4.241E+00	0.0191	0.000E+00	0.0000	1.869E+01	0.0840	1.403E+01	0.0631	2.086E+01	0.0938	1.059E+02	0.4761
Eu-154	8.059E-05	0.0000	2.596E-07	0.0000	0.000E+00	0.0000	4.540E-05	0.0000	2.283E-06	0.0000	1.275E-07	0.0000	2.137E-02	0.0001
Fe-55	1.554E-05	0.0000	2.003E-07	0.0000	0.000E+00	0.0000	8.755E-06	0.0000	4.419E-06	0.0000	3.690E-07	0.0000	2.956E-05	0.0000
H-3	1.904E-20	0.0000	1.256E-24	0.0000	0.000E+00	0.0000	9.319E-21	0.0000	1.440E-21	0.0000	4.352E-21	0.0000	4.132E-20	0.0000
I-129	1.467E-01	0.0007	3.837E-04	0.0000	0.000E+00	0.0000	8.422E-02	0.0004	1.485E-02	0.0001	1.181E-01	0.0005	3.697E-01	0.0017
Na-22	2.732E-06	0.0000	3.521E-09	0.0000	0.000E+00	0.0000	1.555E-06	0.0000	3.105E-06	0.0000	8.657E-06	0.0000	4.401E-05	0.0000
Nb-94	1.223E-03	0.0000	2.365E-05	0.0000	0.000E+00	0.0000	6.903E-04	0.0000	5.199E-09	0.0000	1.935E-07	0.0000	4.405E-01	0.0020
Ni-59	8.533E-04	0.0000	5.499E-06	0.0000	0.000E+00	0.0000	4.858E-04	0.0000	6.052E-05	0.0000	1.351E-03	0.0000	3.227E-03	0.0000
Ni-63	7.635E-02	0.0003	4.920E-04	0.0000	0.000E+00	0.0000	4.347E-02	0.0002	5.415E-03	0.0000	1.209E-01	0.0005	2.888E-01	0.0013
Pu-238	8.023E-02	0.0004	1.551E-04	0.0000	0.000E+00	0.0000	4.519E-02	0.0002	1.136E-04	0.0000	6.602E-06	0.0000	1.561E-01	0.0007
Pu-239	1.333E-01	0.0006	2.578E-04	0.0000	0.000E+00	0.0000	7.510E-02	0.0003	1.888E-04	0.0000	1.055E-05	0.0000	2.594E-01	0.0012
Pu-241	1.259E-01	0.0006	2.434E-04	0.0000	0.000E+00	0.0000	7.091E-02	0.0003	9.296E-05	0.0000	1.948E-05	0.0000	2.114E-01	0.0010
Pu-242	4.753E-02	0.0002	9.189E-05	0.0000	0.000E+00	0.0000	2.677E-02	0.0001	6.732E-05	0.0000	3.759E-06	0.0000	9.664E-02	0.0004
[illegible]	5.314E+01	0.2389	2.056E-01	0.0009	0.000E+00	0.0000	3.191E+01	0.1435	6.092E+00	0.0274	8.469E+00	0.0381	1.127E+02	0.5068
Tc-99	2.620E-02	0.0001	3.378E-05	0.0000	0.000E+00	0.0000	3.089E-02	0.0001	4.065E-05	0.0000	2.230E-03	0.0000	2.032E-01	0.0009
U-234	1.842E-02	0.0001	1.188E-05	0.0000	0.000E+00	0.0000	1.038E-02	0.0000	8.873E-05	0.0000	8.743E-04	0.0000	3.223E-02	0.0001
Total	8.759E+01	0.3937	4.450E+00	0.0200	0.000E+00	0.0000	5.150E+01	0.2315	2.015E+01	0.0906	2.958E+01	0.1330	2.224E+02	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-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	2.702E-03	0.0004	1.992E-04	0.0000	0.000E+00	0.0000	5.263E-02	0.0088	7.474E-04	0.0001	6.891E-05	0.0000	7.956E-03	0.0013
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cm-243	2.466E-03	0.0004	9.736E-06	0.0000	0.000E+00	0.0000	2.563E-03	0.0004	1.558E-05	0.0000	3.329E-06	0.0000	3.878E-04	0.0001
Co-60	9.274E-06	0.0000	9.381E-13	0.0000	0.000E+00	0.0000	2.965E-07	0.0000	4.896E-08	0.0000	1.751E-08	0.0000	5.614E-10	0.0000
Cs-134	2.289E-16	0.0000	8.434E-24	0.0000	0.000E+00	0.0000	1.717E-17	0.0000	6.050E-18	0.0000	5.143E-18	0.0000	6.505E-20	0.0000
Cs-137	3.609E-01	0.0601	2.544E-08	0.0000	0.000E+00	0.0000	5.133E-02	0.0085	1.812E-02	0.0030	1.539E-02	0.0026	1.943E-04	0.0000
Eu-154	8.281E-05	0.0000	2.306E-11	0.0000	0.000E+00	0.0000	6.192E-08	0.0000	1.443E-08	0.0000	3.408E-10	0.0000	3.751E-09	0.0000
Fe-55	0.000E+00	0.0000	3.305E-20	0.0000	0.000E+00	0.0000	2.402E-16	0.0000	1.365E-15	0.0000	4.719E-17	0.0000	3.633E-17	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	4.974E-07	0.0000	4.742E-11	0.0000	0.000E+00	0.0000	4.848E-05	0.0000	6.374E-06	0.0000	2.587E-05	0.0000	3.664E-07	0.0000
Na-22	6.128E-14	0.0000	2.582E-22	0.0000	0.000E+00	0.0000	6.235E-16	0.0000	5.167E-16	0.0000	8.551E-16	0.0000	1.888E-18	0.0000
Nb-94	4.197E-01	0.0699	1.353E-07	0.0000	0.000E+00	0.0000	7.502E-04	0.0001	7.361E-09	0.0000	1.275E-07	0.0000	1.136E-05	0.0000
Ni-59	0.000E+00	0.0000	1.449E-09	0.0000	0.000E+00	0.0000	1.812E-04	0.0000	9.375E-06	0.0000	1.242E-04	0.0000	5.489E-07	0.0000
Ni-63	0.000E+00	0.0000	6.634E-08	0.0000	0.000E+00	0.0000	9.786E-03	0.0016	5.064E-04	0.0001	6.707E-03	0.0011	2.965E-05	0.0000
Pu-238	3.069E-06	0.0000	5.575E-05	0.0000	0.000E+00	0.0000	1.465E-02	0.0024	4.161E-04	0.0001	9.821E-06	0.0000	2.217E-03	0.0004
Pu-239	1.501E-05	0.0000	1.590E-04	0.0000	0.000E+00	0.0000	4.225E-02	0.0070	1.200E-03	0.0002	2.768E-05	0.0000	6.393E-03	0.0011
Pu-241	5.814E-04	0.0001	4.309E-05	0.0000	0.000E+00	0.0000	1.138E-02	0.0019	1.625E-04	0.0000	1.487E-05	0.0000	1.721E-03	0.0003
[illegible]2	3.128E-06	0.0000	7.066E-05	0.0000	0.000E+00	0.0000	1.860E-02	0.0031	5.281E-04	0.0001	1.218E-05	0.0000	2.814E-03	0.0005
[illegible]	1.595E-04	0.0000	6.362E-08	0.0000	0.000E+00	0.0000	7.179E-02	0.0120	3.285E-03	0.0005	3.415E-03	0.0006	3.620E-05	0.0000
Tc-99	9.660E-07	0.0000	4.679E-10	0.0000	0.000E+00	0.0000	1.320E-02	0.0022	6.378E-06	0.0000	2.873E-04	0.0000	3.995E-07	0.0000
U-234	6.676E-06	0.0000	1.052E-05	0.0000	0.000E+00	0.0000	1.815E-03	0.0003	7.180E-05	0.0000	2.989E-04	0.0000	1.098E-04	0.0000
Total	7.866E-01	0.1310	5.483E-04	0.0001	0.000E+00	0.0000	2.910E-01	0.0484	2.507E-02	0.0042	2.638E-02	0.0044	2.187E-02	0.0036

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-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	5.857E-01	0.0975	1.132E-03	0.0002	0.000E+00	0.0000	3.299E-01	0.0549	4.153E-04	0.0001	9.265E-05	0.0000	9.815E-01	0.1634
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cm-243	3.139E-02	0.0052	6.068E-05	0.0000	0.000E+00	0.0000	1.768E-02	0.0029	9.073E-06	0.0000	4.954E-06	0.0000	5.459E-02	0.0091
Co-60	1.066E-06	0.0000	2.062E-08	0.0000	0.000E+00	0.0000	6.111E-07	0.0000	3.029E-07	0.0000	1.690E-07	0.0000	1.181E-05	0.0000
Cs-134	2.131E-18	0.0000	2.747E-19	0.0000	0.000E+00	0.0000	1.211E-18	0.0000	9.062E-19	0.0000	1.349E-18	0.0000	2.632E-16	0.0000
Cs-137	9.428E-01	0.1570	1.216E-01	0.0202	0.000E+00	0.0000	5.358E-01	0.0892	4.023E-01	0.0670	5.979E-01	0.0996	3.046E+00	0.5072
Eu-154	3.071E-07	0.0000	9.895E-10	0.0000	0.000E+00	0.0000	1.730E-07	0.0000	8.700E-09	0.0000	4.858E-10	0.0000	8.338E-05	0.0000
Fe-55	8.984E-14	0.0000	1.158E-15	0.0000	0.000E+00	0.0000	5.061E-14	0.0000	2.549E-14	0.0000	2.133E-15	0.0000	1.709E-13	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	3.478E-03	0.0006	8.972E-06	0.0000	0.000E+00	0.0000	1.969E-03	0.0003	3.473E-04	0.0001	2.761E-03	0.0005	8.645E-03	0.0014
Na-22	6.036E-15	0.0000	7.781E-18	0.0000	0.000E+00	0.0000	3.437E-15	0.0000	6.861E-15	0.0000	1.913E-14	0.0000	9.874E-14	0.0000
Nb-94	1.145E-03	0.0002	2.214E-05	0.0000	0.000E+00	0.0000	6.462E-04	0.0001	4.867E-09	0.0000	1.812E-07	0.0000	4.223E-01	0.0703
Ni-59	5.578E-04	0.0001	3.595E-06	0.0000	0.000E+00	0.0000	3.176E-04	0.0001	3.956E-05	0.0000	8.832E-04	0.0001	2.117E-03	0.0004
Ni-63	3.013E-02	0.0050	1.942E-04	0.0000	0.000E+00	0.0000	1.715E-02	0.0029	2.137E-03	0.0004	4.771E-02	0.0079	1.143E-01	0.0190
Pu-238	4.472E-02	0.0074	8.642E-05	0.0000	0.000E+00	0.0000	2.518E-02	0.0042	6.337E-05	0.0000	4.142E-06	0.0000	8.741E-02	0.0146
Pu-239	1.289E-01	0.0215	2.492E-04	0.0000	0.000E+00	0.0000	7.260E-02	0.0121	1.826E-04	0.0000	1.019E-05	0.0000	2.520E-01	0.0420
Pu-241	1.322E-01	0.0220	2.556E-04	0.0000	0.000E+00	0.0000	7.447E-02	0.0124	9.386E-05	0.0000	2.090E-05	0.0000	2.210E-01	0.0368
Ra-226	4.611E-02	0.0077	8.913E-05	0.0000	0.000E+00	0.0000	2.597E-02	0.0043	6.530E-05	0.0000	3.646E-06	0.0000	9.426E-02	0.0157
Sr-90	3.161E-01	0.0526	1.223E-03	0.0002	0.000E+00	0.0000	1.899E-01	0.0316	3.624E-02	0.0060	5.038E-02	0.0084	6.725E-01	0.1120
Tc-99	2.401E-03	0.0004	3.096E-06	0.0000	0.000E+00	0.0000	2.831E-03	0.0005	3.725E-06	0.0000	2.043E-04	0.0000	1.894E-02	0.0032
U-234	1.694E-02	0.0028	1.111E-05	0.0000	0.000E+00	0.0000	9.542E-03	0.0016	8.167E-05	0.0000	6.036E-04	0.0001	2.969E-02	0.0049
Total	2.283E+00	0.3801	1.249E-01	0.0208	0.000E+00	0.0000	1.304E+00	0.2171	4.420E-01	0.0736	7.008E-01	0.1167	6.006E+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-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	1.808E-03	0.0012	1.331E-04	0.0001	0.000E+00	0.0000	3.522E-02	0.0235	5.005E-04	0.0003	4.604E-05	0.0000	5.314E-03	0.0036
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cm-243	1.741E-05	0.0000	2.476E-07	0.0000	0.000E+00	0.0000	6.562E-05	0.0000	1.460E-06	0.0000	5.463E-08	0.0000	9.929E-06	0.0000
Co-60	4.133E-18	0.0000	4.181E-25	0.0000	0.000E+00	0.0000	1.321E-19	0.0000	2.182E-20	0.0000	7.801E-21	0.0000	2.502E-22	0.0000
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	1.511E-05	0.0000	1.066E-12	0.0000	0.000E+00	0.0000	2.150E-06	0.0000	7.588E-07	0.0000	6.445E-07	0.0000	8.136E-09	0.0000
Eu-154	1.088E-11	0.0000	3.028E-18	0.0000	0.000E+00	0.0000	8.132E-15	0.0000	1.895E-15	0.0000	4.476E-17	0.0000	4.926E-16	0.0000
Fe-55	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	1.164E-11	0.0000	1.110E-15	0.0000	0.000E+00	0.0000	1.135E-09	0.0000	1.492E-10	0.0000	6.054E-10	0.0000	8.575E-12	0.0000
Na-22	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Nb-94	3.721E-01	0.2488	1.199E-07	0.0000	0.000E+00	0.0000	6.651E-04	0.0004	6.526E-09	0.0000	1.131E-07	0.0000	1.008E-05	0.0000
Ni-59	0.000E+00	0.0000	4.604E-10	0.0000	0.000E+00	0.0000	5.758E-05	0.0000	2.980E-06	0.0000	3.947E-05	0.0000	1.745E-07	0.0000
Ni-63	0.000E+00	0.0000	4.985E-09	0.0000	0.000E+00	0.0000	7.353E-04	0.0005	3.805E-05	0.0000	5.039E-04	0.0003	2.228E-06	0.0000
Pu-238	6.325E-07	0.0000	1.123E-05	0.0000	0.000E+00	0.0000	2.952E-03	0.0020	8.384E-05	0.0001	2.256E-06	0.0000	4.465E-04	0.0003
Pu-239	1.460E-05	0.0000	1.546E-04	0.0001	0.000E+00	0.0000	4.106E-02	0.0275	1.166E-03	0.0008	2.690E-05	0.0000	6.213E-03	0.0042
Pu-241	3.928E-04	0.0003	2.891E-05	0.0000	0.000E+00	0.0000	7.650E-03	0.0051	1.087E-04	0.0001	1.000E-05	0.0000	1.155E-03	0.0008
[illegible]2	3.070E-06	0.0000	6.934E-05	0.0000	0.000E+00	0.0000	1.825E-02	0.0122	5.182E-04	0.0003	1.196E-05	0.0000	2.762E-03	0.0018
S[illegible]	7.478E-11	0.0000	2.982E-14	0.0000	0.000E+00	0.0000	3.365E-08	0.0000	1.540E-09	0.0000	1.601E-09	0.0000	1.697E-11	0.0000
Tc-99	1.120E-09	0.0000	5.426E-13	0.0000	0.000E+00	0.0000	1.531E-05	0.0000	7.396E-09	0.0000	3.332E-07	0.0000	4.633E-10	0.0000
U-234	1.946E-05	0.0000	8.880E-06	0.0000	0.000E+00	0.0000	1.561E-03	0.0010	6.103E-05	0.0000	2.521E-04	0.0002	9.295E-05	0.0001
Total	3.744E-01	0.2503	4.064E-04	0.0003	0.000E+00	0.0000	1.082E-01	0.0724	2.482E-03	0.0017	8.938E-04	0.0006	1.601E-02	0.0107

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-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	3.643E-01	0.2435	7.041E-04	0.0005	0.000E+00	0.0000	2.052E-01	0.1372	2.592E-04	0.0002	5.764E-05	0.0000	6.135E-01	0.4102
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cm-243	3.530E-04	0.0002	6.823E-07	0.0000	0.000E+00	0.0000	1.988E-04	0.0001	2.618E-07	0.0000	4.481E-08	0.0000	6.475E-04	0.0004
Co-60	4.425E-19	0.0000	8.555E-21	0.0000	0.000E+00	0.0000	2.536E-19	0.0000	1.257E-19	0.0000	7.011E-20	0.0000	5.195E-18	0.0000
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	3.676E-05	0.0000	4.740E-06	0.0000	0.000E+00	0.0000	2.089E-05	0.0000	1.569E-05	0.0000	2.331E-05	0.0000	1.201E-04	0.0001
Eu-154	3.755E-14	0.0000	1.210E-16	0.0000	0.000E+00	0.0000	2.116E-14	0.0000	1.064E-15	0.0000	5.940E-17	0.0000	1.095E-11	0.0000
Fe-55	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	7.577E-08	0.0000	1.955E-10	0.0000	0.000E+00	0.0000	4.290E-08	0.0000	7.567E-09	0.0000	6.015E-08	0.0000	1.885E-07	0.0000
Na-22	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Nb-94	9.453E-04	0.0006	1.827E-05	0.0000	0.000E+00	0.0000	5.335E-04	0.0004	4.017E-09	0.0000	1.496E-07	0.0000	3.743E-01	0.2503
Ni-59	1.651E-04	0.0001	1.064E-06	0.0000	0.000E+00	0.0000	9.397E-05	0.0001	1.171E-05	0.0000	2.614E-04	0.0002	6.334E-04	0.0004
Ni-63	2.108E-03	0.0014	1.358E-05	0.0000	0.000E+00	0.0000	1.200E-03	0.0008	1.495E-04	0.0001	3.337E-03	0.0022	8.087E-03	0.0054
Pu-238	8.398E-03	0.0056	1.621E-05	0.0000	0.000E+00	0.0000	4.730E-03	0.0032	1.195E-05	0.0000	1.479E-06	0.0000	1.665E-02	0.0111
Pu-239	1.167E-01	0.0780	2.255E-04	0.0002	0.000E+00	0.0000	6.570E-02	0.0439	1.652E-04	0.0001	9.226E-06	0.0000	2.314E-01	0.1547
Pu-241	8.288E-02	0.0554	1.602E-04	0.0001	0.000E+00	0.0000	4.668E-02	0.0312	5.895E-05	0.0000	1.311E-05	0.0000	1.391E-01	0.0930
Ra-226	4.213E-02	0.0282	8.144E-05	0.0001	0.000E+00	0.0000	2.373E-02	0.0159	5.966E-05	0.0000	3.332E-06	0.0000	8.762E-02	0.0586
Sr-90	1.380E-07	0.0000	5.338E-10	0.0000	0.000E+00	0.0000	8.286E-08	0.0000	1.582E-08	0.0000	2.199E-08	0.0000	2.960E-07	0.0000
Tc-99	2.593E-06	0.0000	3.343E-09	0.0000	0.000E+00	0.0000	3.057E-06	0.0000	4.022E-09	0.0000	2.206E-07	0.0000	2.153E-05	0.0000
U-234	1.335E-02	0.0089	1.037E-05	0.0000	0.000E+00	0.0000	7.523E-03	0.0050	6.517E-05	0.0000	6.324E-04	0.0004	2.358E-02	0.0158
Total	6.313E-01	0.4221	1.236E-03	0.0008	0.000E+00	0.0000	3.556E-01	0.2377	7.973E-04	0.0005	4.340E-03	0.0029	1.496E+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-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	4.461E-04	0.0007	3.241E-05	0.0001	0.000E+00	0.0000	8.688E-03	0.0138	1.240E-04	0.0002	1.124E-05	0.0000	1.295E-03	0.0021
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cm-243	1.549E-08	0.0000	1.631E-07	0.0000	0.000E+00	0.0000	4.334E-05	0.0001	1.231E-06	0.0000	2.840E-08	0.0000	6.558E-06	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	7.185E-21	0.0000	5.065E-28	0.0000	0.000E+00	0.0000	1.022E-21	0.0000	3.607E-22	0.0000	3.064E-22	0.0000	3.868E-24	0.0000
Eu-154	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Fe-55	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	7.215E-28	0.0000	6.879E-32	0.0000	0.000E+00	0.0000	7.033E-26	0.0000	9.247E-27	0.0000	3.753E-26	0.0000	5.315E-28	0.0000
Na-22	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Nb-94	2.442E-01	0.3887	7.870E-08	0.0000	0.000E+00	0.0000	4.365E-04	0.0007	4.283E-09	0.0000	7.421E-08	0.0000	6.612E-06	0.0000
Ni-59	0.000E+00	0.0000	8.332E-12	0.0000	0.000E+00	0.0000	1.042E-06	0.0000	5.392E-08	0.0000	7.142E-07	0.0000	3.157E-09	0.0000
Ni-63	0.000E+00	0.0000	5.795E-13	0.0000	0.000E+00	0.0000	8.547E-08	0.0000	4.423E-09	0.0000	5.858E-08	0.0000	2.590E-10	0.0000
Pu-238	9.720E-08	0.0000	4.827E-08	0.0000	0.000E+00	0.0000	1.225E-05	0.0000	3.593E-07	0.0000	2.125E-07	0.0000	1.712E-06	0.0000
Pu-239	1.323E-05	0.0000	1.399E-04	0.0002	0.000E+00	0.0000	3.717E-02	0.0592	1.055E-03	0.0017	2.435E-05	0.0000	5.624E-03	0.0090
Pu-241	9.687E-05	0.0002	7.042E-06	0.0000	0.000E+00	0.0000	1.886E-03	0.0030	2.692E-05	0.0000	2.442E-06	0.0000	2.813E-04	0.0004
[illegible]2	2.874E-06	0.0000	6.492E-05	0.0001	0.000E+00	0.0000	1.709E-02	0.0272	4.852E-04	0.0008	1.120E-05	0.0000	2.585E-03	0.0041
[illegible]0	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Tc-99	5.949E-20	0.0000	2.882E-23	0.0000	0.000E+00	0.0000	8.129E-16	0.0000	3.928E-19	0.0000	1.769E-17	0.0000	2.461E-20	0.0000
U-234	8.423E-05	0.0001	4.955E-06	0.0000	0.000E+00	0.0000	1.045E-03	0.0017	3.711E-05	0.0001	1.428E-04	0.0002	5.348E-05	0.0001
Total	2.448E-01	0.3898	2.495E-04	0.0004	0.000E+00	0.0000	6.637E-02	0.1056	1.730E-03	0.0028	1.931E-04	0.0003	9.853E-03	0.0157

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-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	6.573E-02	0.1046	1.271E-04	0.0002	0.000E+00	0.0000	3.702E-02	0.0589	4.779E-05	0.0001	1.042E-05	0.0000	1.135E-01	0.1807
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cm-243	9.345E-05	0.0001	1.807E-07	0.0000	0.000E+00	0.0000	5.263E-05	0.0001	1.323E-07	0.0000	7.393E-09	0.0000	1.977E-04	0.0003
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	1.294E-20	0.0000	1.668E-21	0.0000	0.000E+00	0.0000	7.354E-21	0.0000	5.521E-21	0.0000	8.206E-21	0.0000	4.457E-20	0.0000
Eu-154	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Fe-55	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	3.478E-24	0.0000	8.972E-27	0.0000	0.000E+00	0.0000	1.969E-24	0.0000	3.473E-25	0.0000	2.761E-24	0.0000	8.682E-24	0.0000
Na-22	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Nb-94	4.593E-04	0.0007	8.879E-06	0.0000	0.000E+00	0.0000	2.592E-04	0.0004	1.952E-09	0.0000	7.266E-08	0.0000	2.454E-01	0.3906
Ni-59	2.211E-06	0.0000	1.425E-08	0.0000	0.000E+00	0.0000	1.259E-06	0.0000	1.569E-07	0.0000	3.502E-06	0.0000	8.957E-06	0.0000
Ni-63	1.814E-07	0.0000	1.169E-09	0.0000	0.000E+00	0.0000	1.033E-07	0.0000	1.287E-08	0.0000	2.872E-07	0.0000	7.347E-07	0.0000
Pu-238	3.110E-05	0.0000	5.803E-08	0.0000	0.000E+00	0.0000	1.752E-05	0.0000	7.663E-08	0.0000	3.924E-07	0.0000	6.382E-05	0.0001
Pu-239	7.817E-02	0.1244	1.511E-04	0.0002	0.000E+00	0.0000	4.403E-02	0.0701	1.107E-04	0.0002	6.184E-06	0.0000	1.665E-01	0.2650
Pu-241	1.496E-02	0.0238	2.891E-05	0.0000	0.000E+00	0.0000	8.423E-03	0.0134	1.086E-05	0.0000	2.371E-06	0.0000	2.572E-02	0.0409
[illegible]2	2.920E-02	0.0465	5.645E-05	0.0001	0.000E+00	0.0000	1.645E-02	0.0262	4.136E-05	0.0001	2.310E-06	0.0000	6.599E-02	0.1050
S[illegible]	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Tc-99	1.020E-16	0.0000	1.315E-19	0.0000	0.000E+00	0.0000	1.202E-16	0.0000	1.582E-19	0.0000	8.675E-18	0.0000	1.062E-15	0.0000
U-234	5.834E-03	0.0093	1.154E-05	0.0000	0.000E+00	0.0000	3.288E-03	0.0052	3.178E-05	0.0001	2.710E-04	0.0004	1.080E-02	0.0172
Total	1.945E-01	0.3096	3.842E-04	0.0006	0.000E+00	0.0000	1.095E-01	0.1744	2.429E-04	0.0004	2.965E-04	0.0005	6.282E-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)	Branch Fraction*	DSR(j,t) (mrem/yr)/(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
Am-241	Am-241	1.000E+00	6.524E+00	6.509E+00	6.479E+00	6.374E+00	6.083E+00	5.165E+00	3.227E+00	5.960E-01
Am-241	Np-237	1.000E+00	7.587E-06	1.465E-05	2.874E-05	7.737E-05	2.105E-04	6.140E-04	1.343E-03	1.557E-03
Am-241	U-233	1.000E+00	8.738E-12	2.107E-11	6.466E-11	4.106E-10	2.941E-09	2.579E-08	1.405E-07	3.040E-07
Am-241	Th-229	1.000E+00	2.372E-11	2.373E-11	2.376E-11	2.387E-11	2.478E-11	4.785E-11	4.566E-10	5.811E-09
Am-241	∑DSR(j)		6.524E+00	6.509E+00	6.479E+00	6.374E+00	6.084E+00	5.166E+00	3.229E+00	5.975E-01
C-14	C-14	1.000E+00	1.471E+00	1.689E-01	1.984E-03	3.318E-10	9.626E-30	0.000E+00	0.000E+00	0.000E+00
Cm-243	Cm-243	9.976E-01	5.115E+00	4.988E+00	4.744E+00	3.980E+00	2.410E+00	4.162E-01	2.747E-03	6.170E-11
Cm-243	Pu-239	9.976E-01	8.456E-05	1.412E-04	2.497E-04	5.888E-04	1.280E-03	2.116E-03	2.115E-03	1.521E-03
Cm-243	U-235	9.976E-01	3.224E-14	9.602E-14	3.327E-13	2.209E-12	1.456E-11	9.419E-11	3.316E-10	7.154E-10
Cm-243	Pa-231	9.976E-01	2.628E-14	2.597E-14	2.627E-14	4.641E-14	4.584E-13	9.470E-12	9.220E-11	3.885E-10
Cm-243	Ac-227	9.976E-01	3.519E-14	3.454E-14	3.342E-14	3.600E-14	3.062E-13	1.345E-11	1.909E-10	8.951E-10
Cm-243	∑DSR(j)		5.115E+00	4.989E+00	4.745E+00	3.981E+00	2.411E+00	4.183E-01	4.863E-03	1.521E-03
Cm-243	Cm-243	2.400E-03	1.231E-02	1.200E-02	1.141E-02	9.576E-03	5.798E-03	1.001E-03	6.609E-06	1.484E-13
Cm-243	Am-243	2.400E-03	4.368E-05	7.276E-05	1.280E-04	2.926E-04	5.738E-04	6.033E-04	1.113E-04	1.325E-07
Cm-243	Pu-239	2.400E-03	8.444E-11	1.579E-10	3.339E-10	1.243E-09	5.576E-09	2.495E-08	4.754E-08	3.791E-08
Cm-243	U-235	2.400E-03	9.295E-19	1.182E-18	1.728E-18	4.911E-18	3.932E-17	6.739E-16	5.235E-15	1.630E-14
Cm-243	Pa-231	2.400E-03	1.425E-16	1.794E-16	2.496E-16	4.596E-16	8.119E-16	9.069E-16	1.343E-15	8.446E-15
Cm-243	Ac-227	2.400E-03	1.909E-16	2.403E-16	3.341E-16	6.149E-16	1.085E-15	1.209E-15	2.551E-15	1.935E-14
Cm-243	∑DSR(j)		1.235E-02	1.207E-02	1.154E-02	9.868E-03	6.372E-03	1.605E-03	1.179E-04	1.704E-07
Co-60	Co-60	1.000E+00	7.479E+00	6.487E+00	4.881E+00	1.803E+00	1.048E-01	4.961E-06	2.183E-18	0.000E+00
Cs-134	Cs-134	1.000E+00	3.552E+00	2.538E+00	1.295E+00	1.230E-01	1.473E-04	8.774E-15	4.624E-44	0.000E+00
Cs-137	Cs-137	1.000E+00	1.109E+01	1.054E+01	9.527E+00	6.681E+00	2.424E+00	6.973E-02	2.748E-06	1.020E-21
Eu-154	Eu-154	1.000E+00	2.877E+00	2.658E+00	2.268E+00	1.303E+00	2.671E-01	1.042E-03	1.368E-10	1.121E-34
Fe-55	Fe-55	1.000E+00	3.646E-02	2.781E-02	1.617E-02	2.427E-03	1.075E-05	6.215E-14	1.800E-37	0.000E+00
H-3	H-3	1.000E+00	7.005E-02	1.634E-02	8.749E-04	3.060E-08	4.984E-21	0.000E+00	0.000E+00	0.000E+00
I-129	I-129	1.000E+00	9.239E+01	9.759E+01	7.868E+01	5.405E+01	1.868E+01	4.323E-01	9.425E-06	4.341E-22
Na-22	Na-22	1.000E+00	7.467E+00	5.618E+00	3.180E+00	4.341E-01	1.467E-03	3.291E-12	6.392E-37	0.000E+00
Nb-94	Nb-94	1.000E+00	3.738E+00	3.736E+00	3.731E+00	3.715E+00	3.671E+00	3.519E+00	3.119E+00	2.045E+00
Ni-59	Ni-59	1.000E+00	1.171E-02	1.164E-02	1.150E-02	1.103E-02	9.779E-03	6.415E-03	1.919E-03	2.714E-05
Ni-63	Ni-63	1.000E+00	3.207E-02	3.165E-02	3.082E-02	2.810E-02	2.156E-02	8.540E-03	6.040E-04	5.487E-08

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

Parent (i)	Product (j)	Branch Fraction*	DSR(j,t) (mrem/yr)/(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
Pu-238	Pu-238	1.000E+00	1.819E+00	1.804E+00	1.775E+00	1.675E+00	1.419E+00	7.944E-01	1.511E-01	4.400E-04
Pu-238	U-234	1.000E+00	4.345E-06	7.465E-06	1.363E-05	3.429E-05	8.616E-05	2.035E-04	2.746E-04	1.284E-04
Pu-238	Th-230	1.000E+00	6.055E-12	1.109E-11	2.609E-11	1.304E-10	8.354E-10	6.864E-09	3.688E-08	1.281E-07
Pu-238	Ra-226	1.000E+00	3.973E-12	4.497E-12	7.536E-12	6.557E-11	1.248E-09	3.439E-08	5.140E-07	3.788E-06
Pu-238	Pb-210	1.000E+00	2.087E-11	2.182E-11	2.398E-11	4.397E-11	7.202E-10	4.226E-08	9.724E-07	7.859E-06
Pu-238	∑DSR(j)		1.819E+00	1.804E+00	1.775E+00	1.675E+00	1.419E+00	7.946E-01	1.514E-01	5.802E-04
Pu-239	Pu-239	1.000E+00	2.021E+00	2.020E+00	2.018E+00	2.012E+00	1.996E+00	1.938E+00	1.780E+00	1.281E+00
Pu-239	U-235	1.000E+00	1.568E-09	2.890E-09	5.533E-09	1.472E-08	4.044E-08	1.245E-07	3.191E-07	6.216E-07
Pu-239	Pa-231	1.000E+00	9.303E-12	1.618E-11	4.086E-11	2.393E-10	1.715E-09	1.568E-08	9.689E-08	3.404E-07
Pu-239	Ac-227	1.000E+00	7.561E-12	8.244E-12	1.253E-11	8.788E-11	1.354E-09	2.457E-08	2.046E-07	7.842E-07
Pu-239	∑DSR(j)		2.021E+00	2.020E+00	2.018E+00	2.012E+00	1.996E+00	1.938E+00	1.780E+00	1.281E+00
Pu-241	Pu-241	1.000E+00	3.818E-02	3.637E-02	3.301E-02	2.350E-02	8.906E-03	2.982E-04	1.816E-08	3.101E-23
Pu-241	Am-241	1.000E+00	1.477E-02	2.471E-02	4.315E-02	9.455E-02	1.688E-01	1.854E-01	1.169E-01	2.156E-02
Pu-241	Np-237	1.000E+00	8.501E-09	2.615E-08	9.254E-08	6.002E-07	3.507E-06	1.707E-05	4.380E-05	5.319E-05
Pu-241	U-233	1.000E+00	3.088E-14	5.313E-14	1.796E-13	2.346E-12	3.736E-11	6.219E-10	4.422E-09	1.052E-08
Pu-241	Th-229	1.000E+00	2.665E-13	2.927E-13	3.416E-13	4.805E-13	7.020E-13	1.308E-12	1.299E-11	1.867E-10
Pu-241	∑DSR(j)		5.295E-02	6.108E-02	7.616E-02	1.181E-01	1.777E-01	1.857E-01	1.169E-01	2.162E-02
	Pu-241	2.450E-05	9.354E-07	8.911E-07	8.087E-07	5.758E-07	2.182E-07	7.307E-09	4.448E-13	7.597E-28
Pu-241	Np-237	2.450E-05	1.846E-10	3.501E-10	6.583E-10	1.525E-09	2.826E-09	3.407E-09	2.854E-09	1.468E-09
Pu-241	U-233	2.450E-05	1.734E-16	4.754E-16	1.506E-15	8.854E-15	4.901E-14	2.218E-13	4.789E-13	3.628E-13
Pu-241	Th-229	2.450E-05	7.513E-18	8.821E-18	1.131E-17	1.916E-17	4.356E-17	2.767E-16	2.072E-15	1.075E-14
Pu-241	∑DSR(j)		9.356E-07	8.914E-07	8.093E-07	5.773E-07	2.210E-07	1.071E-08	2.855E-09	1.468E-09
Pu-242	Pu-242	1.000E+00	1.628E+00	1.627E+00	1.626E+00	1.622E+00	1.611E+00	1.571E+00	1.460E+00	1.100E+00
Pu-242	U-238	1.000E+00	2.299E-10	4.026E-10	7.475E-10	1.947E-09	5.301E-09	1.624E-08	4.130E-08	7.772E-08
Pu-242	U-234	1.000E+00	3.198E-13	3.203E-13	3.235E-13	3.486E-13	5.492E-13	2.599E-12	1.709E-11	9.378E-11
Pu-242	Th-230	1.000E+00	7.739E-13	7.735E-13	7.729E-13	7.706E-13	7.641E-13	7.414E-13	6.790E-13	4.990E-13
Pu-242	Ra-226	1.000E+00	2.000E-12	1.999E-12	1.997E-12	1.991E-12	1.974E-12	1.916E-12	1.762E-12	1.792E-12
Pu-242	Pb-210	1.000E+00	1.063E-11	1.063E-11	1.062E-11	1.059E-11	1.050E-11	1.018E-11	9.329E-12	7.595E-12
Pu-242	∑DSR(j)		1.628E+00	1.627E+00	1.626E+00	1.622E+00	1.611E+00	1.571E+00	1.460E+00	1.100E+00
Sr-90	Sr-90	1.000E+00	3.980E+01	3.700E+01	3.196E+01	1.915E+01	4.433E+00	2.645E-02	1.164E-08	6.343E-31
Tc-99	Tc-99	1.000E+00	9.682E-01	9.361E-01	8.747E-01	6.900E-01	3.503E-01	3.265E-02	3.712E-05	1.831E-15
U-234	U-234	1.000E+00	1.113E+00	1.112E+00	1.109E+00	1.100E+00	1.074E+00	9.885E-01	7.774E-01	3.216E-01
U-234	Th-230	1.000E+00	1.427E-06	2.074E-06	3.305E-06	7.593E-06	1.969E-05	6.025E-05	1.622E-04	3.963E-04
U-234	Ra-226	1.000E+00	1.430E-07	2.925E-07	8.765E-07	5.866E-06	4.428E-05	4.213E-04	2.799E-03	1.236E-02
U-234	Pb-210	1.000E+00	4.005E-07	4.147E-07	5.033E-07	2.113E-06	3.040E-05	5.991E-04	5.587E-03	2.578E-02
U-234	∑DSR(j)		1.113E+00	1.112E+00	1.109E+00	1.100E+00	1.074E+00	9.896E-01	7.860E-01	3.601E-01

*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
DSR includes contributions from associated (half-life ≤ 0.5 yr) 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
Am-241	3.832E+00	3.841E+00	3.859E+00	3.922E+00	4.109E+00	4.840E+00	7.743E+00	4.184E+01
C-14	1.700E+01	1.480E+02	1.260E+04	7.535E+10	*4.454E+12	*4.454E+12	*4.454E+12	*4.454E+12
Cm-243	4.876E+00	4.999E+00	5.256E+00	6.264E+00	1.034E+01	5.954E+01	5.020E+03	1.644E+04
Co-60	3.343E+00	3.854E+00	5.122E+00	1.386E+01	2.385E+02	5.039E+06	*1.131E+15	*1.131E+15
Cs-134	7.038E+00	9.852E+00	1.931E+01	2.033E+02	1.697E+05	*1.294E+15	*1.294E+15	*1.294E+15
Cs-137	2.254E+00	2.371E+00	2.624E+00	3.742E+00	1.031E+01	3.585E+02	9.096E+06	*8.701E+13
Eu-154	8.691E+00	9.407E+00	1.102E+01	1.919E+01	9.361E+01	2.399E+04	1.827E+11	*2.639E+14
Fe-55	6.857E+02	8.990E+02	1.546E+03	1.030E+04	2.326E+06	4.022E+14	*2.409E+15	*2.409E+15
H-3	3.569E+02	1.530E+03	2.858E+04	8.171E+08	*9.594E+15	*9.594E+15	*9.594E+15	*9.594E+15
I-129	2.706E-01	2.854E-01	3.178E-01	4.626E-01	1.353E+00	5.783E+01	2.653E+06	*1.766E+08
Na-22	3.348E+00	4.450E+00	7.861E+00	5.759E+01	1.704E+04	7.595E+12	*6.244E+15	*6.244E+15
Nb-94	6.688E+00	6.692E+00	6.701E+00	6.729E+00	6.811E+00	7.104E+00	8.015E+00	1.223E+01
Ni-59	2.134E+03	2.147E+03	2.173E+03	2.267E+03	2.556E+03	3.897E+03	1.303E+04	9.211E+05
Ni-63	7.796E+02	7.899E+02	8.111E+02	8.898E+02	1.159E+03	2.928E+03	4.139E+04	4.556E+08
Pu-238	1.374E+01	1.386E+01	1.409E+01	1.493E+01	1.762E+01	3.146E+01	1.651E+02	4.309E+04
Pu-239	1.237E+01	1.238E+01	1.239E+01	1.242E+01	1.253E+01	1.290E+01	1.405E+01	1.952E+01
Pu-241	4.722E+02	4.093E+02	3.283E+02	2.118E+02	1.407E+02	1.346E+02	2.138E+02	1.157E+03
Pu-242	1.536E+01	1.536E+01	1.537E+01	1.541E+01	1.552E+01	1.591E+01	1.712E+01	2.273E+01
Sr-90	6.282E-01	6.757E-01	7.822E-01	1.305E+00	5.639E+00	9.453E+02	2.147E+09	*1.365E+14
[illegible]	2.582E+01	2.671E+01	2.858E+01	3.623E+01	7.137E+01	7.656E+02	6.736E+05	*1.696E+10
	2.246E+01	2.249E+01	2.254E+01	2.273E+01	2.327E+01	2.526E+01	3.181E+01	6.942E+01

*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)
Am-241	1.900E-01	0.000E+00	6.524E+00	3.832E+00	6.524E+00	3.832E+00
C-14	2.000E-01	0.000E+00	1.471E+00	1.700E+01	1.471E+00	1.700E+01
Cm-243	1.300E-01	0.000E+00	5.128E+00	4.876E+00	5.128E+00	4.876E+00
Co-60	2.380E+00	0.000E+00	7.479E+00	3.343E+00	7.479E+00	3.343E+00
Cs-134	3.000E-02	0.000E+00	3.552E+00	7.038E+00	3.552E+00	7.038E+00
Cs-137	4.369E+01	0.000E+00	1.109E+01	2.254E+00	1.109E+01	2.254E+00
Eu-154	8.000E-02	0.000E+00	2.877E+00	8.691E+00	2.877E+00	8.691E+00
Fe-55	2.750E+00	0.000E+00	3.646E-02	6.857E+02	3.646E-02	6.857E+02
H-3	8.290E+00	0.000E+00	7.005E-02	3.569E+02	7.005E-02	3.569E+02
I-129	2.000E-02	0.000E+00	9.239E+01	2.706E-01	9.239E+01	2.706E-01
Na-22	3.000E-02	0.000E+00	7.467E+00	3.348E+00	7.467E+00	3.348E+00
Nb-94	1.200E-01	0.000E+00	3.738E+00	6.688E+00	3.738E+00	6.688E+00
Ni-59	3.300E-01	0.000E+00	1.171E-02	2.134E+03	1.171E-02	2.134E+03
Ni-63	1.339E+01	0.000E+00	3.207E-02	7.796E+02	3.207E-02	7.796E+02
Pu-238	1.100E-01	0.000E+00	1.819E+00	1.374E+01	1.819E+00	1.374E+01
Pu-239	1.300E-01	0.000E+00	2.021E+00	1.237E+01	2.021E+00	1.237E+01
Pu-241	1.190E+00	60.1 ± 0.1	1.955E-01	1.279E+02	5.295E-02	4.722E+02
[illegible]-242	6.000E-02	0.000E+00	1.628E+00	1.536E+01	1.628E+00	1.536E+01
[illegible]	2.543E+01	0.000E+00	3.980E+01	6.282E-01	3.980E+01	6.282E-01
Tc-99	5.800E-01	0.000E+00	9.682E-01	2.582E+01	9.682E-01	2.582E+01
U-234	3.000E-02	0.000E+00	1.113E+00	2.246E+01	1.113E+00	2.246E+01

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

Nuclide (j)	Parent (i)	BRF(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
Am-241	Am-241	1.000E+00	1.240E+00	1.237E+00	1.231E+00	1.211E+00	1.156E+00	9.814E-01	6.132E-01	1.132E-01
Am-241	Pu-241	1.000E+00	1.758E-02	2.941E-02	5.135E-02	1.125E-01	2.008E-01	2.206E-01	1.391E-01	2.566E-02
Am-241	∑DOSE(j)		1.257E+00	1.266E+00	1.282E+00	1.324E+00	1.357E+00	1.202E+00	7.523E-01	1.389E-01
Np-237	Am-241	1.000E+00	1.442E-06	2.783E-06	5.461E-06	1.470E-05	4.000E-05	1.167E-04	2.551E-04	2.958E-04
Np-237	Pu-241	1.000E+00	1.012E-08	3.112E-08	1.101E-07	7.143E-07	4.173E-06	2.031E-05	5.212E-05	6.330E-05
Np-237	Pu-241	2.450E-05	2.196E-10	4.166E-10	7.834E-10	1.815E-09	3.363E-09	4.054E-09	3.396E-09	1.747E-09
Np-237	∑DOSE(j)		1.452E-06	2.815E-06	5.572E-06	1.542E-05	4.417E-05	1.370E-04	3.073E-04	3.591E-04
U-233	Am-241	1.000E+00	1.660E-12	4.003E-12	1.229E-11	7.802E-11	5.588E-10	4.899E-09	2.670E-08	5.777E-08
U-233	Pu-241	1.000E+00	3.675E-14	6.322E-14	2.140E-13	2.792E-12	4.446E-11	7.401E-10	5.262E-09	1.252E-08
U-233	Pu-241	2.450E-05	2.063E-16	5.657E-16	1.792E-15	1.054E-14	5.833E-14	2.640E-13	5.699E-13	4.317E-13
U-233	∑DOSE(j)		1.697E-12	4.067E-12	1.250E-11	8.082E-11	6.033E-10	5.640E-09	3.196E-08	7.029E-08
Th-229	Am-241	1.000E+00	4.507E-12	4.509E-12	4.514E-12	4.536E-12	4.708E-12	9.092E-12	8.676E-11	1.104E-09
Th-229	Pu-241	1.000E+00	3.172E-13	3.484E-13	4.066E-13	5.718E-13	8.354E-13	1.557E-12	1.546E-11	2.222E-10
Th-229	Pu-241	2.450E-05	8.940E-18	1.050E-17	1.346E-17	2.280E-17	5.183E-17	3.292E-16	2.466E-15	1.279E-14
Th-229	∑DOSE(j)		4.824E-12	4.858E-12	4.920E-12	5.108E-12	5.544E-12	1.065E-11	1.022E-10	1.326E-09
C-14	C-14	1.000E+00	2.941E-01	3.379E-02	3.968E-04	6.636E-11	1.906E-30	0.000E+00	0.000E+00	0.000E+00
Cm-243	Cm-243	9.976E-01	6.650E-01	6.485E-01	6.168E-01	5.174E-01	3.133E-01	5.410E-02	3.571E-04	8.021E-12
Cm-243	Cm-243	2.400E-03	1.600E-03	1.560E-03	1.484E-03	1.245E-03	7.537E-04	1.302E-04	8.592E-07	1.930E-14
Cm-243	∑DOSE(j)		6.666E-01	6.501E-01	6.182E-01	5.187E-01	3.141E-01	5.423E-02	3.580E-04	8.040E-12
Pu-239	Cm-243	9.976E-01	1.099E-05	1.835E-05	3.246E-05	7.654E-05	1.665E-04	2.751E-04	2.750E-04	1.977E-04
Pu-239	Cm-243	2.400E-03	1.098E-11	2.052E-11	4.340E-11	1.616E-10	7.249E-10	3.243E-09	6.180E-09	4.929E-09
Pu-239	Pu-239	1.000E+00	2.627E-01	2.626E-01	2.624E-01	2.616E-01	2.594E-01	2.520E-01	2.314E-01	1.665E-01
Pu-239	∑DOSE(j)		2.627E-01	2.626E-01	2.624E-01	2.617E-01	2.596E-01	2.523E-01	2.317E-01	1.667E-01
U-235	Cm-243	9.976E-01	4.191E-15	1.248E-14	4.325E-14	2.872E-13	1.892E-12	1.224E-11	4.311E-11	9.300E-11
U-235	Cm-243	2.400E-03	1.208E-19	1.537E-19	2.246E-19	6.365E-19	5.111E-18	8.761E-17	6.805E-16	2.119E-15
U-235	Pu-239	1.000E+00	2.038E-10	3.757E-10	7.192E-10	1.914E-09	5.257E-09	1.619E-08	4.149E-08	8.080E-08
U-235	∑DOSE(j)		2.038E-10	3.757E-10	7.193E-10	1.914E-09	5.259E-09	1.620E-08	4.153E-08	8.090E-08
Pa-231	Cm-243	9.976E-01	3.417E-15	3.376E-15	3.416E-15	6.034E-15	5.959E-14	1.231E-12	1.199E-11	5.050E-11
Pa-231	Cm-243	2.400E-03	1.853E-17	2.333E-17	3.244E-17	5.974E-17	1.055E-16	1.179E-16	1.745E-16	1.098E-15
Pa-231	Pu-239	1.000E+00	1.209E-12	2.104E-12	5.312E-12	3.111E-11	2.230E-10	2.038E-09	1.260E-08	4.425E-08
Pa-231	∑DOSE(j)		1.213E-12	2.107E-12	5.315E-12	3.111E-11	2.230E-10	2.040E-09	1.261E-08	4.430E-08
Ac-227	Cm-243	9.976E-01	4.575E-15	4.490E-15	4.345E-15	4.680E-15	3.980E-14	1.748E-12	2.482E-11	1.164E-10
Ac-227	Cm-243	2.400E-03	2.481E-17	3.124E-17	4.343E-17	7.994E-17	1.411E-16	1.571E-16	3.317E-16	2.516E-15
Ac-227	Pu-239	1.000E+00	9.829E-13	1.072E-12	1.629E-12	1.142E-11	1.760E-10	3.194E-09	2.660E-08	1.019E-07
Ac-227	∑DOSE(j)		9.875E-13	1.076E-12	1.633E-12	1.143E-11	1.760E-10	3.195E-09	2.663E-08	1.021E-07
[illegible]3	Cm-243	2.400E-03	5.679E-06	9.459E-06	1.664E-05	3.804E-05	7.459E-05	7.843E-05	1.446E-05	1.723E-08
Co-60	Co-60	1.000E+00	1.780E+01	1.544E+01	1.162E+01	4.291E+00	2.494E-01	1.181E-05	5.195E-18	0.000E+00

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

Nuclide (j)	Parent (i)	BRF(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-134	Cs-134	1.000E+00	1.066E-01	7.613E-02	3.885E-02	3.689E-03	4.420E-06	2.632E-16	0.000E+00	0.000E+00
Cs-137	Cs-137	1.000E+00	4.645E+02	4.607E+02	4.162E+02	2.919E+02	1.059E+02	3.046E+00	1.201E-04	4.457E-20
Eu-154	Eu-154	1.000E+00	2.301E-01	2.126E-01	1.814E-01	1.042E-01	2.137E-02	8.338E-05	1.095E-11	0.000E+00
Fe-55	Fe-55	1.000E+00	1.003E-01	7.647E-02	4.448E-02	6.674E-03	2.956E-05	1.709E-13	0.000E+00	0.000E+00
H-3	H-3	1.000E+00	5.807E-01	1.355E-01	7.253E-03	2.536E-07	4.132E-20	0.000E+00	0.000E+00	0.000E+00
I-129	I-129	1.000E+00	1.848E+00	1.752E+00	1.574E+00	1.081E+00	3.697E-01	8.645E-03	1.885E-07	8.682E-24
Na-22	Na-22	1.000E+00	2.240E-01	1.685E-01	9.541E-02	1.302E-02	4.401E-05	9.874E-14	0.000E+00	0.000E+00
Nb-94	Nb-94	1.000E+00	4.485E-01	4.483E-01	4.477E-01	4.458E-01	4.405E-01	4.223E-01	3.743E-01	2.454E-01
Ni-59	Ni-59	1.000E+00	3.865E-03	3.842E-03	3.796E-03	3.640E-03	3.227E-03	2.117E-03	6.334E-04	8.957E-06
Ni-63	Ni-63	1.000E+00	4.294E-01	4.238E-01	4.127E-01	3.762E-01	2.888E-01	1.143E-01	8.087E-03	7.347E-07
8	Pu-238	1.000E+00	2.001E-01	1.985E-01	1.952E-01	1.842E-01	1.561E-01	8.738E-02	1.662E-02	4.840E-05
U-234	Pu-238	1.000E+00	4.779E-07	8.211E-07	1.499E-06	3.771E-06	9.477E-06	2.238E-05	3.020E-05	1.412E-05
U-234	Pu-242	1.000E+00	1.919E-14	1.922E-14	1.941E-14	2.092E-14	3.295E-14	1.560E-13	1.026E-12	5.627E-12
U-234	U-234	1.000E+00	3.339E-02	3.335E-02	3.327E-02	3.300E-02	3.223E-02	2.965E-02	2.332E-02	9.648E-03
U-234	∑DOSE(j)		3.339E-02	3.335E-02	3.327E-02	3.300E-02	3.223E-02	2.968E-02	2.335E-02	9.662E-03
Th-230	Pu-238	1.000E+00	6.660E-13	1.220E-12	2.870E-12	1.434E-11	9.189E-11	7.551E-10	4.056E-09	1.409E-08
Th-230	Pu-242	1.000E+00	4.643E-14	4.641E-14	4.637E-14	4.624E-14	4.584E-14	4.448E-14	4.074E-14	2.994E-14
Th-230	U-234	1.000E+00	4.282E-08	6.222E-08	9.914E-08	2.278E-07	5.906E-07	1.808E-06	4.867E-06	1.189E-05
Th-230	∑DOSE(j)		4.282E-08	6.222E-08	9.914E-08	2.278E-07	5.907E-07	1.808E-06	4.871E-06	1.190E-05
Ra-226	Pu-238	1.000E+00	4.371E-13	4.947E-13	8.289E-13	7.212E-12	1.372E-10	3.783E-09	5.654E-08	4.166E-07
Ra-226	Pu-242	1.000E+00	1.200E-13	1.199E-13	1.198E-13	1.195E-13	1.185E-13	1.150E-13	1.057E-13	1.075E-13
Ra-226	U-234	1.000E+00	4.291E-09	8.775E-09	2.629E-08	1.760E-07	1.328E-06	1.264E-05	8.396E-05	3.709E-04
Ra-226	∑DOSE(j)		4.291E-09	8.776E-09	2.630E-08	1.760E-07	1.328E-06	1.264E-05	8.402E-05	3.713E-04
Pb-210	Pu-238	1.000E+00	2.295E-12	2.400E-12	2.637E-12	4.836E-12	7.922E-11	4.649E-09	1.070E-07	8.645E-07
Pb-210	Pu-242	1.000E+00	6.378E-13	6.376E-13	6.370E-13	6.351E-13	6.298E-13	6.111E-13	5.598E-13	4.557E-13
Pb-210	U-234	1.000E+00	1.202E-08	1.244E-08	1.510E-08	6.340E-08	9.120E-07	1.797E-05	1.676E-04	7.735E-04
Pb-210	∑DOSE(j)		1.202E-08	1.244E-08	1.510E-08	6.340E-08	9.121E-07	1.798E-05	1.677E-04	7.744E-04
Pu-241	Pu-241	1.000E+00	4.543E-02	4.328E-02	3.928E-02	2.797E-02	1.060E-02	3.549E-04	2.161E-08	3.690E-23
Pu-241	Pu-241	2.450E-05	1.113E-06	1.060E-06	9.623E-07	6.852E-07	2.597E-07	8.695E-09	5.294E-13	9.014E-28
Pu-241	∑DOSE(j)		4.543E-02	4.328E-02	3.928E-02	2.797E-02	1.060E-02	3.549E-04	2.161E-08	3.690E-23
2	Pu-242	1.000E+00	9.767E-02	9.763E-02	9.756E-02	9.733E-02	9.664E-02	9.426E-02	8.762E-02	6.599E-02
U-238	Pu-242	1.000E+00	1.380E-11	2.415E-11	4.485E-11	1.168E-10	3.181E-10	9.744E-10	2.478E-09	4.663E-09

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

Nuclide (j)	Parent (i)	BRF(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
Sr-90	Sr-90	1.000E+00	1.012E+03	9.408E+02	8.128E+02	4.870E+02	1.127E+02	6.725E-01	2.960E-07	0.000E+00
Tc-99	Tc-99	1.000E+00	5.616E-01	5.429E-01	5.073E-01	4.002E-01	2.032E-01	1.894E-02	2.153E-05	1.062E-15

BRF(i) is the branch fraction of the parent nuclide.

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	BRF(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
Am-241	Am-241	1.000E+00	1.900E-01	1.896E-01	1.889E-01	1.862E-01	1.788E-01	1.553E-01	1.037E-01	2.525E-02
Am-241	Pu-241	1.000E+00	0.000E+00	1.861E-03	5.314E-03	1.498E-02	2.915E-02	3.340E-02	2.253E-02	5.485E-03
Am-241	∑S(j):		1.900E-01	1.915E-01	1.942E-01	2.012E-01	2.080E-01	1.887E-01	1.262E-01	3.073E-02
Np-237	Am-241	1.000E+00	0.000E+00	6.146E-08	1.839E-07	6.071E-07	1.772E-06	5.371E-06	1.233E-05	1.681E-05
Np-237	Pu-241	1.000E+00	0.000E+00	3.039E-10	2.645E-09	2.623E-08	1.759E-07	9.074E-07	2.451E-06	3.514E-06
Np-237	Pu-241	2.450E-05	0.000E+00	9.216E-12	2.635E-11	7.462E-11	1.477E-10	1.833E-10	1.602E-10	9.702E-11
Np-237	∑S(j):		0.000E+00	6.177E-08	1.865E-07	6.334E-07	1.948E-06	6.279E-06	1.478E-05	2.032E-05
U-233	Am-241	1.000E+00	0.000E+00	1.343E-13	1.203E-12	1.317E-11	1.136E-10	1.089E-09	6.483E-09	1.893E-08
U-233	Pu-241	1.000E+00	0.000E+00	4.444E-16	1.168E-14	3.945E-13	8.347E-12	1.563E-10	1.221E-09	3.921E-09
U-233	Pu-241	2.450E-05	0.000E+00	2.029E-17	1.764E-16	1.743E-15	1.154E-14	5.666E-14	1.328E-13	1.354E-13
U-233	∑S(j):		0.000E+00	1.347E-13	1.215E-12	1.357E-11	1.220E-10	1.245E-09	7.704E-09	2.285E-08
Th-229	Am-241	1.000E+00	0.000E+00	4.229E-18	1.138E-16	4.168E-15	1.089E-13	3.606E-12	7.136E-11	9.907E-10
Th-229	Pu-241	1.000E+00	0.000E+00	1.052E-20	8.339E-19	9.560E-17	6.355E-15	4.457E-13	1.249E-11	1.990E-10
Th-229	Pu-241	2.450E-05	0.000E+00	6.415E-22	1.688E-20	5.720E-19	1.223E-17	2.386E-16	2.127E-15	1.150E-14
Th-229	∑S(j):		0.000E+00	4.240E-18	1.147E-16	4.264E-15	1.153E-13	4.052E-12	8.386E-11	1.190E-09
C-14	C-14	1.000E+00	2.000E-01	2.172E-02	2.552E-04	4.278E-11	1.250E-30	0.000E+00	0.000E+00	0.000E+00
Cm-243	Cm-243	9.976E-01	1.297E-01	1.265E-01	1.204E-01	1.012E-01	6.166E-02	1.088E-02	7.657E-05	2.239E-12
Cm-243	Cm-243	2.400E-03	3.120E-04	3.044E-04	2.896E-04	2.435E-04	1.483E-04	2.617E-05	1.842E-07	5.387E-15
Cm-243	∑S(j):		1.300E-01	1.268E-01	1.207E-01	1.015E-01	6.181E-02	1.091E-02	7.676E-05	2.245E-12
Pu-239	Cm-243	9.976E-01	0.000E+00	3.689E-06	1.080E-05	3.306E-05	7.887E-05	1.367E-04	1.452E-04	1.315E-04
Pu-239	Cm-243	2.400E-03	0.000E+00	4.173E-13	3.671E-12	3.771E-11	2.731E-10	1.529E-09	3.245E-09	3.278E-09
Pu-239	Pu-239	1.000E+00	1.300E-01	1.300E-01	1.299E-01	1.298E-01	1.294E-01	1.282E-01	1.246E-01	1.127E-01
Pu-239	∑S(j):		1.300E-01	1.300E-01	1.300E-01	1.298E-01	1.295E-01	1.283E-01	1.247E-01	1.129E-01
U-235	Cm-243	9.976E-01	0.000E+00	1.824E-15	1.614E-14	1.691E-13	1.297E-12	8.997E-12	3.375E-11	8.939E-11
U-235	Cm-243	2.400E-03	0.000E+00	1.373E-22	3.644E-21	1.271E-19	2.902E-18	6.319E-17	5.315E-16	2.036E-15
U-235	Pu-239	1.000E+00	0.000E+00	1.280E-10	3.635E-10	1.274E-09	3.783E-09	1.217E-08	3.306E-08	7.890E-08
U-235	∑S(j):		0.000E+00	1.280E-10	3.635E-10	1.274E-09	3.784E-09	1.218E-08	3.310E-08	7.899E-08
Pa-231	Cm-243	9.976E-01	0.000E+00	1.288E-20	3.426E-19	1.206E-17	2.833E-16	6.795E-15	7.255E-14	4.057E-13
Pa-231	Cm-243	2.400E-03	0.000E+00	7.272E-28	5.800E-26	6.787E-24	4.735E-22	3.599E-20	9.339E-19	8.817E-18
Pa-231	Pu-239	1.000E+00	0.000E+00	1.352E-15	1.213E-14	1.333E-13	1.163E-12	1.161E-11	7.810E-11	3.636E-10
Pa-231	∑S(j):		0.000E+00	1.352E-15	1.213E-14	1.334E-13	1.164E-12	1.162E-11	7.817E-11	3.640E-10
Ac-227	Cm-243	9.976E-01	0.000E+00	1.018E-22	8.019E-21	8.988E-19	5.586E-17	3.067E-15	4.835E-14	3.078E-13
Ac-227	Cm-243	2.400E-03	0.000E+00	4.605E-30	1.090E-27	4.092E-25	7.720E-23	1.426E-20	5.925E-19	6.652E-18
Ac-227	Pu-239	1.000E+00	0.000E+00	1.421E-17	3.751E-16	1.286E-14	2.824E-13	5.803E-12	5.318E-11	2.763E-10
Ac-227	∑S(j):		0.000E+00	1.421E-17	3.751E-16	1.286E-14	2.825E-13	5.806E-12	5.323E-11	2.766E-10
Co-60	Cm-243	2.400E-03	0.000E+00	2.881E-08	8.355E-08	2.475E-07	5.328E-07	5.915E-07	1.178E-07	1.891E-10
Co-60	Co-60	1.000E+00	2.380E+00	2.065E+00	1.554E+00	5.742E-01	3.341E-02	1.589E-06	7.080E-19	0.000E+00

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	BRF(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-134	Cs-134	1.000E+00	3.000E-02	2.143E-02	1.094E-02	1.039E-03	1.245E-06	7.416E-17	0.000E+00	0.000E+00
Cs-137	Cs-137	1.000E+00	4.369E+01	4.154E+01	3.756E+01	2.639E+01	9.631E+00	2.827E-01	1.184E-05	5.629E-21
Eu-154	Eu-154	1.000E+00	8.000E-02	7.391E-02	6.308E-02	3.622E-02	7.427E-03	2.899E-05	3.807E-12	3.125E-36
Fe-55	Fe-55	1.000E+00	2.750E+00	2.098E+00	1.221E+00	1.836E-01	8.188E-04	4.848E-12	1.507E-35	0.000E+00
H-3	H-3	1.000E+00	8.290E+00	1.921E+00	1.029E-01	3.614E-06	5.957E-19	0.000E+00	0.000E+00	0.000E+00
I-129	I-129	1.000E+00	2.000E-02	1.896E-02	1.704E-02	1.174E-02	4.040E-03	9.675E-05	2.264E-09	1.404E-25
Na-22	Na-22	1.000E+00	3.000E-02	2.257E-02	1.278E-02	1.746E-03	5.916E-06	1.339E-14	2.666E-39	0.000E+00
Nb-94	Nb-94	1.000E+00	1.200E-01	1.199E-01	1.198E-01	1.193E-01	1.179E-01	1.130E-01	1.002E-01	6.574E-02
Ni-59	Ni-59	1.000E+00	3.300E-01	3.281E-01	3.244E-01	3.116E-01	2.779E-01	1.860E-01	5.912E-02	1.070E-03
Ni-63	Ni-63	1.000E+00	1.339E+01	1.322E+01	1.288E+01	1.176E+01	9.081E+00	3.670E+00	2.758E-01	3.206E-05
[illegible]8	Pu-238	1.000E+00	1.100E-01	1.091E-01	1.074E-01	1.015E-01	8.649E-02	4.936E-02	9.938E-03	3.640E-05
U-234	Pu-238	1.000E+00	0.000E+00	3.105E-07	9.232E-07	2.984E-06	8.204E-06	2.043E-05	2.967E-05	1.823E-05
U-234	Pu-242	1.000E+00	0.000E+00	1.319E-17	1.185E-16	1.311E-15	1.166E-14	1.241E-13	9.898E-13	7.279E-12
U-234	U-234	1.000E+00	3.000E-02	2.997E-02	2.992E-02	2.974E-02	2.922E-02	2.749E-02	2.309E-02	1.254E-02
U-234	ΣS(j):		3.000E-02	2.997E-02	2.992E-02	2.974E-02	2.923E-02	2.751E-02	2.312E-02	1.255E-02
Th-230	Pu-238	1.000E+00	0.000E+00	1.399E-12	1.252E-11	1.363E-10	1.157E-09	1.060E-08	5.905E-08	2.119E-07
Th-230	Pu-242	1.000E+00	0.000E+00	3.957E-23	1.067E-21	3.941E-20	1.054E-18	3.781E-17	9.320E-16	2.536E-14
Th-230	U-234	1.000E+00	0.000E+00	2.699E-07	8.091E-07	2.689E-06	7.995E-06	2.585E-05	7.115E-05	1.789E-04
Th-230	ΣS(j):		0.000E+00	2.699E-07	8.091E-07	2.689E-06	7.996E-06	2.586E-05	7.121E-05	1.791E-04
Ra-226	Pu-238	1.000E+00	0.000E+00	2.021E-16	5.424E-15	1.967E-13	5.007E-12	1.517E-10	2.418E-09	2.117E-08
Ra-226	Pu-242	1.000E+00	0.000E+00	4.284E-27	3.463E-25	4.246E-23	3.373E-21	3.891E-19	2.610E-17	1.758E-15
Ra-226	U-234	1.000E+00	0.000E+00	5.842E-11	5.244E-10	5.773E-09	5.062E-08	5.139E-07	3.613E-06	1.892E-05
Ra-226	ΣS(j):		0.000E+00	5.842E-11	5.244E-10	5.774E-09	5.062E-08	5.141E-07	3.615E-06	1.894E-05
Pb-210	Pu-238	1.000E+00	0.000E+00	1.561E-18	1.242E-16	1.442E-14	9.852E-13	7.151E-11	1.817E-09	1.920E-08
Pb-210	Pu-242	1.000E+00	0.000E+00	2.649E-29	6.357E-27	2.505E-24	5.408E-22	1.546E-19	1.747E-17	1.509E-15
Pb-210	U-234	1.000E+00	0.000E+00	6.005E-13	1.592E-11	5.537E-10	1.261E-08	2.823E-07	2.875E-06	1.729E-05
Pb-210	ΣS(j):		0.000E+00	6.005E-13	1.592E-11	5.538E-10	1.261E-08	2.824E-07	2.876E-06	1.731E-05
Pu-241	Pu-241	1.000E+00	1.190E+00	1.134E+00	1.030E+00	7.345E-01	2.798E-01	9.553E-03	6.156E-07	1.322E-21
Pu-241	Pu-241	2.450E-05	2.916E-05	2.778E-05	2.523E-05	1.800E-05	6.856E-06	2.340E-07	1.508E-11	3.240E-26
Pu-241	ΣS(j):		1.190E+00	1.134E+00	1.030E+00	7.345E-01	2.798E-01	9.553E-03	6.156E-07	1.322E-21
[illegible]	Pu-242	1.000E+00	6.000E-02	5.999E-02	5.998E-02	5.994E-02	5.983E-02	5.944E-02	5.833E-02	5.461E-02
U-238	Pu-242	1.000E+00	0.000E+00	9.304E-12	2.788E-11	9.263E-11	2.752E-10	8.872E-10	2.422E-09	5.894E-09

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	BRF(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
Sr-90	Sr-90	1.000E+00	2.543E+01	2.364E+01	2.044E+01	1.227E+01	2.857E+00	1.741E-02	8.161E-09	5.754E-31
Tc-99	Tc-99	1.000E+00	5.800E-01	5.607E-01	5.241E-01	4.137E-01	2.104E-01	1.975E-02	2.290E-05	1.216E-15

BRF(i) is the branch fraction of the parent nuclide.

RESCALC.EXE execution time = 23.72 seconds

RESRAD-BUILD Table of Contents

RESRAD-BUILD Input Parameters

Number of Sources : 6
Number of Receptors: 1
Total Time : 3.652500E+02 days
Fraction Inside : 2.670000E-01

Receptor Information

Receptor	Room	x (m)	y (m)	z (m)	FracTime	Inhalation (m3/day)	Ingestion(Dust) (m2/hr)
1	1	7.500	2.500	1.000	1.000	3.36E+01	0.00E+00

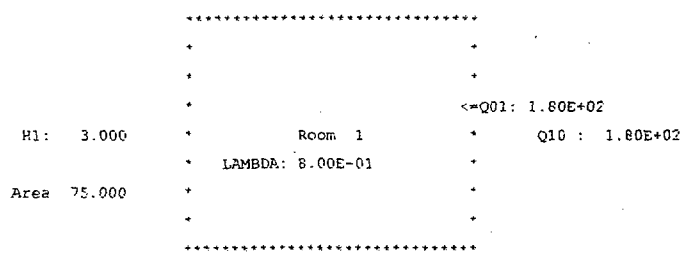
Receptor-Source Shielding Relationship

Receptor	Source	Density (g/cm3)	Thickness (cm)	Material
1	1	2.40E+00	0.00E+00	Concrete
1	2	2.40E+00	0.00E+00	Concrete
1	3	2.40E+00	0.00E+00	Concrete
1	4	2.40E+00	0.00E+00	Concrete
1	5	2.40E+00	0.00E+00	Concrete
1	6	2.40E+00	0.00E+00	Concrete

======== Building Information ========

Building Air Exchange Rate: 8.00E-01 1/hr

Height(m) Air Exchanges (m3/hr)
Area (m2)



Deposition velocity: 2.70E-06 (m/s) Resuspension Rate: 1.40E-05 (1/s)

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th ROLESMEARMIX Rev 0.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 0.00 y: 2.50 z: 1.50[m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration [pCi/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity) Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/(pCi/m3)]
FE-55	1.000E-10	6.070E-07	2.690E-06	0.000E+00

Source: 2
Location:: Room : 1 x: 15.00 y: 2.50 z: 1.50[m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration [pCi/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity) Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/(pCi/m3)]
FE-55	1.000E-10	6.070E-07	2.690E-06	0.000E+00

Source: 3

Location:: Room : 1 x: 7.50 y: 0.00 z: 1.50[m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration [pCi/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/(pCi/m3)]
FE-55	1.000E-10	6.070E-07	2.690E-06	0.000E+00

Source: 4

Location:: Room : 1 x: 7.50 y: 5.00 z: 1.50[m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration [pCi/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/(pCi/m3)]
FE-55	1.000E-10	6.070E-07	2.690E-06	0.000E+00

Source: 5

Location:: Room : 1 x: 7.50 y: 2.50 z: 0.00[m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Radon Release Fraction: 0.000E+00

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
	[pCi/m2]	Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/ (pCi/m3)]
CM-243	1.000E-02	2.510E-03	3.070E-01	6.880E-04
PU-241	4.500E-01	6.850E-05	8.250E-03	2.560E-08
AM-241	2.000E-02	3.640E-03	4.440E-01	9.570E-05
PU-239	2.000E-02	3.540E-03	4.290E-01	4.960E-07
NP-237	5.000E-02	4.440E-03	5.400E-01	1.210E-03
U-238	4.200E-01	2.690E-04	1.180E-01	1.600E-04
U-235	1.120E+00	2.670E-04	1.230E-01	9.030E-04
U-234	3.190E+01	2.830E-04	1.320E-01	8.930E-07
U-233	0.000E+00	2.890E-04	1.350E-01	1.910E-06
PA-231	0.000E+00	1.060E-02	1.280E+00	2.010E-04
TH-230	0.000E+00	5.480E-04	3.260E-01	2.040E-06
TH-229	0.000E+00	4.030E-03	2.160E+00	1.720E-03
AC-227	0.000E+00	1.480E-02	6.720E+00	2.160E-03
RA-226	0.000E+00	1.330E-03	8.600E-03	1.040E-02
PB-210	0.000E+00	5.370E-03	1.380E-02	1.050E-05
EU-155	1.200E-01	1.530E-06	4.140E-05	2.910E-04
SB-125	2.300E-01	2.810E-06	1.220E-05	2.360E-03
TC-99	3.000E-01	1.460E-06	8.330E-06	1.900E-07
SR-90	4.030E+00	1.530E-04	1.310E-03	2.310E-05
NI-63	2.300E-01	5.770E-07	6.290E-06	0.000E+00
NI-59	1.680E+00	2.100E-07	2.700E-06	0.000E+00
C-14	2.600E-01	2.090E-06	2.090E-06	2.620E-08

Source: 6

Location:: Room : 1 x: 7.50 y: 2.50 z: 3.00[m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.07OE-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor [Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
FE-55	1.000E-10	6.070E-07	2.690E-06	0.000E+00

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th ROLBSMEARMIX Rev 0.bld
Evaluation Time: 0.00000000E+00 years

==========
==========
=== Assessment for Time: 1 ===
=== Time =0.00E+00 yr ===
==========
==========

======== Source Information ========

Source: 1
Location:: Room : 1 x: 0.00 y: 2.50 z: 1.50 [m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	FE-55	1.000E-10

Source: 2
Location:: Room : 1 x: 15.00 y: 2.50 z: 1.50 [m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	FE-55	1.000E-10

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th ROLBSMEARMIX Rev 0.bld
Evaluation Time: 0.00000000E+00 years

Source: 3
Location:: Room : 1 x: 7.50 y: 0.00 z: 1.50 [m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	FE-55	1.000E-10

Source: 4
Location:: Room : 1 x: 7.50 y: 5.00 z: 1.50 [m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	FE-55	1.000E-10

Source: 5
Location:: Room : 1 x: 7.50 y: 2.50 z: 0.00 [m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	CM-243	1.000E-02
	PU-241	4.500E-01

AM-241	2.000E-02
PU-239	2.000E-02
NP-237	5.000E-02
U-238	4.200E-01
U-235	1.120E+00
U-234	3.190E+01
U-233	0.000E+00
PA-231	0.000E+00
TH-230	0.000E+00
TH-229	0.000E+00
AC-227	0.000E+00
RA-226	0.000E+00
PB-210	0.000E+00
EU-155	1.200E-01
SB-125	2.300E-01
TC-99	3.000E-01
SR-90	4.030E+00
NI-63	2.300E-01
NI-59	1.680E+00
C-14	2.600E-01

Source: 6
Location:: Room : 1 x: 7.50 y: 2.50 z: 3.00 [m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	FE-55	1.000E-10

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th ROLBSMEARMIX Rev 0.bld
Evaluation Time: 0.00000000E+00 years

RESRAD-BUILDDose Tables

Source Contributions to Receptor Doses

(mrem)

	Source 1	Source 2	Source 3	Source 4	Source 5	Source 6	Total
Receptor 1	7.68E-20	7.68E-20	2.30E-19	2.30E-19	1.75E-04	3.84E-19	1.75E-04
Total	7.68E-20	7.68E-20	2.30E-19	2.30E-19	1.75E-04	3.84E-19	1.75E-04

Pathway Detail of Doses

(mrem)

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	1.04E-21	0.00E+00	7.58E-20
Total	0.00E+00	0.00E+00	0.00E+00	1.04E-21	0.00E+00	7.58E-20

Source: 2

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	1.04E-21	0.00E+00	7.58E-20
Total	0.00E+00	0.00E+00	0.00E+00	1.04E-21	0.00E+00	7.58E-20

Source: 3

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	3.11E-21	0.00E+00	2.27E-19
Total	0.00E+00	0.00E+00	0.00E+00	3.11E-21	0.00E+00	2.27E-19

Source: 4

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	3.11E-21	0.00E+00	2.27E-19
Total	0.00E+00	0.00E+00	0.00E+00	3.11E-21	0.00E+00	2.27E-19

Source: 5

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	3.82E-06	4.93E-15	3.18E-12	9.75E-05	3.63E-20	7.41E-05
Total	3.82E-06	4.93E-15	3.18E-12	9.75E-05	3.63E-20	7.41E-05

Source: 6

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	5.19E-21	0.00E+00	3.79E-19
Total	0.00E+00	0.00E+00	0.00E+00	5.19E-21	0.00E+00	3.79E-19

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th ROLBSMEARMIX Rev 0.bld
Evaluation Time: 0.00000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor 1	Total
FE-55		
FE-55	7.68E-20	7.68E-20

Source: 2

Nuclide	Receptor 1	Total
FE-55		
FE-55	7.68E-20	7.68E-20

Source: 3

Nuclide	Receptor 1	Total
FE-55		
FE-55	2.30E-19	2.30E-19

Source: 4

Nuclide	Receptor 1	Total
FE-55		
FE-55	2.30E-19	2.30E-19

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th ROLBSMEARMIX Rev 0.bld
Evaluation Time: 0.00000000E+00 years

Source: 5

Nuclide	Receptor 1	Total
CM-243		
CM-243	2.54E-07	2.54E-07
PU-239	4.92E-12	4.92E-12
U-235	2.93E-22	2.93E-22
PA-231	2.57E-26	2.57E-26
AC-227	4.03E-28	4.03E-28
PU-241		
PU-241	2.92E-07	2.92E-07
AM-241	1.27E-08	1.27E-08
NP-237	1.75E-15	1.75E-15
U-233	2.11E-22	2.11E-22
TH-229	6.31E-26	6.31E-26
AM-241		
AM-241	7.16E-07	7.16E-07
NP-237	1.47E-13	1.47E-13
U-233	2.36E-20	2.36E-20
TH-229	8.79E-24	8.79E-24
PU-239		
PU-239	6.89E-07	6.89E-07
U-235	6.14E-17	6.14E-17
PA-231	7.17E-21	7.17E-21
AC-227	1.40E-22	1.40E-22
NP-237		
NP-237	2.27E-06	2.27E-06
U-233	5.47E-13	5.47E-13
TH-229	2.71E-16	2.71E-16
U-238		
U-238	2.02E-06	2.02E-06
U-234	2.92E-12	2.92E-12
TH-230	1.97E-17	1.97E-17
RA-226	4.89E-21	4.89E-21
PB-210	4.57E-23	4.57E-23
U-235		
U-235	6.99E-06	6.99E-06
PA-231	1.22E-09	1.22E-09
AC-227	3.18E-11	3.18E-11
U-234		
U-234	1.57E-04	1.57E-04
TH-230	1.58E-09	1.58E-09
RA-226	5.24E-13	5.24E-13
PB-210	6.10E-15	6.10E-15
EU-155		
EU-155	6.90E-08	6.90E-08
SB-125		
SB-125	8.66E-07	8.66E-07
TC-99	3.37E-09	3.37E-09
SR-90		

SR-90	4.64E-06	4.64E-06
NI-63		
NI-63	9.67E-10	9.67E-10
NI-59		
NI-59	2.59E-09	2.59E-09
C-14		
C-14	3.91E-09	3.91E-09

Source: 6

Nuclide	Receptor I	Total
FE-55		
FE-55	3.84E-19	3.84E-19

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th ROLBSMEARMIX Rev 0.bld

Summary

RESRAD-BUILD Dose (Time) Tables

Receptor Dose Received for the Exposure Duration

(mrem)

	Evaluation Time (yr)
	0.00E+00
1	1.75E-04

Receptor Dose/Yr Averaged Over Exposure Duration

(mrem/yr)

	Evaluation Time (yr)
	0.00E+00
1	1.75E-04

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th ROLESMEARMIX Rev 0.bld

RESRAD-BUILD Table of Contents

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th ROLESMEARMIX Rev 0.bid

RESRAD-BUILD Input Parameters

Number of Sources : 6
Number of Receptors: 1
Total Time : 3.652500E+02 days
Fraction Inside : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	7.500	2.500	1.000	1.000	3.36E+01	0.00E+00

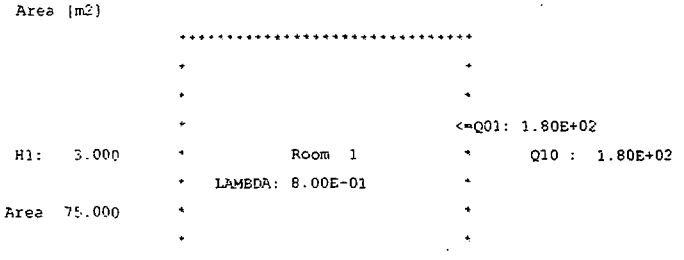
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete
1	2	2.40E+00	0.00E+00	Concrete
1	3	2.40E+00	0.00E+00	Concrete
1	4	2.40E+00	0.00E+00	Concrete
1	5	2.40E+00	0.00E+00	Concrete
1	6	2.40E+00	0.00E+00	Concrete

========== Building Information ==========

Building Air Exchange Rate: 8.00E-01 1/hr

Height [m] Air Exchanges [m3/hr]
Area [m2]



Deposition velocity: 2.70E-06 [m/s] Resuspension Rate: 1.40E-05 [1/s]

======== Source Information ========

Source: 1

Location:: Room : 1 x: 0.00 y: 2.50 z: 1.50[m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::

Nuclide	Concentration [pCi/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity) Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/(pCi/m3)]
EU-154	1.000E-10	9.550E-06	2.860E-04	7.180E-03

Source: 2

Location:: Room : 1 x: 15.00 y: 2.50 z: 1.50[m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::

Nuclide	Concentration [pCi/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity) Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/(pCi/m3)]
EU-154	1.000E-10	9.550E-06	2.860E-04	7.180E-03

Source: 3

Location:: Room : 1 x: 7.50 y: 0.00 z: 1.50[m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
EU-154	1.000E-10	9.550E-06	2.860E-04	7.180E-03

Source: 4

Location:: Room : 1 x: 7.50 y: 5.00 z: 1.50[m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
EU-154	1.000E-10	9.550E-06	2.860E-04	7.180E-03

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th ROLBSMEARMIX Rev 0.bld

Source: 5
Location:: Room : 1 x: 7.50 y: 2.50 z: 0.00[m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::

Nuclide	Concentration [pCi/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity) Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/(pCi/m3)]
CS-137	1.660E+01	5.000E-05	3.190E-05	3.190E-03
I-129	2.660E+00	2.760E-04	1.740E-04	4.450E-05
NB-94	5.000E-02	7.140E-06	4.140E-04	9.010E-03
CO-60	9.800E-01	2.690E-05	2.190E-04	1.470E-02

Source: 6
Location:: Room : 1 x: 7.50 y: 2.50 z: 3.00[m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::

Nuclide	Concentration [pCi/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity) Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/(pCi/m3)]
EU-154	1.000E-10	9.550E-06	2.860E-04	7.180E-03

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th ROLBSMEARMIX Rev 0.bld
Evaluation Time: 0.00000000E+00 years

==========
==========
=== Assessment for Time: 1 ===
=== Time =0.00E+00 yr ===
==========
==========

======== *Source Information* ========

Source: 1
Location:: Room : 1 x: 0.00 y: 2.50 z: 1.50 [m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	EU-154	1.000E-10

Source: 2
Location:: Room : 1 x: 15.00 y: 2.50 z: 1.50 [m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	EU-154	1.000E-10

Source: 3

Location:: Room : 1 x: 7.50 y: 0.00 z: 1.50 [m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	EU-154	1.000E-10

Source: 4

Location:: Room : 1 x: 7.50 y: 5.00 z: 1.50 [m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	EU-154	1.000E-10

Source: 5

Location:: Room : 1 x: 7.50 y: 2.50 z: 0.00 [m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	CS-137	1.660E+01
	I-129	2.660E+00

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th ROLBSMEARMIX Rev 0.bld
Evaluation Time: 0.00000000E+00 years

NB-94	5.000E-02
CO-60	9.800E-01

Source: 6
Location:: Room : 1 x: 7.50 y: 2.50 z: 3.00 [m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::

Nuclide	Concentration [pCi/m2]
EU-154	1.000E-10

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th ROLESMEARMIX Rev 0.bld
Evaluation Time: 0.00000000E+00 years

RESRAD-BUILDDose Tables

Source Contributions to Receptor Doses

(mrem)

	Source 1	Source 2	Source 3	Source 4	Source 5	Source 6	Total
Receptor 1	1.29E-16	1.29E-16	1.88E-15	1.88E-15	1.20E-04	3.09E-15	1.20E-04
Total	1.29E-16	1.29E-16	1.88E-15	1.88E-15	1.20E-04	3.09E-15	1.20E-04

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th ROLESMEARMIX Rev 0.bld
Evaluation Time: 0.00000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.28E-16	4.55E-25	8.52E-23	4.16E-20	0.00E+00	1.31E-18
Total	1.28E-16	4.55E-25	8.52E-23	4.16E-20	0.00E+00	1.31E-18

Source: 2

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.28E-16	4.55E-25	8.52E-23	4.16E-20	0.00E+00	1.31E-18
Total	1.28E-16	4.55E-25	8.52E-23	4.16E-20	0.00E+00	1.31E-18

Source: 3

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.88E-15	1.36E-24	2.56E-22	1.25E-19	0.00E+00	3.92E-18
Total	1.88E-15	1.36E-24	2.56E-22	1.25E-19	0.00E+00	3.92E-18

Source: 4

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.88E-15	1.36E-24	2.56E-22	1.25E-19	0.00E+00	3.92E-18
Total	1.88E-15	1.36E-24	2.56E-22	1.25E-19	0.00E+00	3.92E-18

Source: 5

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.09E-04	4.84E-14	4.10E-11	9.13E-09	0.00E+00	1.12E-05
Total	1.09E-04	4.84E-14	4.10E-11	9.13E-09	0.00E+00	1.12E-05

Source: 6

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	3.09E-15	2.27E-24	4.26E-22	2.08E-19	0.00E+00	6.54E-18
Total	3.09E-15	2.27E-24	4.26E-22	2.08E-19	0.00E+00	6.54E-18

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th ROLBSMEARMIX Rev 0.bld
Evaluation Time: 0.00000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor 1	Total
EU-154		
EU-154	1.29E-16	1.29E-16

Source: 2

Nuclide	Receptor 1	Total
EU-154		
EU-154	1.29E-16	1.29E-16

: 3

Nuclide	Receptor 1	Total
EU-154		
EU-154	1.88E-15	1.88E-15

Source: 4

Nuclide	Receptor 1	Total
EU-154		
EU-154	1.88E-15	1.88E-15

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th ROLESMEARMIX Rev 0.bld
Evaluation Time: 0.00000000E+00 years

Source: 5

Nuclide	Receptor 1	Total
CS-137		
CS-137	9.24E-05	9.24E-05
I-129		
I-129	6.47E-06	6.47E-06
NB-94		
NB-94	7.33E-07	7.33E-07
CO-60		
CO-60	2.05E-05	2.05E-05

Source: 6

Nuclide	Receptor 1	Total
EU-154		
EU-154	3.09E-15	3.09E-15

Summary

RESRAD-BUILD Dose (Time) Tables

Receptor Dose Received for the Exposure Duration

(mrem)

	Evaluation Time [yr]
	0.00E+00
1	1.20E-04

Receptor Dose/Yr Averaged Over Exposure Duration

(mrem/yr)

	Evaluation Time [yr]
	0.00E+00
1	1.20E-04

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 ROLBSMEARMIX Rev0.bld

RESRAD-BUILD Table of Contents

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 ROLBSMEARMIX Rev0.bld

RESRAD-BUILD Input Parameters

Number of Sources : 6
Number of Receptors: 1
Total Time : 3.652500E+02 days
Fraction Inside : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	7.500	2.500	1.000	1.000	3.36E+01	0.00E+00

Receptor-Source Shielding Relationship

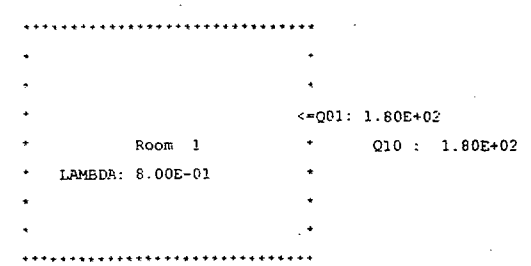
Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete
1	2	2.40E+00	0.00E+00	Concrete
1	3	2.40E+00	0.00E+00	Concrete
1	4	2.40E+00	0.00E+00	Concrete
1	5	2.40E+00	0.00E+00	Concrete
1	6	2.40E+00	0.00E+00	Concrete

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 ROLBSMEARMIX Rev0.bld

======== Building Information ========

Building Air Exchange Rate: 8.00E-01 1/hr

Height[m] Air Exchanges [m3/hr]
Area [m2]



Deposition velocity: 2.70E-06 [m/s] Resuspension Rate: 1.40E-05 [1/s]

======== Source Information ========

Source: 1

Location:: Room : 1 x: 0.00 y: 2.50 z: 1.50[m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
H-3	1.000E-10	6.400E-08	6.400E-08	0.000E+00

Source: 2

Location:: Room : 1 x: 15.00 y: 2.50 z: 1.50[m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
H-3	1.000E-10	6.400E-08	6.400E-08	0.000E+00

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 ROLBSMEARMIX Rev0.bld

Source: 3
Location:: Room : 1 x: 7.50 y: 0.00 z: 1.50[m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
H-3	1.000E-10	6.400E-08	6.400E-08	0.000E+00

Source: 4
Location:: Room : 1 x: 7.50 y: 5.00 z: 1.50[m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
H-3	1.000E-10	6.400E-08	6.400E-08	0.000E+00

Source: 5

Location:: Room : 1 x: 7.50 y: 2.50 z: 0.00[m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
H-3	3.890E+01	6.400E-08	6.400E-08	0.000E+00

Source: 6

Location:: Room : 1 x: 7.50 y: 2.50 z: 3.00[m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
H-3	1.000E-10	6.400E-08	6.400E-08	0.000E+00

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 ROLBSMEARMIX Rev0.bld
Evaluation Time: 0.00000000E+00 years

==========
==========
=== Assessment for Time: 1 ===
=== Time =0.00E+00 yr ===
==========
==========

======== Source Information ========

Source: 1
Location:: Room : 1 x: 0.00 y: 2.50 z: 1.50 [m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination:: Nuclide Concentration
[pCi/m2]
H-3 1.000E-10

Source: 2
Location:: Room : 1 x: 15.00 y: 2.50 z: 1.50 [m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination:: Nuclide Concentration
[pCi/m2]
H-3 1.000E-10

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 ROLBSMEARMIX Rev0.bld
Evaluation Time: 0.00000000E+00 years

Source: 3
Location:: Room : 1 x: 7.50 y: 0.00 z: 1.50 [m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	H-3	1.000E-10

Source: 4
Location:: Room : 1 x: 7.50 y: 5.00 z: 1.50 [m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	H-3	1.000E-10

Source: 5
Location:: Room : 1 x: 7.50 y: 2.50 z: 0.00 [m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	H-3	3.890E+01

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 ROLBSMEARMIX Rev0.bld
Evaluation Time: 0.00000000E+00 years

Source: 6
Location:: Room : 1 x: 7.50 y: 2.50 z: 3.00 [m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	H-3	1.000E-10

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 ROLBSMEARMIX Rev0.bld
Calculation Time: 0.00000000E+00 years

RESRAD-BUILDDose Tables

Source Contributions to Receptor Doses

(mrem)

	Source 1	Source 2	Source 3	Source 4	Source 5	Source 6	Total
Receptor 1	9.39E-21	9.39E-21	2.82E-20	2.82E-20	1.83E-08	4.69E-20	1.83E-08
Total	9.39E-21	9.39E-21	2.82E-20	2.82E-20	1.83E-08	4.69E-20	1.83E-08

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	5.84E-22	0.00E+00	8.80E-21
Total	0.00E+00	0.00E+00	0.00E+00	5.84E-22	0.00E+00	8.80E-21

Source: 2

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	5.84E-22	0.00E+00	8.80E-21
Total	0.00E+00	0.00E+00	0.00E+00	5.84E-22	0.00E+00	8.80E-21

Source: 3

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	1.75E-21	0.00E+00	2.64E-20
Total	0.00E+00	0.00E+00	0.00E+00	1.75E-21	0.00E+00	2.64E-20

Source: 4

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	1.75E-21	0.00E+00	2.64E-20
Total	0.00E+00	0.00E+00	0.00E+00	1.75E-21	0.00E+00	2.64E-20

Source: 5

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	1.14E-09	0.00E+00	1.71E-08
Total	0.00E+00	0.00E+00	0.00E+00	1.14E-09	0.00E+00	1.71E-08

Source: 6

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	2.92E-21	0.00E+00	4.40E-20
Total	0.00E+00	0.00E+00	0.00E+00	2.92E-21	0.00E+00	4.40E-20

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor 1	Total
H-3		
H-3	9.39E-21	9.39E-21

Source: 2

Nuclide	Receptor 1	Total
H-3		
H-3	9.39E-21	9.39E-21

Source: 3

Nuclide	Receptor 1	Total
H-3		
H-3	2.82E-20	2.82E-20

Source: 4

Nuclide	Receptor 1	Total
H-3		
H-3	2.82E-20	2.82E-20

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 ROLBSMEARMIX Rev0.bld
Evaluation Time: 0.00000000E+00 years

Source: 5

Nuclide	Receptor 1	Total
H-3		
H-3	1.83E-08	1.83E-08

Source: 6

Nuclide	Receptor 1	Total
H-3		
H-3	4.69E-20	4.69E-20

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 ROLBSMEARMIX Rev0.bld

Summary

RESRAD-BUILD Dose (Time) Tables

Receptor Dose Received for the Exposure Duration

(mrem)

	Evaluation Time [yr]
	0.00E+00
1	1.83E-06

Receptor Dose/Yr Averaged Over Exposure Duration

(mrem/yr)

	Evaluation Time [yr]
	0.00E+00
1	1.83E-06

Table of Contents

Part I: Mixture Sums and Single Radionuclide Guidelines

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

Menu	Parameter	Current Value	Default	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	6.720E+00	6.720E+00	DCF2(1)
B-1	Ag-108m+D	2.830E-04	2.830E-04	DCF2(2)
B-1	Am-241	4.440E-01	4.440E-01	DCF2(3)
B-1	Am-243+D	4.400E-01	4.400E-01	DCF2(4)
B-1	C-14	2.090E-06	2.090E-06	DCF2(5)
B-1	Cm-243	3.070E-01	3.070E-01	DCF2(6)
B-1	Co-60	2.190E-04	2.190E-04	DCF2(8)
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2(9)
B-1	Eu-152	2.210E-04	2.210E-04	DCF2(10)
B-1	Eu-154	2.860E-04	2.860E-04	DCF2(12)
B-1	Eu-155	4.140E-05	4.140E-05	DCF2(13)
B-1	Fe-55	2.690E-06	2.690E-06	DCF2(14)
B-1	Gd-152	2.430E-01	2.430E-01	DCF2(15)
B-1	H-3	6.400E-08	6.400E-08	DCF2(16)
B-1	I-129	1.740E-04	1.740E-04	DCF2(17)
B-1	Na-22	7.660E-06	7.660E-06	DCF2(18)
B-1	Nb-94	4.140E-04	4.140E-04	DCF2(19)
B-1	Ni-59	2.700E-06	2.700E-06	DCF2(20)
B-1	Ni-63	6.290E-06	6.290E-06	DCF2(21)
B-1	Np-237+D	5.400E-01	5.400E-01	DCF2(22)
B-1	Pa-231	1.280E+00	1.280E+00	DCF2(23)
B-1	Pb-210+D	2.320E-02	2.320E-02	DCF2(24)
B-1	Pu-238	3.920E-01	3.920E-01	DCF2(25)
B-1	Pu-239	4.290E-01	4.290E-01	DCF2(26)
B-1	Pu-241+D	8.250E-03	8.250E-03	DCF2(27)
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF2(29)
B-1	Sb-125+D	1.386E-05	1.386E-05	DCF2(30)
B-1	Sr-90+D	1.310E-03	1.310E-03	DCF2(31)
B-1	Tc-99	8.330E-06	8.330E-06	DCF2(32)
B-1	Th-229+D	2.160E+00	2.160E+00	DCF2(33)
B-1	Th-230	3.260E-01	3.260E-01	DCF2(34)
B-1	U-233	1.350E-01	1.350E-01	DCF2(35)
B-1	U-234	1.320E-01	1.320E-01	DCF2(36)
B-1	U-235+D	1.230E-01	1.230E-01	DCF2(37)
B-1	U-238+D	1.180E-01	1.180E-01	DCF2(38)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	1.480E-02	1.480E-02	DCF3(1)
D-1	Ag-108m+D	7.620E-06	7.620E-06	DCF3(2)
D-1	Am-241	3.640E-03	3.640E-03	DCF3(3)
D-1	Am-243+D	3.630E-03	3.630E-03	DCF3(4)
D-1	C-14	2.090E-06	2.090E-06	DCF3(5)
D-1	Cm-243	2.510E-03	2.510E-03	DCF3(6)
D-1	Co-60	2.690E-05	2.690E-05	DCF3(8)
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3(9)
D-1	Eu-152	6.480E-06	6.480E-06	DCF3(10)
D-1	Eu-154	9.550E-06	9.550E-06	DCF3(12)
D-1	Eu-155	1.530E-06	1.530E-06	DCF3(13)
D-1	Fe-55	6.070E-07	6.070E-07	DCF3(14)

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

Menu	Parameter	Current Value	Default	Parameter Name
D-1	Gd-152	1.610E-04	1.610E-04	DCF3(15)
D-1	H-3	6.400E-08	6.400E-08	DCF3(16)
D-1	I-129	2.760E-04	2.760E-04	DCF3(17)
D-1	Na-22	1.150E-05	1.150E-05	DCF3(18)
D-1	Nb-94	7.140E-06	7.140E-06	DCF3(19)
D-1	Ni-59	2.100E-07	2.100E-07	DCF3(20)
D-1	Ni-63	5.770E-07	5.770E-07	DCF3(21)
D-1	Np-237+D	4.440E-03	4.440E-03	DCF3(22)
D-1	Pa-231	1.060E-02	1.060E-02	DCF3(23)
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF3(24)
D-1	Pu-238	3.200E-03	3.200E-03	DCF3(25)
D-1	Pu-239	3.540E-03	3.540E-03	DCF3(26)
D-1	Pu-241+D	6.850E-05	6.850E-05	DCF3(27)
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF3(29)
D-1	Sb-125+D	3.647E-06	3.647E-06	DCF3(30)
D-1	Sr-90+D	1.530E-04	1.530E-04	DCF3(31)
D-1	Tc-99	1.460E-06	1.460E-06	DCF3(32)
D-1	Th-229+D	4.030E-03	4.030E-03	DCF3(33)
D-1	Th-230	5.480E-04	5.480E-04	DCF3(34)
D-1	U-233	2.890E-04	2.890E-04	DCF3(35)
D-1	U-234	2.830E-04	2.830E-04	DCF3(36)
D-1	U-235+D	2.670E-04	2.670E-04	DCF3(37)
D-1	U-238+D	2.690E-04	2.690E-04	DCF3(38)
D-34	Food transfer factors:			
D-34	Ac-227+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(1,1)
D-34	Ac-227+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,2)
D-34	Ac-227+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,3)
D-34				
D-34	Ag-108m+D, plant/soil concentration ratio, dimensionless	1.500E-01	1.500E-01	RTF(2,1)
D-34	Ag-108m+D, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-03	3.000E-03	RTF(2,2)
D-34	Ag-108m+D, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.500E-02	2.500E-02	RTF(2,3)
D-34				
D-34	Am-241 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(3,1)
D-34	Am-241 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-05	5.000E-05	RTF(3,2)
D-34	Am-241 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(3,3)
D-34				
D-34	Am-243+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(4,1)
D-34	Am-243+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-05	5.000E-05	RTF(4,2)
D-34	Am-243+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(4,3)
D-34				
D-34	C-14 , plant/soil concentration ratio, dimensionless	5.500E+00	5.500E+00	RTF(5,1)
D-34	C-14 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.100E-02	3.100E-02	RTF(5,2)
D-34	C-14 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.200E-02	1.200E-02	RTF(5,3)
D-34				
D-34	Cm-243 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(6,1)
D-34	Cm-243 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(6,2)
D-34	Cm-243 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(6,3)
D-34				

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

Menu	Parameter	Current Value	Default	Parameter Name
D-34	Co-60 , plant/soil concentration ratio, dimensionless	8.000E-02	8.000E-02	RTF(8,1)
D-34	Co-60 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-02	2.000E-02	RTF(8,2)
D-34	Co-60 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(8,3)
D-34				
D-34	Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(9,1)
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(9,2)
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(9,3)
D-34				
D-34	Eu-152 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(10,1)
D-34	Eu-152 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(10,2)
D-34	Eu-152 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(10,3)
D-34				
D-34	Eu-154 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(12,1)
D-34	Eu-154 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(12,2)
D-34	Eu-154 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(12,3)
D-34				
D-34	Eu-155 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(13,1)
D-34	Eu-155 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(13,2)
D-34	Eu-155 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(13,3)
D-34				
	Fe-55 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(14,1)
	Fe-55 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-02	2.000E-02	RTF(14,2)
D-34	Fe-55 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(14,3)
D-34				
D-34	Gd-152 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(15,1)
D-34	Gd-152 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(15,2)
D-34	Gd-152 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(15,3)
D-34				
D-34	H-3 , plant/soil concentration ratio, dimensionless	4.800E+00	4.800E+00	RTF(16,1)
D-34	H-3 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.200E-02	1.200E-02	RTF(16,2)
D-34	H-3 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-02	1.000E-02	RTF(16,3)
D-34				
D-34	I-129 , plant/soil concentration ratio, dimensionless	2.000E-02	2.000E-02	RTF(17,1)
D-34	I-129 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	7.000E-03	7.000E-03	RTF(17,2)
D-34	I-129 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-02	1.000E-02	RTF(17,3)
D-34				
D-34	Na-22 , plant/soil concentration ratio, dimensionless	5.000E-02	5.000E-02	RTF(18,1)
D-34	Na-22 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-02	8.000E-02	RTF(18,2)
D-34	Na-22 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	4.000E-02	4.000E-02	RTF(18,3)
D-34				
D-34	Nb-94 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(19,1)
D-34	Nb-94 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-07	3.000E-07	RTF(19,2)
D-34	Nb-94 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(19,3)
D-34				
D-34	Ni-59 , plant/soil concentration ratio, dimensionless	5.000E-02	5.000E-02	RTF(20,1)
D-34	Ni-59 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(20,2)
	Ni-59 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-02	2.000E-02	RTF(20,3)
D-34				

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

Menu	Parameter	Current Value	Default	Parameter Name
D-34	Ni-63 , plant/soil concentration ratio, dimensionless	5.000E-02	5.000E-02	RTF(21,1)
D-34	Ni-63 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(21,2)
D-34	Ni-63 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-02	2.000E-02	RTF(21,3)
D-34				
D-34	Np-237+D , plant/soil concentration ratio, dimensionless	2.000E-02	2.000E-02	RTF(22,1)
D-34	Np-237+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(22,2)
D-34	Np-237+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(22,3)
D-34				
D-34	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(23,1)
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(23,2)
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(23,3)
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(24,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(24,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(24,3)
D-34				
D-34	Pu-238 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(25,1)
D-34	Pu-238 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(25,2)
D-34	Pu-238 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(25,3)
D-34				
	Pu-239 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(26,1)
	Pu-239 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(26,2)
D-34	Pu-239 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(26,3)
D-34				
D-34	Pu-241+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(27,1)
D-34	Pu-241+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(27,2)
D-34	Pu-241+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(27,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(29,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(29,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(29,3)
D-34				
D-34	Sb-125+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(30,1)
D-34	Sb-125+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(30,2)
D-34	Sb-125+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-04	1.000E-04	RTF(30,3)
D-34				
D-34	Sr-90+D , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF(31,1)
D-34	Sr-90+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-03	8.000E-03	RTF(31,2)
D-34	Sr-90+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(31,3)
D-34				
D-34	Tc-99 , plant/soil concentration ratio, dimensionless	5.000E+00	5.000E+00	RTF(32,1)
D-34	Tc-99 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(32,2)
D-34	Tc-99 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(32,3)
D-34				
D-34	Th-229+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(33,1)
D-34	Th-229+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(33,2)
D-34	Th-229+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(33,3)
D-34				

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: PGR 13 Morbidity

Menu	Parameter	Current Value	Default	Parameter Name
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(34,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(34,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(34,3)
D-34				
D-34	U-233 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(35,1)
D-34	U-233 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(35,2)
D-34	U-233 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(35,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(36,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(36,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(36,3)
D-34				
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(37,1)
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(37,2)
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(37,3)
D-34				
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(38,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(38,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(38,3)
	Bioaccumulation factors, fresh water, L/kg:			
	Ac-227+D , fish	1.500E+01	1.500E+01	BIOFAC(1,1)
D-5	Ac-227+D , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(1,2)
D-5				
D-5	Ag-108m+D, fish	5.000E+00	5.000E+00	BIOFAC(2,1)
D-5	Ag-108m+D, crustacea and mollusks	7.700E+02	7.700E+02	BIOFAC(2,2)
D-5				
D-5	Am-241 , fish	3.000E+01	3.000E+01	BIOFAC(3,1)
D-5	Am-241 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(3,2)
D-5				
D-5	Am-243+D , fish	3.000E+01	3.000E+01	BIOFAC(4,1)
D-5	Am-243+D , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(4,2)
D-5				
D-5	C-14 , fish	5.000E+04	5.000E+04	BIOFAC(5,1)
D-5	C-14 , crustacea and mollusks	9.100E+03	9.100E+03	BIOFAC(5,2)
D-5				
D-5	Cm-243 , fish	3.000E+01	3.000E+01	BIOFAC(6,1)
D-5	Cm-243 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(6,2)
D-5				
D-5	Co-60 , fish	3.000E+02	3.000E+02	BIOFAC(8,1)
D-5	Co-60 , crustacea and mollusks	2.000E+02	2.000E+02	BIOFAC(8,2)
D-5				
D-5	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC(9,1)
D-5	Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(9,2)
D-5				
D-5	Eu-152 , fish	5.000E+01	5.000E+01	BIOFAC(10,1)
	Eu-152 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(10,2)
D-5				
D-5	Eu-154 , fish	5.000E+01	5.000E+01	BIOFAC(12,1)
D-5	Eu-154 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(12,2)

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

Menu	Parameter	Current Value	Default	Parameter Name
D-5	Eu-155 , fish	5.000E+01	5.000E+01	BIOFAC(13,1)
D-5	Eu-155 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(13,2)
D-5				
D-5	Fe-55 , fish	2.000E+02	2.000E+02	BIOFAC(14,1)
D-5	Fe-55 , crustacea and mollusks	3.200E+03	3.200E+03	BIOFAC(14,2)
D-5				
D-5	Gd-152 , fish	2.500E+01	2.500E+01	BIOFAC(15,1)
D-5	Gd-152 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(15,2)
D-5				
D-5	H-3 , fish	1.000E+00	1.000E+00	BIOFAC(16,1)
D-5	H-3 , crustacea and mollusks	1.000E+00	1.000E+00	BIOFAC(16,2)
D-5				
D-5	I-129 , fish	4.000E+01	4.000E+01	BIOFAC(17,1)
D-5	I-129 , crustacea and mollusks	5.000E+00	5.000E+00	BIOFAC(17,2)
D-5				
D-5	Na-22 , fish	2.000E+01	2.000E+01	BIOFAC(18,1)
D-5	Na-22 , crustacea and mollusks	2.000E+02	2.000E+02	BIOFAC(18,2)
D-5				
D-5	Nb-94 , fish	3.000E+02	3.000E+02	BIOFAC(19,1)
D-5	Nb-94 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(19,2)
	Ni-59 , fish	1.000E+02	1.000E+02	BIOFAC(20,1)
D-5	Ni-59 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(20,2)
D-5				
D-5	Ni-63 , fish	1.000E+02	1.000E+02	BIOFAC(21,1)
D-5	Ni-63 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(21,2)
D-5				
D-5	Np-237+D , fish	3.000E+01	3.000E+01	BIOFAC(22,1)
D-5	Np-237+D , crustacea and mollusks	4.000E+02	4.000E+02	BIOFAC(22,2)
D-5				
D-5	Pa-231 , fish	1.000E+01	1.000E+01	BIOFAC(23,1)
D-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(23,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(24,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(24,2)
D-5				
D-5	Pu-238 , fish	3.000E+01	3.000E+01	BIOFAC(25,1)
D-5	Pu-238 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(25,2)
D-5				
D-5	Pu-239 , fish	3.000E+01	3.000E+01	BIOFAC(26,1)
D-5	Pu-239 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(26,2)
D-5				
D-5	Pu-241+D , fish	3.000E+01	3.000E+01	BIOFAC(27,1)
D-5	Pu-241+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(27,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(29,1)
	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(29,2)
D-5				
D-5	Sb-125+D , fish	1.000E+02	1.000E+02	BIOFAC(30,1)
D-5	Sb-125+D , crustacea and mollusks	1.000E+01	1.000E+01	BIOFAC(30,2)

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

Menu	Parameter	Current Value	Default	Parameter Name
D-5	Sr-90+D , fish	6.000E+01	6.000E+01	BIOFAC(31,1)
D-5	Sr-90+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(31,2)
D-5				
D-5	Tc-99 , fish	2.000E+01	2.000E+01	BIOFAC(32,1)
D-5	Tc-99 , crustacea and mollusks	5.000E+00	5.000E+00	BIOFAC(32,2)
D-5				
D-5	Th-229+D , fish	1.000E+02	1.000E+02	BIOFAC(33,1)
D-5	Th-229+D , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(33,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(34,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(34,2)
D-5				
D-5	U-233 , fish	1.000E+01	1.000E+01	BIOFAC(35,1)
D-5	U-233 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(35,2)
D-5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(36,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(36,2)
D-5				
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIOFAC(37,1)
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(37,2)
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(38,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(38,2)

Summary : RESRAD Default Parameters
File : Plumbrook Subsurface Modified ROLBSMEARMIX Rev 0.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)	3.850E+03	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	3.000E+00	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	7.000E+01	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	2.500E+01	---	BRDL
R011	Time since placement of material (yr)	1.000E+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): Am-241	2.000E-02	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): C-14	2.600E-01	0.000E+00	---	S1(5)
R012	Initial principal radionuclide (pCi/g): Cm-243	1.000E-02	0.000E+00	---	S1(6)
R012	Initial principal radionuclide (pCi/g): Co-60	9.800E-01	0.000E+00	---	S1(8)
R012	Initial principal radionuclide (pCi/g): Cs-137	1.662E+01	0.000E+00	---	S1(9)
R012	Initial principal radionuclide (pCi/g): Eu-155	1.200E-01	0.000E+00	---	S1(13)
R012	Initial principal radionuclide (pCi/g): H-3	3.887E+01	0.000E+00	---	S1(16)
R012	Initial principal radionuclide (pCi/g): I-129	2.660E+00	0.000E+00	---	S1(17)
R012	Initial principal radionuclide (pCi/g): Nb-94	5.000E-02	0.000E+00	---	S1(19)
R012	Initial principal radionuclide (pCi/g): Ni-59	1.680E+00	0.000E+00	---	S1(20)
R012	Initial principal radionuclide (pCi/g): Ni-63	2.300E-01	0.000E+00	---	S1(21)
R012	Initial principal radionuclide (pCi/g): Np-237	5.000E-02	0.000E+00	---	S1(22)
R012	Initial principal radionuclide (pCi/g): Pu-239	2.000E-02	0.000E+00	---	S1(26)
R012	Initial principal radionuclide (pCi/g): Pu-241	4.500E-01	0.000E+00	---	S1(27)
R012	Initial principal radionuclide (pCi/g): Sb-125	2.300E-01	0.000E+00	---	S1(30)
R012	Initial principal radionuclide (pCi/g): Sr-90	4.030E+00	0.000E+00	---	S1(31)
R012	Initial principal radionuclide (pCi/g): Tc-99	3.000E-01	0.000E+00	---	S1(32)
R012	Initial principal radionuclide (pCi/g): U-234	3.187E+01	0.000E+00	---	S1(36)
R012	Initial principal radionuclide (pCi/g): U-235	1.120E+00	0.000E+00	---	S1(37)
R012	Initial principal radionuclide (pCi/g): U-238	4.200E-01	0.000E+00	---	S1(38)
R012	Concentration in groundwater (pCi/L): Am-241	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): C-14	not used	0.000E+00	---	W1(5)
R012	Concentration in groundwater (pCi/L): Cm-243	not used	0.000E+00	---	W1(6)
R012	Concentration in groundwater (pCi/L): Co-60	not used	0.000E+00	---	W1(8)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	W1(9)
R012	Concentration in groundwater (pCi/L): Eu-155	not used	0.000E+00	---	W1(13)
R012	Concentration in groundwater (pCi/L): H-3	not used	0.000E+00	---	W1(16)
R012	Concentration in groundwater (pCi/L): I-129	not used	0.000E+00	---	W1(17)
R012	Concentration in groundwater (pCi/L): Nb-94	not used	0.000E+00	---	W1(19)
R012	Concentration in groundwater (pCi/L): Ni-59	not used	0.000E+00	---	W1(20)
R012	Concentration in groundwater (pCi/L): Ni-63	not used	0.000E+00	---	W1(21)
R012	Concentration in groundwater (pCi/L): Np-237	not used	0.000E+00	---	W1(22)
R012	Concentration in groundwater (pCi/L): Pu-239	not used	0.000E+00	---	W1(26)
R012	Concentration in groundwater (pCi/L): Pu-241	not used	0.000E+00	---	W1(27)
R012	Concentration in groundwater (pCi/L): Sb-125	not used	0.000E+00	---	W1(30)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R012	Concentration in groundwater (pCi/L): Sr-90	not used	0.000E+00	---	W1(31)
R012	Concentration in groundwater (pCi/L): Tc-99	not used	0.000E+00	---	W1(32)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(36)
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	---	W1(37)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(38)
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)	1.560E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.100E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	8.600E-01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	1.400E+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)	8.000E+00	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	8.600E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	1.040E+00	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)	1.000E+06	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	1.460E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	4.500E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	2.000E-01	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	2.000E-01	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	1.070E+03	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	4.500E-03	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	0.000E+00	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	2.010E+00	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	MB	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	1.180E+02	2.500E+02	---	UW
R015	Number of unsaturated zone strata	1	1	---	NS
R015	Unsat. zone 1, thickness (m)	0.000E+00	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.560E+00	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	4.100E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	3.000E-01	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	2.000E-01	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	1.400E+00	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	1.262E+03	1.000E+01	---	HCUZ(1)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Am-241				
R016	Contaminated zone (cm**3/g)	4.450E+02	2.000E+01	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.146E-04	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for C-14				
R016	Contaminated zone (cm**3/g)	2.600E+01	0.000E+00	---	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	2.100E+01	0.000E+00	---	DCNUCU(5,1)
R016	Saturated zone (cm**3/g)	2.100E+01	0.000E+00	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.030E-03	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R016	Distribution coefficients for Cm-243				
R016	Contaminated zone (cm**3/g)	4.000E+02	-1.000E+00	---	DCNUCC(6)
R016	Unsaturated zone 1 (cm**3/g)	6.760E+03	-1.000E+00	---	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	6.760E+03	-1.000E+00	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.612E-04	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R016	Distribution coefficients for Co-60				
R016	Contaminated zone (cm**3/g)	1.700E+01	1.000E+03	---	DCNUCC(8)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCU(8,1)
R016	Saturated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.069E-02	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	6.500E+00	1.000E+03	---	DCNUCC(9)
R016	Unsaturated zone 1 (cm**3/g)	4.470E+02	1.000E+03	---	DCNUCU(9,1)
R016	Saturated zone (cm**3/g)	4.470E+02	1.000E+03	---	DCNUCS(9)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.730E-02	ALEACH(9)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(9)
R016	Distribution coefficients for Eu-155				
R016	Contaminated zone (cm**3/g)	4.000E+02	-1.000E+00	---	DCNUCC(13)
R016	Unsaturated zone 1 (cm**3/g)	9.550E+02	-1.000E+00	---	DCNUCU(13,1)
R016	Saturated zone (cm**3/g)	9.550E+02	-1.000E+00	---	DCNUCS(13)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.612E-04	ALEACH(13)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(13)
R016	Distribution coefficients for H-3				
R016	Contaminated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCC(16)
R016	Unsaturated zone 1 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU(16,1)
R016	Saturated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCS(16)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.024E-01	ALEACH(16)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(16)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for I-129				
R016	Contaminated zone (cm**3/g)	3.200E+00	1.000E-01	---	DCNUCC(17)
R016	Unsaturated zone 1 (cm**3/g)	1.000E-01	1.000E-01	---	DCNUCU(17,1)
R016	Saturated zone (cm**3/g)	1.000E-01	1.000E-01	---	DCNUCS(17)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.331E-02	ALEACH(17)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(17)
R016	Distribution coefficients for Nb-94				
R016	Contaminated zone (cm**3/g)	3.250E+02	0.000E+00	---	DCNUCC(19)
R016	Unsaturated zone 1 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU(19,1)
R016	Saturated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCS(19)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.676E-04	ALEACH(19)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(19)
R016	Distribution coefficients for Ni-59				
R016	Contaminated zone (cm**3/g)	3.200E+01	1.000E+03	---	DCNUCC(20)
R016	Unsaturated zone 1 (cm**3/g)	3.700E+01	1.000E+03	---	DCNUCU(20,1)
R016	Saturated zone (cm**3/g)	3.700E+01	1.000E+03	---	DCNUCS(20)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.722E-03	ALEACH(20)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(20)
	Distribution coefficients for Ni-63				
	Contaminated zone (cm**3/g)	3.200E+01	1.000E+03	---	DCNUCC(21)
R016	Unsaturated zone 1 (cm**3/g)	3.700E+01	1.000E+03	---	DCNUCU(21,1)
R016	Saturated zone (cm**3/g)	3.700E+01	1.000E+03	---	DCNUCS(21)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.722E-03	ALEACH(21)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(21)
R016	Distribution coefficients for Np-237				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCC(22)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCU(22,1)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCS(22)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.164E-04	ALEACH(22)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(22)
R016	Distribution coefficients for Pu-239				
R016	Contaminated zone (cm**3/g)	1.625E+03	2.000E+03	---	DCNUCC(26)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCU(26,1)
R016	Saturated zone (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCS(26)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.136E-04	ALEACH(26)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(26)
R016	Distribution coefficients for Pu-241				
R016	Contaminated zone (cm**3/g)	1.625E+03	2.000E+03	---	DCNUCC(27)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCU(27,1)
R016	Saturated zone (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCS(27)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.136E-04	ALEACH(27)
	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(27)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Sb-125				
R016	Contaminated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCC(30)
R016	Unsaturated zone 1 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU(30,1)
R016	Saturated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCS(30)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.024E-01	ALEACH(30)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(30)
R016	Distribution coefficients for Sr-90				
R016	Contaminated zone (cm**3/g)	3.500E+00	3.000E+01	---	DCNUCC(31)
R016	Unsaturated zone 1 (cm**3/g)	3.200E+01	3.000E+01	---	DCNUCU(31,1)
R016	Saturated zone (cm**3/g)	3.200E+01	3.000E+01	---	DCNUCS(31)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.906E-02	ALEACH(31)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(31)
R016	Distribution coefficients for Tc-99				
R016	Contaminated zone (cm**3/g)	5.200E+00	0.000E+00	---	DCNUCC(32)
R016	Unsaturated zone 1 (cm**3/g)	7.000E+00	0.000E+00	---	DCNUCU(32,1)
R016	Saturated zone (cm**3/g)	7.000E+00	0.000E+00	---	DCNUCS(32)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.379E-02	ALEACH(32)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(32)
	Distribution coefficients for U-234				
	Contaminated zone (cm**3/g)	2.120E+02	5.000E+01	---	DCNUCC(36)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(36,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(36)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.697E-04	ALEACH(36)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(36)
R016	Distribution coefficients for U-235				
R016	Contaminated zone (cm**3/g)	2.120E+02	5.000E+01	---	DCNUCC(37)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(37,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(37)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.697E-04	ALEACH(37)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(37)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	2.120E+02	5.000E+01	---	DCNUCC(38)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(38,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(38)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.697E-04	ALEACH(38)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(38)
R016	Distribution coefficients for daughter Ac-227				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.111E-03	ALEACH(1)
	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for daughter Ag-108m				
R016	Contaminated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.024E-01	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for daughter Am-243				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(4)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.111E-03	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)
R016	Distribution coefficients for daughter Eu-152				
R016	Contaminated zone (cm**3/g)	4.000E+02	-1.000E+00	---	DCNUCC(10)
R016	Unsaturated zone 1 (cm**3/g)	9.550E+02	-1.000E+00	---	DCNUCU(10,1)
R016	Saturated zone (cm**3/g)	9.550E+02	-1.000E+00	---	DCNUCS(10)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.612E-04	ALEACH(10)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(10)
	Distribution coefficients for daughter Eu-152				
	Contaminated zone (cm**3/g)	4.000E+02	-1.000E+00	---	DCNUCC(11)
R016	Unsaturated zone 1 (cm**3/g)	9.550E+02	-1.000E+00	---	DCNUCU(11,1)
R016	Saturated zone (cm**3/g)	9.550E+02	-1.000E+00	---	DCNUCS(11)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.612E-04	ALEACH(11)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(11)
R016	Distribution coefficients for daughter Eu-154				
R016	Contaminated zone (cm**3/g)	4.000E+02	-1.000E+00	---	DCNUCC(12)
R016	Unsaturated zone 1 (cm**3/g)	9.550E+02	-1.000E+00	---	DCNUCU(12,1)
R016	Saturated zone (cm**3/g)	9.550E+02	-1.000E+00	---	DCNUCS(12)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.612E-04	ALEACH(12)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(12)
R016	Distribution coefficients for daughter Fe-55				
R016	Contaminated zone (cm**3/g)	1.300E+01	1.000E+03	---	DCNUCC(14)
R016	Unsaturated zone 1 (cm**3/g)	8.910E+02	1.000E+03	---	DCNUCU(14,1)
R016	Saturated zone (cm**3/g)	8.910E+02	1.000E+03	---	DCNUCS(14)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.392E-02	ALEACH(14)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(14)
R016	Distribution coefficients for daughter Gd-152				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCC(15)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU(15,1)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCS(15)
R0	Leach rate (/yr)	0.000E+00	0.000E+00	2.237E-04	ALEACH(15)
	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(15)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for daughter Na-22				
R016	Contaminated zone (cm**3/g)	1.000E+01	1.000E+01	---	DCNUCC(18)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+01	1.000E+01	---	DCNUCU(18,1)
R016	Saturated zone (cm**3/g)	1.000E+01	1.000E+01	---	DCNUCS(18)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.799E-02	ALEACH(18)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(18)
R016	Distribution coefficients for daughter Pa-231				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(23)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(23,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(23)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.673E-03	ALEACH(23)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(23)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC(24)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCU(24,1)
R016	Saturated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCS(24)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.841E-03	ALEACH(24)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(24)
R016	Distribution coefficients for daughter Pu-238				
R016	Contaminated zone (cm**3/g)	1.625E+03	2.000E+03	---	DCNUCC(25)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCU(25,1)
R016	Saturated zone (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCS(25)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.136E-04	ALEACH(25)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(25)
R016	Distribution coefficients for daughter Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(29)
R016	Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU(29,1)
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCS(29)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.627E-03	ALEACH(29)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(29)
R016	Distribution coefficients for daughter Th-229				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(33)
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCU(33,1)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(33)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.077E-06	ALEACH(33)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(33)
R016	Distribution coefficients for daughter Th-230				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(34)
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCU(34,1)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(34)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.077E-06	ALEACH(34)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(34)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for daughter U-233				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(35)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(35,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(35)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.673E-03	ALEACH(35)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(35)
R017	Inhalation rate (m**3/yr)	8.400E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	6.000E-06	1.000E-04	---	MLINH
R017	Exposure duration	3.653E+02	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	4.700E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	6.600E-01	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	1.100E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS
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)	7.800E+01	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	1.500E+01	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	1.180E+02	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	5.200E+01	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	1.600E+01	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	0.000E+00	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	1.830E+01	3.650E+01	---	SOIL

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R018	Drinking water intake (L/yr)	4.780E+02	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	1.000E+00	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	1.000E+00	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	1.000E+00	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	5.000E-01	5.000E-01	---	FR9
R018	Contamination fraction of plant food	1.000E+00	-1	---	FPLANT
R018	Contamination fraction of meat	1.000E+00	-1	---	FMEAT
R018	Contamination fraction of milk	1.000E+00	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	8.500E+00	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	1.700E+01	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	5.000E+01	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	1.600E+02	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	5.000E-01	5.000E-01	---	LSI
R019	Mass loading for foliar deposition (g/m**3)	1.000E-04	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	9.000E-01	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	1.000E+00	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	1.000E+00	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	1.000E+00	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	7.000E-01	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	1.500E+00	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	1.100E+00	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	1.700E-01	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	2.500E-01	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	8.000E-02	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	1.000E-01	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	1.000E+00	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	1.000E+00	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	2.000E+01	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	2.000E-05	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	3.000E-02	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	2.000E-02	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	9.800E-01	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	3.000E-01	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	7.000E-07	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	1.000E-10	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	8.000E-01	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	2.000E-01	2.000E-01	---	AVFG5
C14	DCF correction factor for gaseous forms of C14	8.894E+01	8.894E+01	---	CO2F

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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
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	1	---	---	KYMAX

Summary of Pathway Selections

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

Contaminated Zone Dimensions	
Area:	3850.00 square meters
Thickness:	3.00 meters
Cover Depth:	0.00 meters

Initial Soil Concentrations, pCi/g	
Am-241	2.000E-02
C-14	2.600E-01
Cm-243	1.000E-02
Co-60	9.800E-01
Cs-137	1.662E+01
Eu-155	1.200E-01
H-3	3.887E+01
I-129	2.660E+00
Nb-94	5.000E-02
Ni-59	1.680E+00
Ni-63	2.300E-01
Np-237	5.000E-02
Pu-239	2.000E-02
Pu-241	4.500E-01
Sb-125	2.300E-01
Sr-90	4.030E+00
Tc-99	3.000E-01
U-234	3.187E+01
U-235	1.120E+00
U-238	4.200E-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):	6.420E+02	6.043E+02	5.405E+02	3.726E+02	1.455E+02	3.811E+01	2.957E+01	1.404E+01
M(t):	2.568E+01	2.417E+01	2.162E+01	1.490E+01	5.819E+00	1.524E+00	1.183E+00	5.616E-01

Maximum TDOSE(t): 6.420E+02 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-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	3.477E-04	0.0000	2.566E-05	0.0000	0.000E+00	0.0000	6.773E-03	0.0000	9.616E-05	0.0000	8.875E-06	0.0000	1.025E-03	0.0000
C-14	5.626E-07	0.0000	4.032E-05	0.0000	0.000E+00	0.0000	2.132E-01	0.0003	1.029E-01	0.0002	6.233E-02	0.0001	3.075E-06	0.0000
Cm-243	2.261E-03	0.0000	8.771E-06	0.0000	0.000E+00	0.0000	2.309E-03	0.0000	1.311E-05	0.0000	3.025E-06	0.0000	3.493E-04	0.0000
Co-60	5.720E+00	0.0089	5.787E-07	0.0000	0.000E+00	0.0000	1.829E-01	0.0003	3.019E-02	0.0000	1.080E-02	0.0000	3.463E-04	0.0000
Cs-137	2.121E+01	0.0330	1.496E-06	0.0000	0.000E+00	0.0000	3.017E+00	0.0047	1.065E+00	0.0017	9.043E-01	0.0014	1.142E-02	0.0000
Eu-155	8.083E-03	0.0000	1.341E-08	0.0000	0.000E+00	0.0000	3.985E-05	0.0000	9.288E-06	0.0000	2.194E-07	0.0000	2.414E-06	0.0000
H-3	0.000E+00	0.0000	1.025E-02	0.0000	0.000E+00	0.0000	3.827E-01	0.0006	2.284E-02	0.0000	4.664E-02	0.0001	1.842E-05	0.0000
I-129	1.368E-02	0.0000	1.304E-06	0.0000	0.000E+00	0.0000	1.333E+00	0.0021	1.751E-01	0.0003	7.110E-01	0.0011	1.007E-02	0.0000
Nb-94	1.857E-01	0.0003	5.986E-08	0.0000	0.000E+00	0.0000	3.320E-04	0.0000	3.257E-09	0.0000	5.644E-08	0.0000	5.029E-06	0.0000
Ni-59	0.000E+00	0.0000	1.308E-08	0.0000	0.000E+00	0.0000	1.636E-03	0.0000	8.466E-05	0.0000	1.121E-03	0.0000	4.957E-06	0.0000
Ni-63	0.000E+00	0.0000	4.158E-09	0.0000	0.000E+00	0.0000	6.132E-04	0.0000	3.173E-05	0.0000	4.203E-04	0.0000	1.858E-06	0.0000
Np-237	2.143E-02	0.0000	7.807E-05	0.0000	0.000E+00	0.0000	4.128E-01	0.0006	7.733E-03	0.0000	1.100E-04	0.0000	3.127E-03	0.0000
Pu-239	2.342E-06	0.0000	2.482E-05	0.0000	0.000E+00	0.0000	6.593E-03	0.0000	1.272E-04	0.0000	4.320E-06	0.0000	9.976E-04	0.0000
Pu-241	9.454E-06	0.0000	1.094E-05	0.0000	0.000E+00	0.0000	2.923E-03	0.0000	8.144E-05	0.0000	1.993E-06	0.0000	4.422E-04	0.0000
Sb-125	1.403E-01	0.0002	5.946E-09	0.0000	0.000E+00	0.0000	5.123E-04	0.0000	1.714E-05	0.0000	4.360E-06	0.0000	7.621E-06	0.0000
Sr-90	3.693E-02	0.0001	1.473E-05	0.0000	0.000E+00	0.0000	1.661E+01	0.0259	7.595E-01	0.0012	7.897E-01	0.0012	8.379E-03	0.0000
Tc-99	1.467E-05	0.0000	7.107E-09	0.0000	0.000E+00	0.0000	2.005E-01	0.0003	9.679E-05	0.0000	4.361E-03	0.0000	6.069E-06	0.0000
[illegible]	5.116E-03	0.0000	1.216E-02	0.0000	0.000E+00	0.0000	2.097E+00	0.0033	8.309E-02	0.0001	3.463E-01	0.0005	1.270E-01	0.0002
[illegible]	3.328E-01	0.0005	3.983E-04	0.0000	0.000E+00	0.0000	6.965E-02	0.0001	2.772E-03	0.0000	1.148E-02	0.0000	4.214E-03	0.0000
U-238	2.475E-02	0.0000	1.433E-04	0.0000	0.000E+00	0.0000	2.627E-02	0.0000	1.041E-03	0.0000	4.338E-03	0.0000	1.591E-03	0.0000
Total	2.771E+01	0.0432	2.316E-02	0.0000	0.000E+00	0.0000	2.457E+01	0.0383	2.250E+00	0.0035	2.893E+00	0.0045	1.691E-01	0.0003

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-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	7.804E-02	0.0001	1.509E-04	0.0000	0.000E+00	0.0000	4.395E-02	0.0001	5.526E-05	0.0000	1.234E-05	0.0000	1.305E-01	0.0002
C-14	4.889E-04	0.0000	1.616E-03	0.0000	0.000E+00	0.0000	7.990E-04	0.0000	4.179E-04	0.0000	6.291E-04	0.0000	3.824E-01	0.0006
Cm-243	2.959E-02	0.0000	5.721E-05	0.0000	0.000E+00	0.0000	1.667E-02	0.0000	8.363E-06	0.0000	4.681E-06	0.0000	5.128E-02	0.0001
Co-60	6.805E-01	0.0011	1.316E-02	0.0000	0.000E+00	0.0000	3.899E-01	0.0006	1.932E-01	0.0003	1.078E-01	0.0002	7.329E+00	0.0114
Cs-137	5.733E+01	0.0893	7.392E+00	0.0115	0.000E+00	0.0000	3.258E+01	0.0508	2.445E+01	0.0381	3.635E+01	0.0566	1.843E+02	0.2871
Eu-155	2.045E-04	0.0000	6.588E-07	0.0000	0.000E+00	0.0000	1.152E-04	0.0000	5.792E-06	0.0000	3.234E-07	0.0000	8.461E-03	0.0000
H-3	1.266E+00	0.0020	8.303E-05	0.0000	0.000E+00	0.0000	6.131E-01	0.0010	9.330E-02	0.0001	2.878E-01	0.0004	2.723E+00	0.0042
I-129	9.892E+01	0.1541	2.551E-01	0.0004	0.000E+00	0.0000	5.599E+01	0.0872	9.868E+00	0.0154	7.848E+01	0.1222	2.458E+02	0.3828
Nb-94	5.242E-04	0.0000	1.013E-05	0.0000	0.000E+00	0.0000	2.958E-04	0.0000	2.228E-09	0.0000	8.293E-08	0.0000	1.869E-01	0.0003
Ni-59	5.211E-03	0.0000	3.356E-05	0.0000	0.000E+00	0.0000	2.967E-03	0.0000	3.696E-04	0.0000	8.251E-03	0.0000	1.968E-02	0.0000
Ni-63	1.953E-03	0.0000	1.259E-05	0.0000	0.000E+00	0.0000	1.112E-03	0.0000	1.385E-04	0.0000	3.093E-03	0.0000	7.376E-03	0.0000
Np-237	4.115E-01	0.0006	7.954E-04	0.0000	0.000E+00	0.0000	2.327E-01	0.0004	5.830E-03	0.0000	1.628E-04	0.0000	1.096E+00	0.0017
Pu-239	2.081E-02	0.0000	4.023E-05	0.0000	0.000E+00	0.0000	1.172E-02	0.0000	2.947E-05	0.0000	1.646E-06	0.0000	4.041E-02	0.0001
Pu-241	1.301E-02	0.0000	2.509E-05	0.0000	0.000E+00	0.0000	7.307E-03	0.0000	1.534E-05	0.0000	1.341E-06	0.0000	2.383E-02	0.0000
Sb-125	1.020E+00	0.0016	6.634E-03	0.0000	0.000E+00	0.0000	5.825E-01	0.0009	1.556E-02	0.0000	8.369E-03	0.0000	1.774E+00	0.0028
Sr-90	7.570E+01	0.1179	2.929E-01	0.0005	0.000E+00	0.0000	4.545E+01	0.0708	8.670E+00	0.0135	1.206E+01	0.0188	1.604E+02	0.2498
Tc-99	3.773E-02	0.0001	4.865E-05	0.0000	0.000E+00	0.0000	4.448E-02	0.0001	5.849E-05	0.0000	3.210E-03	0.0000	2.905E-01	0.0005
[illegible]-94	2.029E+01	0.0316	1.308E-02	0.0000	0.000E+00	0.0000	1.143E+01	0.0178	9.772E-02	0.0002	9.630E-01	0.0015	3.547E+01	0.0553
[illegible]	6.766E-01	0.0011	4.360E-04	0.0000	0.000E+00	0.0000	3.812E-01	0.0006	3.471E-03	0.0000	3.193E-02	0.0000	1.515E+00	0.0024
U-238	2.542E-01	0.0004	1.638E-04	0.0000	0.000E+00	0.0000	1.432E-01	0.0002	1.224E-03	0.0000	1.206E-02	0.0000	4.690E-01	0.0007
Total	2.567E+02	0.3999	7.976E+00	0.0124	0.000E+00	0.0000	1.479E+02	0.2304	4.340E+01	0.0676	1.283E+02	0.1999	6.420E+02	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-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	3.470E-04	0.0000	2.561E-05	0.0000	0.000E+00	0.0000	6.759E-03	0.0000	9.597E-05	0.0000	8.857E-06	0.0000	1.023E-03	0.0000
C-14	6.108E-08	0.0000	4.378E-06	0.0000	0.000E+00	0.0000	2.373E-02	0.0000	1.243E-02	0.0000	7.321E-03	0.0000	3.339E-07	0.0000
Cm-243	2.206E-03	0.0000	8.557E-06	0.0000	0.000E+00	0.0000	2.252E-03	0.0000	1.279E-05	0.0000	2.951E-06	0.0000	3.408E-04	0.0000
Co-60	4.962E+00	0.0082	5.020E-07	0.0000	0.000E+00	0.0000	1.587E-01	0.0003	2.620E-02	0.0000	9.367E-03	0.0000	3.004E-04	0.0000
Cs-137	2.017E+01	0.0334	1.422E-06	0.0000	0.000E+00	0.0000	2.869E+00	0.0047	1.013E+00	0.0017	8.601E-01	0.0014	1.086E-02	0.0000
Eu-155	7.025E-03	0.0000	1.165E-08	0.0000	0.000E+00	0.0000	3.464E-05	0.0000	8.073E-06	0.0000	1.907E-07	0.0000	2.098E-06	0.0000
H-3	0.000E+00	0.0000	2.374E-03	0.0000	0.000E+00	0.0000	8.967E-02	0.0001	5.598E-03	0.0000	1.126E-02	0.0000	4.266E-06	0.0000
I-129	1.297E-02	0.0000	1.236E-06	0.0000	0.000E+00	0.0000	1.264E+00	0.0021	1.662E-01	0.0003	6.743E-01	0.0011	9.551E-03	0.0000
Nb-94	1.856E-01	0.0003	5.982E-08	0.0000	0.000E+00	0.0000	3.318E-04	0.0000	3.255E-09	0.0000	5.641E-08	0.0000	5.026E-06	0.0000
Ni-59	0.000E+00	0.0000	1.301E-08	0.0000	0.000E+00	0.0000	1.627E-03	0.0000	8.418E-05	0.0000	1.115E-03	0.0000	4.929E-06	0.0000
Ni-63	0.000E+00	0.0000	4.104E-09	0.0000	0.000E+00	0.0000	6.054E-04	0.0000	3.132E-05	0.0000	4.149E-04	0.0000	1.834E-06	0.0000
Np-237	2.142E-02	0.0000	7.801E-05	0.0000	0.000E+00	0.0000	4.125E-01	0.0007	7.727E-03	0.0000	1.099E-04	0.0000	3.125E-03	0.0000
Pu-239	2.342E-06	0.0000	2.481E-05	0.0000	0.000E+00	0.0000	6.592E-03	0.0000	1.872E-04	0.0000	4.319E-06	0.0000	9.974E-04	0.0000
Pu-241	2.125E-05	0.0000	1.133E-05	0.0000	0.000E+00	0.0000	3.023E-03	0.0000	8.102E-05	0.0000	2.212E-06	0.0000	4.575E-04	0.0000
Sb-125	5.412E-02	0.0001	2.294E-09	0.0000	0.000E+00	0.0000	1.986E-04	0.0000	6.682E-06	0.0000	1.691E-06	0.0000	2.939E-06	0.0000
Sr-90	3.433E-02	0.0001	1.369E-05	0.0000	0.000E+00	0.0000	1.545E+01	0.0256	7.069E-01	0.0012	7.348E-01	0.0012	7.791E-03	0.0000
Tc-99	1.419E-05	0.0000	6.871E-09	0.0000	0.000E+00	0.0000	1.938E-01	0.0003	9.366E-05	0.0000	4.219E-03	0.0000	5.867E-06	0.0000
[illegible]	5.112E-03	0.0000	1.215E-02	0.0000	0.000E+00	0.0000	2.095E+00	0.0035	8.302E-02	0.0001	3.460E-01	0.0006	1.269E-01	0.0002
[illegible]	3.325E-01	0.0006	3.981E-04	0.0000	0.000E+00	0.0000	6.982E-02	0.0001	2.807E-03	0.0000	1.147E-02	0.0000	4.214E-03	0.0000
U-238	2.473E-02	0.0000	1.432E-04	0.0000	0.000E+00	0.0000	2.625E-02	0.0000	1.040E-03	0.0000	4.334E-03	0.0000	1.590E-03	0.0000
Total	2.581E+01	0.0427	1.524E-02	0.0000	0.000E+00	0.0000	2.267E+01	0.0375	2.025E+00	0.0034	2.665E+00	0.0044	1.672E-01	0.0003

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-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	7.785E-02	0.0001	1.505E-04	0.0000	0.000E+00	0.0000	4.385E-02	0.0001	5.513E-05	0.0000	1.231E-05	0.0000	1.302E-01	0.0002
C-14	5.313E-05	0.0000	1.776E-04	0.0000	0.000E+00	0.0000	8.898E-05	0.0000	4.855E-05	0.0000	6.943E-05	0.0000	4.393E-02	0.0001
Cm-243	2.886E-02	0.0000	5.579E-05	0.0000	0.000E+00	0.0000	1.625E-02	0.0000	8.176E-06	0.0000	4.565E-06	0.0000	5.001E-02	0.0001
Co-60	5.901E-01	0.0010	1.141E-02	0.0000	0.000E+00	0.0000	3.382E-01	0.0006	1.676E-01	0.0003	9.351E-02	0.0002	6.358E+00	0.0105
Cs-137	5.450E+01	0.0902	7.026E+00	0.0116	0.000E+00	0.0000	3.097E+01	0.0513	2.325E+01	0.0385	3.456E+01	0.0572	1.752E+02	0.2900
Eu-155	1.777E-04	0.0000	5.724E-07	0.0000	0.000E+00	0.0000	1.001E-04	0.0000	5.033E-06	0.0000	2.810E-07	0.0000	7.354E-03	0.0000
H-3	2.934E-01	0.0005	1.935E-05	0.0000	0.000E+00	0.0000	1.436E-01	0.0002	2.218E-02	0.0000	6.707E-02	0.0001	6.352E-01	0.0011
I-129	9.375E+01	0.1551	2.418E-01	0.0004	0.000E+00	0.0000	5.306E+01	0.0878	9.362E+00	0.0155	7.442E+01	0.1231	2.330E+02	0.3855
Nb-94	5.238E-04	0.0000	1.012E-05	0.0000	0.000E+00	0.0000	2.956E-04	0.0000	2.226E-09	0.0000	8.286E-08	0.0000	1.868E-01	0.0003
Ni-59	5.180E-03	0.0000	3.338E-05	0.0000	0.000E+00	0.0000	2.949E-03	0.0000	3.674E-04	0.0000	8.201E-03	0.0000	1.956E-02	0.0000
Ni-63	1.927E-03	0.0000	1.242E-05	0.0000	0.000E+00	0.0000	1.097E-03	0.0000	1.367E-04	0.0000	3.052E-03	0.0000	7.279E-03	0.0000
Np-237	4.110E-01	0.0007	7.946E-04	0.0000	0.000E+00	0.0000	2.325E-01	0.0004	5.824E-03	0.0000	1.627E-04	0.0000	1.095E+00	0.0018
Pu-239	2.080E-02	0.0000	4.021E-05	0.0000	0.000E+00	0.0000	1.172E-02	0.0000	2.946E-05	0.0000	1.645E-06	0.0000	4.040E-02	0.0001
Pu-241	1.527E-02	0.0000	2.945E-05	0.0000	0.000E+00	0.0000	8.576E-03	0.0000	1.663E-05	0.0000	1.729E-06	0.0000	2.749E-02	0.0000
Sb-125	3.935E-01	0.0007	2.565E-03	0.0000	0.000E+00	0.0000	2.254E-01	0.0004	6.114E-03	0.0000	3.259E-03	0.0000	6.852E-01	0.0011
Sr-90	7.036E+01	0.1164	2.722E-01	0.0005	0.000E+00	0.0000	4.225E+01	0.0699	8.066E+00	0.0133	1.121E+01	0.0186	1.491E+02	0.2467
Tc-99	3.647E-02	0.0001	4.702E-05	0.0000	0.000E+00	0.0000	4.299E-02	0.0001	5.657E-05	0.0000	3.103E-03	0.0000	2.808E-01	0.0005
[illegible]34	2.027E+01	0.0335	1.306E-02	0.0000	0.000E+00	0.0000	1.142E+01	0.0189	9.761E-02	0.0002	9.618E-01	0.0016	3.543E+01	0.0586
[illegible]	6.786E-01	0.0011	4.375E-04	0.0000	0.000E+00	0.0000	3.823E-01	0.0006	3.633E-03	0.0000	3.189E-02	0.0001	1.518E+00	0.0025
U-238	2.539E-01	0.0004	1.636E-04	0.0000	0.000E+00	0.0000	1.430E-01	0.0002	1.223E-03	0.0000	1.205E-02	0.0000	4.685E-01	0.0008
Total	2.417E+02	0.3999	7.569E+00	0.0125	0.000E+00	0.0000	1.393E+02	0.2305	4.099E+01	0.0678	1.214E+02	0.2009	6.043E+02	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-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	3.456E-04	0.0000	2.550E-05	0.0000	0.000E+00	0.0000	6.732E-03	0.0000	9.558E-05	0.0000	8.821E-06	0.0000	1.019E-03	0.0000
C-14	7.171E-10	0.0000	5.140E-08	0.0000	0.000E+00	0.0000	2.787E-04	0.0000	1.460E-04	0.0000	8.599E-05	0.0000	3.920E-09	0.0000
Cm-243	2.099E-03	0.0000	8.144E-06	0.0000	0.000E+00	0.0000	2.144E-03	0.0000	1.218E-05	0.0000	2.809E-06	0.0000	3.244E-04	0.0000
Co-60	3.734E+00	0.0069	3.777E-07	0.0000	0.000E+00	0.0000	1.194E-01	0.0002	1.971E-02	0.0000	7.048E-03	0.0000	2.260E-04	0.0000
Cs-137	1.824E+01	0.0337	1.286E-06	0.0000	0.000E+00	0.0000	2.594E+00	0.0048	9.156E-01	0.0017	7.777E-01	0.0014	9.817E-03	0.0000
Eu-155	5.307E-03	0.0000	8.804E-09	0.0000	0.000E+00	0.0000	2.617E-05	0.0000	6.099E-06	0.0000	1.440E-07	0.0000	1.585E-06	0.0000
H-3	0.000E+00	0.0000	1.272E-04	0.0000	0.000E+00	0.0000	4.805E-03	0.0000	3.000E-04	0.0000	6.033E-04	0.0000	2.286E-07	0.0000
I-129	1.165E-02	0.0000	1.111E-06	0.0000	0.000E+00	0.0000	1.136E+00	0.0021	1.494E-01	0.0003	6.061E-01	0.0011	8.585E-03	0.0000
Nb-94	1.854E-01	0.0003	5.975E-08	0.0000	0.000E+00	0.0000	3.314E-04	0.0000	3.251E-09	0.0000	5.634E-08	0.0000	5.020E-06	0.0000
Ni-59	0.000E+00	0.0000	1.266E-08	0.0000	0.000E+00	0.0000	1.608E-03	0.0000	8.322E-05	0.0000	1.102E-03	0.0000	4.873E-06	0.0000
Ni-63	0.000E+00	0.0000	3.999E-09	0.0000	0.000E+00	0.0000	5.899E-04	0.0000	3.052E-05	0.0000	4.043E-04	0.0000	1.787E-06	0.0000
Np-237	2.139E-02	0.0000	7.790E-05	0.0000	0.000E+00	0.0000	4.119E-01	0.0008	7.716E-03	0.0000	1.098E-04	0.0000	3.120E-03	0.0000
Pu-239	2.341E-06	0.0000	2.480E-05	0.0000	0.000E+00	0.0000	6.590E-03	0.0000	1.871E-04	0.0000	4.318E-06	0.0000	9.971E-04	0.0000
Pu-241	4.312E-05	0.0000	1.204E-05	0.0000	0.000E+00	0.0000	3.209E-03	0.0000	8.015E-05	0.0000	2.616E-06	0.0000	4.856E-04	0.0000
Sb-125	8.052E-03	0.0000	3.412E-10	0.0000	0.000E+00	0.0000	2.954E-05	0.0000	9.941E-07	0.0000	2.515E-07	0.0000	4.373E-07	0.0000
Sr-90	2.968E-02	0.0001	1.184E-05	0.0000	0.000E+00	0.0000	1.335E+01	0.0247	6.111E-01	0.0011	6.352E-01	0.0012	6.734E-03	0.0000
Tc-99	1.326E-05	0.0000	6.422E-09	0.0000	0.000E+00	0.0000	1.812E-01	0.0003	8.754E-05	0.0000	3.943E-03	0.0000	5.484E-06	0.0000
[illegible]-234	5.107E-03	0.0000	1.213E-02	0.0000	0.000E+00	0.0000	2.092E+00	0.0039	8.288E-02	0.0002	3.454E-01	0.0006	1.267E-01	0.0002
[illegible]	3.319E-01	0.0006	3.976E-04	0.0000	0.000E+00	0.0000	7.018E-02	0.0001	2.878E-03	0.0000	1.145E-02	0.0000	4.214E-03	0.0000
U-238	2.469E-02	0.0000	1.429E-04	0.0000	0.000E+00	0.0000	2.620E-02	0.0000	1.038E-03	0.0000	4.327E-03	0.0000	1.587E-03	0.0000
Total	2.260E+01	0.0418	1.296E-02	0.0000	0.000E+00	0.0000	2.001E+01	0.0370	1.791E+00	0.0033	2.393E+00	0.0044	1.638E-01	0.0003

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-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	7.749E-02	0.0001	1.498E-04	0.0000	0.000E+00	0.0000	4.364E-02	0.0001	5.488E-05	0.0000	1.226E-05	0.0000	1.296E-01	0.0002
C-14	6.227E-07	0.0000	2.082E-06	0.0000	0.000E+00	0.0000	1.043E-06	0.0000	5.691E-07	0.0000	8.139E-07	0.0000	5.159E-04	0.0000
Cm-243	2.745E-02	0.0001	5.306E-05	0.0000	0.000E+00	0.0000	1.546E-02	0.0000	7.777E-06	0.0000	4.341E-06	0.0000	4.756E-02	0.0001
Co-60	4.437E-01	0.0008	8.579E-03	0.0000	0.000E+00	0.0000	2.543E-01	0.0005	1.260E-01	0.0002	7.031E-02	0.0001	4.783E+00	0.0088
Cs-137	4.924E+01	0.0911	6.348E+00	0.0117	0.000E+00	0.0000	2.798E+01	0.0518	2.101E+01	0.0389	3.123E+01	0.0578	1.583E+02	0.2930
Eu-155	1.341E-04	0.0000	4.322E-07	0.0000	0.000E+00	0.0000	7.557E-05	0.0000	3.800E-06	0.0000	2.122E-07	0.0000	5.555E-03	0.0000
H-3	1.570E-02	0.0000	1.036E-06	0.0000	0.000E+00	0.0000	7.687E-03	0.0000	1.187E-03	0.0000	3.590E-03	0.0000	3.401E-02	0.0001
I-129	8.421E+01	0.1558	2.172E-01	0.0004	0.000E+00	0.0000	4.768E+01	0.0882	8.410E+00	0.0156	6.685E+01	0.1237	2.093E+02	0.3872
Nb-94	5.228E-04	0.0000	1.011E-05	0.0000	0.000E+00	0.0000	2.950E-04	0.0000	2.222E-09	0.0000	8.270E-08	0.0000	1.866E-01	0.0003
Ni-59	5.117E-03	0.0000	3.298E-05	0.0000	0.000E+00	0.0000	2.913E-03	0.0000	3.629E-04	0.0000	8.103E-03	0.0000	1.933E-02	0.0000
Ni-63	1.877E-03	0.0000	1.210E-05	0.0000	0.000E+00	0.0000	1.069E-03	0.0000	1.331E-04	0.0000	2.972E-03	0.0000	7.089E-03	0.0000
Np-237	4.102E-01	0.0008	7.929E-04	0.0000	0.000E+00	0.0000	2.320E-01	0.0004	5.811E-03	0.0000	1.624E-04	0.0000	1.093E+00	0.0020
Pu-239	2.078E-02	0.0000	4.017E-05	0.0000	0.000E+00	0.0000	1.170E-02	0.0000	2.943E-05	0.0000	1.643E-06	0.0000	4.036E-02	0.0001
Pu-241	1.945E-02	0.0000	3.754E-05	0.0000	0.000E+00	0.0000	1.093E-02	0.0000	1.905E-05	0.0000	2.454E-06	0.0000	3.427E-02	0.0001
Sb-125	5.850E-02	0.0001	3.814E-04	0.0000	0.000E+00	0.0000	3.351E-02	0.0001	9.091E-04	0.0000	4.846E-04	0.0000	1.019E-01	0.0002
Sr-90	6.078E+01	0.1124	2.352E-01	0.0004	0.000E+00	0.0000	3.650E+01	0.0675	6.967E+00	0.0129	9.686E+00	0.0179	1.288E+02	0.2383
Tc-99	3.406E-02	0.0001	4.392E-05	0.0000	0.000E+00	0.0000	4.016E-02	0.0001	5.284E-05	0.0000	2.898E-03	0.0000	2.624E-01	0.0005
[illegible]-234	2.022E+01	0.0374	1.303E-02	0.0000	0.000E+00	0.0000	1.139E+01	0.0211	9.737E-02	0.0002	9.595E-01	0.0018	3.535E+01	0.0654
[illegible]	6.834E-01	0.0013	4.411E-04	0.0000	0.000E+00	0.0000	3.850E-01	0.0007	3.959E-03	0.0000	3.182E-02	0.0001	1.526E+00	0.0028
U-238	2.533E-01	0.0005	1.632E-04	0.0000	0.000E+00	0.0000	1.427E-01	0.0003	1.220E-03	0.0000	1.202E-02	0.0000	4.674E-01	0.0009
Total	2.165E+02	0.4006	6.825E+00	0.0126	0.000E+00	0.0000	1.247E+02	0.2308	3.662E+01	0.0678	1.089E+02	0.2014	5.405E+02	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-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	3.408E-04	0.0000	2.515E-05	0.0000	0.000E+00	0.0000	6.638E-03	0.0000	9.425E-05	0.0000	8.698E-06	0.0000	1.004E-03	0.0000
C-14	1.198E-16	0.0000	8.588E-15	0.0000	0.000E+00	0.0000	4.658E-11	0.0000	2.444E-11	0.0000	1.439E-11	0.0000	6.549E-16	0.0000
Cm-243	1.765E-03	0.0000	6.849E-06	0.0000	0.000E+00	0.0000	1.803E-03	0.0000	1.026E-05	0.0000	2.362E-06	0.0000	2.728E-04	0.0000
Co-60	1.380E+00	0.0037	1.396E-07	0.0000	0.000E+00	0.0000	4.412E-02	0.0001	7.285E-03	0.0000	2.605E-03	0.0000	8.353E-05	0.0000
Cs-137	1.282E+01	0.0344	9.034E-07	0.0000	0.000E+00	0.0000	1.823E+00	0.0049	6.434E-01	0.0017	5.465E-01	0.0015	6.898E-03	0.0000
Eu-155	1.989E-03	0.0000	3.299E-09	0.0000	0.000E+00	0.0000	9.807E-06	0.0000	2.286E-06	0.0000	5.398E-08	0.0000	5.940E-07	0.0000
H-3	0.000E+00	0.0000	4.461E-09	0.0000	0.000E+00	0.0000	1.685E-07	0.0000	1.053E-08	0.0000	2.117E-08	0.0000	8.016E-12	0.0000
I-129	8.024E-03	0.0000	7.650E-07	0.0000	0.000E+00	0.0000	7.821E-01	0.0021	1.026E-01	0.0003	4.173E-01	0.0011	5.911E-03	0.0000
Nb-94	1.846E-01	0.0005	5.950E-08	0.0000	0.000E+00	0.0000	3.300E-04	0.0000	3.238E-09	0.0000	5.610E-08	0.0000	4.999E-06	0.0000
Ni-59	0.000E+00	0.0000	1.235E-08	0.0000	0.000E+00	0.0000	1.545E-03	0.0000	7.995E-05	0.0000	1.059E-03	0.0000	4.681E-06	0.0000
Ni-63	0.000E+00	0.0000	3.653E-09	0.0000	0.000E+00	0.0000	5.388E-04	0.0000	2.788E-05	0.0000	3.693E-04	0.0000	1.632E-06	0.0000
Np-237	2.128E-02	0.0001	7.751E-05	0.0000	0.000E+00	0.0000	4.099E-01	0.0011	7.677E-03	0.0000	1.092E-04	0.0000	3.105E-03	0.0000
Pu-239	2.339E-06	0.0000	2.478E-05	0.0000	0.000E+00	0.0000	6.583E-03	0.0000	1.869E-04	0.0000	4.313E-06	0.0000	9.962E-04	0.0000
Pu-241	1.043E-04	0.0000	1.402E-05	0.0000	0.000E+00	0.0000	3.722E-03	0.0000	7.752E-05	0.0000	3.743E-06	0.0000	5.631E-04	0.0000
Sb-125	1.023E-05	0.0000	4.334E-13	0.0000	0.000E+00	0.0000	3.752E-08	0.0000	1.263E-09	0.0000	3.194E-10	0.0000	5.554E-10	0.0000
Sr-90	1.782E-02	0.0000	7.107E-06	0.0000	0.000E+00	0.0000	8.019E+00	0.0215	3.669E-01	0.0010	3.814E-01	0.0010	4.044E-03	0.0000
Tc-99	1.046E-05	0.0000	5.069E-09	0.0000	0.000E+00	0.0000	1.430E-01	0.0004	6.909E-05	0.0000	3.112E-03	0.0000	4.328E-06	0.0000
[illegible]	5.102E-03	0.0000	1.206E-02	0.0000	0.000E+00	0.0000	2.079E+00	0.0056	8.238E-02	0.0002	3.433E-01	0.0009	1.260E-01	0.0003
[illegible]	3.300E-01	0.0009	3.964E-04	0.0000	0.000E+00	0.0000	7.145E-02	0.0002	3.122E-03	0.0000	1.138E-02	0.0000	4.219E-03	0.0000
U-238	2.454E-02	0.0001	1.421E-04	0.0000	0.000E+00	0.0000	2.604E-02	0.0001	1.032E-03	0.0000	4.301E-03	0.0000	1.578E-03	0.0000
Total	1.479E+01	0.0397	1.276E-02	0.0000	0.000E+00	0.0000	1.342E+01	0.0360	1.215E+00	0.0033	1.711E+00	0.0046	1.546E-01	0.0004

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.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	7.622E-02	0.0002	1.473E-04	0.0000	0.000E+00	0.0000	4.293E-02	0.0001	5.399E-05	0.0000	1.206E-05	0.0000	1.275E-01	0.0003
C-14	1.034E-13	0.0000	3.459E-13	0.0000	0.000E+00	0.0000	1.733E-13	0.0000	9.460E-14	0.0000	1.352E-13	0.0000	8.627E-11	0.0000
Cm-243	2.303E-02	0.0001	4.451E-05	0.0000	0.000E+00	0.0000	1.297E-02	0.0000	6.526E-06	0.0000	3.642E-06	0.0000	3.991E-02	0.0001
Co-60	1.636E-01	0.0004	3.163E-03	0.0000	0.000E+00	0.0000	9.376E-02	0.0003	4.647E-02	0.0001	2.593E-02	0.0001	1.767E+00	0.0047
Cs-137	3.452E+01	0.0926	4.451E+00	0.0119	0.000E+00	0.0000	1.962E+01	0.0527	1.473E+01	0.0395	2.189E+01	0.0588	1.110E+02	0.2980
Eu-155	5.015E-05	0.0000	1.616E-07	0.0000	0.000E+00	0.0000	2.826E-05	0.0000	1.421E-06	0.0000	7.933E-08	0.0000	2.082E-03	0.0000
H-3	5.489E-07	0.0000	3.621E-11	0.0000	0.000E+00	0.0000	2.687E-07	0.0000	4.150E-08	0.0000	1.255E-07	0.0000	1.189E-06	0.0000
I-129	5.765E+01	0.1553	1.492E-01	0.0004	0.000E+00	0.0000	3.275E+01	0.0879	5.777E+00	0.0155	4.592E+01	0.1232	1.438E+02	0.3858
Nb-94	5.194E-04	0.0000	1.004E-05	0.0000	0.000E+00	0.0000	2.931E-04	0.0000	2.207E-09	0.0000	8.216E-08	0.0000	1.858E-01	0.0005
Ni-59	4.904E-03	0.0000	3.161E-05	0.0000	0.000E+00	0.0000	2.792E-03	0.0000	3.479E-04	0.0000	7.766E-03	0.0000	1.853E-02	0.0000
Ni-63	1.710E-03	0.0000	1.102E-05	0.0000	0.000E+00	0.0000	9.737E-04	0.0000	1.213E-04	0.0000	2.708E-03	0.0000	6.462E-03	0.0000
Np-237	4.072E-01	0.0011	7.871E-04	0.0000	0.000E+00	0.0000	2.303E-01	0.0006	5.769E-03	0.0000	1.614E-04	0.0000	1.086E+00	0.0029
Pu-239	2.071E-02	0.0001	4.004E-05	0.0000	0.000E+00	0.0000	1.167E-02	0.0000	2.933E-05	0.0000	1.638E-06	0.0000	4.025E-02	0.0001
Pu-241	3.107E-02	0.0001	6.002E-05	0.0000	0.000E+00	0.0000	1.748E-02	0.0000	2.576E-05	0.0000	4.471E-06	0.0000	5.313E-02	0.0001
Sb-125	7.413E-05	0.0000	4.833E-07	0.0000	0.000E+00	0.0000	4.246E-05	0.0000	1.152E-06	0.0000	6.140E-07	0.0000	1.291E-04	0.0000
Sr-90	3.641E+01	0.0977	1.409E-01	0.0004	0.000E+00	0.0000	2.187E+01	0.0587	4.174E+00	0.0112	5.802E+00	0.0156	7.718E+01	0.2071
Tc-99	2.682E-02	0.0001	3.459E-05	0.0000	0.000E+00	0.0000	3.162E-02	0.0001	4.161E-05	0.0000	2.282E-03	0.0000	2.070E-01	0.0006
[illegible]	2.005E+01	0.0538	1.292E-02	0.0000	0.000E+00	0.0000	1.130E+01	0.0303	9.656E-02	0.0003	9.514E-01	0.0026	3.505E+01	0.0941
	7.060E-01	0.0019	4.595E-04	0.0000	0.000E+00	0.0000	3.977E-01	0.0011	5.076E-03	0.0000	3.158E-02	0.0001	1.561E+00	0.0042
U-238	2.512E-01	0.0007	1.618E-04	0.0000	0.000E+00	0.0000	1.415E-01	0.0004	1.210E-03	0.0000	1.192E-02	0.0000	4.636E-01	0.0012
Total	1.505E+02	0.4040	4.759E+00	0.0128	0.000E+00	0.0000	8.652E+01	0.2322	2.484E+01	0.0667	7.465E+01	0.2003	3.726E+02	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-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	3.274E-04	0.0000	2.415E-05	0.0000	0.000E+00	0.0000	6.376E-03	0.0000	9.054E-05	0.0000	8.354E-06	0.0000	9.646E-04	0.0000
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.349E-30	0.0000	7.107E-31	0.0000	4.176E-31	0.0000	0.000E+00	0.0000
Cm-243	1.075E-03	0.0000	4.178E-06	0.0000	0.000E+00	0.0000	1.100E-03	0.0000	6.292E-06	0.0000	1.440E-06	0.0000	1.664E-04	0.0000
Co-60	8.031E-02	0.0006	8.124E-09	0.0000	0.000E+00	0.0000	2.568E-03	0.0000	4.240E-04	0.0000	1.516E-04	0.0000	4.861E-06	0.0000
Cs-137	4.677E+00	0.0321	3.297E-07	0.0000	0.000E+00	0.0000	6.652E-01	0.0046	2.348E-01	0.0016	1.994E-01	0.0014	2.517E-03	0.0000
Eu-155	1.204E-04	0.0000	1.998E-10	0.0000	0.000E+00	0.0000	5.939E-07	0.0000	1.384E-07	0.0000	3.269E-09	0.0000	3.597E-08	0.0000
H-3	0.000E+00	0.0000	7.325E-22	0.0000	0.000E+00	0.0000	2.768E-20	0.0000	1.732E-21	0.0000	3.480E-21	0.0000	1.316E-24	0.0000
I-129	2.763E-03	0.0000	2.634E-07	0.0000	0.000E+00	0.0000	2.693E-01	0.0019	3.540E-02	0.0002	1.437E-01	0.0010	2.035E-03	0.0000
Nb-94	1.824E-01	0.0013	5.879E-08	0.0000	0.000E+00	0.0000	3.260E-04	0.0000	3.199E-09	0.0000	5.543E-08	0.0000	4.939E-06	0.0000
Ni-59	0.000E+00	0.0000	1.102E-08	0.0000	0.000E+00	0.0000	1.378E-03	0.0000	7.129E-05	0.0000	9.442E-04	0.0000	4.174E-06	0.0000
Ni-63	0.000E+00	0.0000	2.820E-09	0.0000	0.000E+00	0.0000	4.159E-04	0.0000	2.152E-05	0.0000	2.851E-04	0.0000	1.260E-06	0.0000
Np-237	2.098E-02	0.0001	7.641E-05	0.0000	0.000E+00	0.0000	4.040E-01	0.0028	7.568E-03	0.0001	1.077E-04	0.0000	3.061E-03	0.0000
Pu-239	2.333E-06	0.0000	2.471E-05	0.0000	0.000E+00	0.0000	6.565E-03	0.0000	1.864E-04	0.0000	4.301E-06	0.0000	9.933E-04	0.0000
Pu-241	1.939E-04	0.0000	1.671E-05	0.0000	0.000E+00	0.0000	4.420E-03	0.0000	7.217E-05	0.0000	5.360E-06	0.0000	6.688E-04	0.0000
Sb-125	5.431E-14	0.0000	2.302E-21	0.0000	0.000E+00	0.0000	1.992E-16	0.0000	6.705E-18	0.0000	1.697E-18	0.0000	2.950E-18	0.0000
Sr-90	4.150E-03	0.0000	1.655E-06	0.0000	0.000E+00	0.0000	1.867E+00	0.0128	8.544E-02	0.0006	8.881E-02	0.0006	9.416E-04	0.0000
Tc-99	5.323E-06	0.0000	2.578E-09	0.0000	0.000E+00	0.0000	7.273E-02	0.0005	3.515E-05	0.0000	1.583E-03	0.0000	2.202E-06	0.0000
[illegible]	5.229E-03	0.0000	1.186E-02	0.0001	0.000E+00	0.0000	2.044E+00	0.0141	8.096E-02	0.0006	3.374E-01	0.0023	1.238E-01	0.0009
	3.245E-01	0.0022	3.950E-04	0.0000	0.000E+00	0.0000	7.519E-02	0.0005	3.774E-03	0.0000	1.119E-02	0.0001	4.252E-03	0.0000
U-238	2.411E-02	0.0002	1.396E-04	0.0000	0.000E+00	0.0000	2.560E-02	0.0002	1.014E-03	0.0000	4.227E-03	0.0000	1.550E-03	0.0000
Total	5.323E+00	0.0366	1.254E-02	0.0001	0.000E+00	0.0000	5.446E+00	0.0374	4.499E-01	0.0031	7.878E-01	0.0054	1.410E-01	0.0010

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-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	7.272E-02	0.0005	1.406E-04	0.0000	0.000E+00	0.0000	4.096E-02	0.0003	5.152E-05	0.0000	1.150E-05	0.0000	1.217E-01	0.0008
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.477E-30	0.0000
Cm-243	1.394E-02	0.0001	2.695E-05	0.0000	0.000E+00	0.0000	7.851E-03	0.0001	3.958E-06	0.0000	2.204E-06	0.0000	2.418E-02	0.0002
Co-60	9.458E-03	0.0001	1.829E-04	0.0000	0.000E+00	0.0000	5.420E-03	0.0000	2.686E-03	0.0000	1.499E-03	0.0000	1.027E-01	0.0007
Cs-137	1.251E+01	0.0860	1.613E+00	0.0111	0.000E+00	0.0000	7.111E+00	0.0489	5.339E+00	0.0367	7.935E+00	0.0545	4.029E+01	0.2770
Eu-155	3.017E-06	0.0000	9.720E-09	0.0000	0.000E+00	0.0000	1.700E-06	0.0000	8.546E-08	0.0000	4.772E-09	0.0000	1.260E-04	0.0000
H-3	8.924E-20	0.0000	5.867E-24	0.0000	0.000E+00	0.0000	4.369E-20	0.0000	6.750E-21	0.0000	2.040E-20	0.0000	1.937E-19	0.0000
I-129	1.978E+01	0.1360	5.103E-02	0.0004	0.000E+00	0.0000	1.120E+01	0.0770	1.976E+00	0.0136	1.570E+01	0.1080	4.917E+01	0.3380
Nb-94	5.097E-04	0.0000	9.853E-06	0.0000	0.000E+00	0.0000	2.876E-04	0.0000	2.166E-09	0.0000	8.063E-08	0.0000	1.835E-01	0.0013
Ni-59	4.344E-03	0.0000	2.799E-05	0.0000	0.000E+00	0.0000	2.473E-03	0.0000	3.081E-04	0.0000	6.878E-03	0.0000	1.643E-02	0.0001
Ni-63	1.311E-03	0.0000	8.451E-06	0.0000	0.000E+00	0.0000	7.466E-04	0.0000	9.302E-05	0.0000	2.077E-03	0.0000	4.960E-03	0.0000
Np-237	3.987E-01	0.0027	7.707E-04	0.0000	0.000E+00	0.0000	2.255E-01	0.0016	5.649E-03	0.0000	1.585E-04	0.0000	1.067E+00	0.0073
Pu-239	2.052E-02	0.0001	3.966E-05	0.0000	0.000E+00	0.0000	1.155E-02	0.0001	2.905E-05	0.0000	1.622E-06	0.0000	3.992E-02	0.0003
Pu-241	4.762E-02	0.0003	9.204E-05	0.0000	0.000E+00	0.0000	2.681E-02	0.0002	3.515E-05	0.0000	7.365E-06	0.0000	7.995E-02	0.0005
Sb-125	3.911E-13	0.0000	2.549E-15	0.0000	0.000E+00	0.0000	2.240E-13	0.0000	6.077E-15	0.0000	3.239E-15	0.0000	6.815E-13	0.0000
Sr-90	8.421E+00	0.0579	3.258E-02	0.0002	0.000E+00	0.0000	5.057E+00	0.0348	9.654E-01	0.0066	1.342E+00	0.0092	1.787E+01	0.1228
Tc-99	1.355E-02	0.0001	1.747E-05	0.0000	0.000E+00	0.0000	1.598E-02	0.0001	2.102E-05	0.0000	1.153E-03	0.0000	1.051E-01	0.0007
[illegible]24	1.957E+01	0.1345	1.262E-02	0.0001	0.000E+00	0.0000	1.103E+01	0.0758	9.426E-02	0.0006	9.288E-01	0.0064	3.424E+01	0.2354
[illegible]	8.015E-01	0.0055	5.432E-04	0.0000	0.000E+00	0.0000	4.516E-01	0.0031	8.052E-03	0.0001	3.095E-02	0.0002	1.712E+00	0.0118
U-238	2.452E-01	0.0017	1.580E-04	0.0000	0.000E+00	0.0000	1.381E-01	0.0009	1.181E-03	0.0000	1.164E-02	0.0001	4.530E-01	0.0031
Total	6.192E+01	0.4256	1.712E+00	0.0118	0.000E+00	0.0000	3.532E+01	0.2428	8.392E+00	0.0577	2.596E+01	0.1785	1.455E+02	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-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	2.844E-04	0.0000	2.097E-05	0.0000	0.000E+00	0.0000	5.540E-03	0.0001	7.867E-05	0.0000	7.254E-06	0.0000	8.375E-04	0.0000
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cm-243	1.897E-04	0.0000	7.489E-07	0.0000	0.000E+00	0.0000	1.972E-04	0.0000	1.199E-06	0.0000	2.561E-07	0.0000	2.983E-05	0.0000
Co-60	3.819E-06	0.0000	3.863E-13	0.0000	0.000E+00	0.0000	1.221E-07	0.0000	2.016E-08	0.0000	7.208E-09	0.0000	2.312E-10	0.0000
Cs-137	1.373E-01	0.0036	9.678E-09	0.0000	0.000E+00	0.0000	1.953E-02	0.0005	6.892E-03	0.0002	5.854E-03	0.0002	7.390E-05	0.0000
Eu-155	6.582E-09	0.0000	1.092E-14	0.0000	0.000E+00	0.0000	3.245E-11	0.0000	7.563E-12	0.0000	1.786E-13	0.0000	1.966E-12	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	6.615E-05	0.0000	6.307E-09	0.0000	0.000E+00	0.0000	6.448E-03	0.0002	8.478E-04	0.0000	3.441E-03	0.0001	4.873E-05	0.0000
Nb-94	1.749E-01	0.0046	5.636E-08	0.0000	0.000E+00	0.0000	3.126E-04	0.0000	3.067E-09	0.0000	5.314E-08	0.0000	4.735E-06	0.0000
Ni-59	0.000E+00	0.0000	7.375E-09	0.0000	0.000E+00	0.0000	9.224E-04	0.0000	4.773E-05	0.0000	6.322E-04	0.0000	2.795E-06	0.0000
Ni-63	0.000E+00	0.0000	1.140E-09	0.0000	0.000E+00	0.0000	1.681E-04	0.0000	8.698E-06	0.0000	1.152E-04	0.0000	5.093E-07	0.0000
Np-237	1.995E-02	0.0005	7.268E-05	0.0000	0.000E+00	0.0000	3.843E-01	0.0101	7.198E-03	0.0002	1.026E-04	0.0000	2.911E-03	0.0001
Pu-239	2.310E-06	0.0000	2.446E-05	0.0000	0.000E+00	0.0000	6.500E-03	0.0002	1.846E-04	0.0000	4.258E-06	0.0000	9.835E-04	0.0000
Pu-241	2.198E-04	0.0000	1.629E-05	0.0000	0.000E+00	0.0000	4.304E-03	0.0001	6.144E-05	0.0000	5.622E-06	0.0000	6.508E-04	0.0000
Sb-125	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	2.528E-05	0.0000	1.008E-08	0.0000	0.000E+00	0.0000	1.138E-02	0.0003	5.206E-04	0.0000	5.411E-04	0.0000	5.737E-06	0.0000
Tc-99	4.997E-07	0.0000	2.420E-10	0.0000	0.000E+00	0.0000	6.827E-03	0.0002	3.299E-06	0.0000	1.486E-04	0.0000	2.067E-07	0.0000
[illegible]-1	7.093E-03	0.0002	1.117E-02	0.0003	0.000E+00	0.0000	1.928E+00	0.0506	7.628E-02	0.0020	3.175E-01	0.0083	1.167E-01	0.0031
[illegible]	3.061E-01	0.0080	3.949E-04	0.0000	0.000E+00	0.0000	8.652E-02	0.0023	5.604E-03	0.0001	1.056E-02	0.0003	4.389E-03	0.0001
U-238	2.269E-02	0.0006	1.314E-04	0.0000	0.000E+00	0.0000	2.409E-02	0.0006	9.544E-04	0.0000	3.978E-03	0.0001	1.459E-03	0.0000
Total	6.688E-01	0.0176	1.183E-02	0.0003	0.000E+00	0.0000	2.485E+00	0.0652	9.868E-02	0.0026	3.429E-01	0.0090	1.281E-01	0.0034

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-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	6.165E-02	0.0016	1.192E-04	0.0000	0.000E+00	0.0000	3.472E-02	0.0009	4.372E-05	0.0000	9.753E-06	0.0000	1.033E-01	0.0027
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cm-243	2.415E-03	0.0001	4.667E-06	0.0000	0.000E+00	0.0000	1.360E-03	0.0000	6.979E-07	0.0000	3.810E-07	0.0000	4.199E-03	0.0001
Co-60	4.391E-07	0.0000	8.490E-09	0.0000	0.000E+00	0.0000	2.516E-07	0.0000	1.247E-07	0.0000	6.958E-08	0.0000	4.862E-06	0.0000
Cs-137	3.587E-01	0.0094	4.624E-02	0.0012	0.000E+00	0.0000	2.038E-01	0.0053	1.530E-01	0.0040	2.274E-01	0.0060	1.159E+00	0.0304
Eu-155	1.610E-10	0.0000	5.186E-13	0.0000	0.000E+00	0.0000	9.069E-11	0.0000	4.560E-12	0.0000	2.546E-13	0.0000	6.881E-09	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	4.625E-01	0.0121	1.193E-03	0.0000	0.000E+00	0.0000	2.619E-01	0.0069	4.619E-02	0.0012	3.672E-01	0.0096	1.150E+00	0.0302
Nb-94	4.772E-04	0.0000	9.224E-06	0.0000	0.000E+00	0.0000	2.693E-04	0.0000	2.028E-09	0.0000	7.548E-08	0.0000	1.760E-01	0.0046
Ni-59	2.840E-03	0.0001	1.830E-05	0.0000	0.000E+00	0.0000	1.617E-03	0.0000	2.014E-04	0.0000	4.496E-03	0.0001	1.078E-02	0.0003
Ni-63	5.175E-04	0.0000	3.335E-06	0.0000	0.000E+00	0.0000	2.946E-04	0.0000	3.670E-05	0.0000	8.194E-04	0.0000	1.964E-03	0.0001
Np-237	3.703E-01	0.0097	7.157E-04	0.0000	0.000E+00	0.0000	2.094E-01	0.0055	5.246E-03	0.0001	1.487E-04	0.0000	1.000E+00	0.0263
Pu-239	1.983E-02	0.0005	3.834E-05	0.0000	0.000E+00	0.0000	1.117E-02	0.0003	2.809E-05	0.0000	1.568E-06	0.0000	3.877E-02	0.0010
Pu-241	5.000E-02	0.0013	9.666E-05	0.0000	0.000E+00	0.0000	2.816E-02	0.0007	3.549E-05	0.0000	7.904E-06	0.0000	8.356E-02	0.0022
Sb-125	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	5.010E-02	0.0013	1.938E-04	0.0000	0.000E+00	0.0000	3.009E-02	0.0008	5.743E-03	0.0002	7.984E-03	0.0002	1.066E-01	0.0028
Tc-99	1.242E-03	0.0000	1.602E-06	0.0000	0.000E+00	0.0000	1.464E-03	0.0000	1.927E-06	0.0000	1.057E-04	0.0000	9.796E-03	0.0003
[illegible]	1.799E+01	0.4722	1.180E-02	0.0003	0.000E+00	0.0000	1.014E+01	0.2660	8.676E-02	0.0023	8.537E-01	0.0224	3.154E+01	0.8276
	1.181E+00	0.0310	8.893E-04	0.0000	0.000E+00	0.0000	6.655E-01	0.0175	1.622E-02	0.0004	2.900E-02	0.0008	2.306E+00	0.0605
U-238	2.253E-01	0.0059	1.452E-04	0.0000	0.000E+00	0.0000	1.269E-01	0.0033	1.085E-03	0.0000	1.069E-02	0.0003	4.175E-01	0.0110
Total	2.078E+01	0.5453	6.147E-02	0.0016	0.000E+00	0.0000	1.171E+01	0.3074	3.146E-01	0.0083	1.502E+00	0.0394	3.811E+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+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	1.903E-04	0.0000	1.401E-05	0.0000	0.000E+00	0.0000	3.707E-03	0.0001	5.268E-05	0.0000	4.847E-06	0.0000	5.594E-04	0.0000
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cm-243	1.340E-06	0.0000	1.905E-08	0.0000	0.000E+00	0.0000	5.047E-06	0.0000	1.123E-07	0.0000	4.202E-09	0.0000	7.637E-07	0.0000
Co-60	1.702E-18	0.0000	1.721E-25	0.0000	0.000E+00	0.0000	5.441E-20	0.0000	8.983E-21	0.0000	3.212E-21	0.0000	1.030E-22	0.0000
Cs-137	5.750E-06	0.0000	4.053E-13	0.0000	0.000E+00	0.0000	8.178E-07	0.0000	2.887E-07	0.0000	2.452E-07	0.0000	3.095E-09	0.0000
Eu-155	4.365E-21	0.0000	7.241E-27	0.0000	0.000E+00	0.0000	2.152E-23	0.0000	5.016E-24	0.0000	1.185E-25	0.0000	1.304E-24	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	1.548E-09	0.0000	1.476E-13	0.0000	0.000E+00	0.0000	1.509E-07	0.0000	1.984E-08	0.0000	8.052E-08	0.0000	1.140E-09	0.0000
Nb-94	1.550E-01	0.0052	4.997E-08	0.0000	0.000E+00	0.0000	2.771E-04	0.0000	2.719E-09	0.0000	4.712E-08	0.0000	4.198E-06	0.0000
Ni-59	0.000E+00	0.0000	2.344E-09	0.0000	0.000E+00	0.0000	2.931E-04	0.0000	1.517E-05	0.0000	2.009E-04	0.0000	8.881E-07	0.0000
Ni-63	0.000E+00	0.0000	8.562E-11	0.0000	0.000E+00	0.0000	1.263E-05	0.0000	6.535E-07	0.0000	8.656E-06	0.0000	3.826E-08	0.0000
Np-237	1.729E-02	0.0006	6.298E-05	0.0000	0.000E+00	0.0000	3.329E-01	0.0113	6.237E-03	0.0002	8.911E-05	0.0000	2.522E-03	0.0001
Pu-239	2.246E-06	0.0000	2.378E-05	0.0000	0.000E+00	0.0000	6.317E-03	0.0002	1.794E-04	0.0000	4.139E-06	0.0000	9.559E-04	0.0000
Pu-241	1.485E-04	0.0000	1.093E-05	0.0000	0.000E+00	0.0000	2.893E-03	0.0001	4.111E-05	0.0000	3.783E-06	0.0000	4.366E-04	0.0000
Sb-125	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	1.185E-11	0.0000	4.726E-15	0.0000	0.000E+00	0.0000	5.333E-09	0.0000	2.440E-10	0.0000	2.536E-10	0.0000	2.689E-12	0.0000
Tc-99	5.794E-10	0.0000	2.807E-13	0.0000	0.000E+00	0.0000	7.917E-06	0.0000	3.826E-09	0.0000	1.723E-07	0.0000	2.397E-10	0.0000
[illegible]	2.067E-02	0.0007	9.433E-03	0.0003	0.000E+00	0.0000	1.658E+00	0.0561	6.483E-02	0.0022	2.678E-01	0.0091	9.875E-02	0.0033
	2.588E-01	0.0088	3.743E-04	0.0000	0.000E+00	0.0000	9.958E-02	0.0034	8.117E-03	0.0003	8.913E-03	0.0003	4.374E-03	0.0001
U-238	1.907E-02	0.0006	1.105E-04	0.0000	0.000E+00	0.0000	2.026E-02	0.0007	8.025E-04	0.0000	3.345E-03	0.0001	1.227E-03	0.0000
Total	4.712E-01	0.0159	1.003E-02	0.0003	0.000E+00	0.0000	2.124E+00	0.0718	8.028E-02	0.0027	2.804E-01	0.0095	1.088E-01	0.0037

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.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	3.834E-02	0.0013	7.412E-05	0.0000	0.000E+00	0.0000	2.159E-02	0.0007	2.728E-05	0.0000	6.067E-06	0.0000	6.457E-02	0.0022
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cm-243	2.715E-05	0.0000	5.249E-08	0.0000	0.000E+00	0.0000	1.529E-05	0.0000	2.014E-08	0.0000	3.447E-09	0.0000	4.981E-05	0.0000
Co-60	1.822E-19	0.0000	3.523E-21	0.0000	0.000E+00	0.0000	1.044E-19	0.0000	5.175E-20	0.0000	2.887E-20	0.0000	2.139E-18	0.0000
Cs-137	1.399E-05	0.0000	1.803E-06	0.0000	0.000E+00	0.0000	7.948E-06	0.0000	5.967E-06	0.0000	8.869E-06	0.0000	4.568E-05	0.0000
Eu-155	9.939E-23	0.0000	3.202E-25	0.0000	0.000E+00	0.0000	5.600E-23	0.0000	2.815E-24	0.0000	1.572E-25	0.0000	4.552E-21	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	1.008E-05	0.0000	2.600E-08	0.0000	0.000E+00	0.0000	5.706E-06	0.0000	1.006E-06	0.0000	8.000E-06	0.0000	2.507E-05	0.0000
Nb-94	3.939E-04	0.0000	7.614E-06	0.0000	0.000E+00	0.0000	2.223E-04	0.0000	1.674E-09	0.0000	6.231E-08	0.0000	1.560E-01	0.0053
Ni-59	8.403E-04	0.0000	5.415E-06	0.0000	0.000E+00	0.0000	4.784E-04	0.0000	5.960E-05	0.0000	1.331E-03	0.0000	3.224E-03	0.0001
Ni-63	3.620E-05	0.0000	2.333E-07	0.0000	0.000E+00	0.0000	2.061E-05	0.0000	2.568E-06	0.0000	5.732E-05	0.0000	1.389E-04	0.0000
Np-237	2.988E-01	0.0101	5.774E-04	0.0000	0.000E+00	0.0000	1.690E-01	0.0057	4.232E-03	0.0001	1.223E-04	0.0000	8.318E-01	0.0281
Pu-239	1.795E-02	0.0006	3.469E-05	0.0000	0.000E+00	0.0000	1.011E-02	0.0003	2.542E-05	0.0000	1.419E-06	0.0000	3.560E-02	0.0012
Pu-241	3.134E-02	0.0011	6.059E-05	0.0000	0.000E+00	0.0000	1.765E-02	0.0006	2.229E-05	0.0000	4.959E-06	0.0000	5.262E-02	0.0018
Sb-125	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	2.186E-08	0.0000	8.460E-11	0.0000	0.000E+00	0.0000	1.313E-08	0.0000	2.507E-09	0.0000	3.484E-09	0.0000	4.692E-08	0.0000
Tc-99	1.341E-06	0.0000	1.729E-09	0.0000	0.000E+00	0.0000	1.581E-06	0.0000	2.080E-09	0.0000	1.141E-07	0.0000	1.113E-05	0.0000
[illegible]	1.419E+01	0.4797	1.102E-02	0.0004	0.000E+00	0.0000	7.992E+00	0.2703	6.924E-02	0.0023	6.719E-01	0.0227	2.505E+01	0.8471
	1.673E+00	0.0566	1.359E-03	0.0000	0.000E+00	0.0000	9.429E-01	0.0319	2.633E-02	0.0009	2.365E-02	0.0008	3.048E+00	0.1031
U-238	1.764E-01	0.0060	1.137E-04	0.0000	0.000E+00	0.0000	9.936E-02	0.0034	8.495E-04	0.0000	8.371E-03	0.0003	3.299E-01	0.0112
Total	1.642E+01	0.5554	1.326E-02	0.0004	0.000E+00	0.0000	9.254E+00	0.3129	1.008E-01	0.0034	7.054E-01	0.0239	2.957E+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-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	4.696E-05	0.0000	3.412E-06	0.0000	0.000E+00	0.0000	9.145E-04	0.0001	1.305E-05	0.0000	1.183E-06	0.0000	1.363E-04	0.0000
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cm-243	1.192E-09	0.0000	1.255E-08	0.0000	0.000E+00	0.0000	3.334E-06	0.0000	9.467E-08	0.0000	2.185E-09	0.0000	5.045E-07	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	2.733E-21	0.0000	1.927E-28	0.0000	0.000E+00	0.0000	3.888E-22	0.0000	1.372E-22	0.0000	1.165E-22	0.0000	1.471E-24	0.0000
Eu-155	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	9.596E-26	0.0000	9.149E-30	0.0000	0.000E+00	0.0000	9.354E-24	0.0000	1.230E-24	0.0000	4.991E-24	0.0000	7.070E-26	0.0000
Nb-94	1.018E-01	0.0072	3.279E-08	0.0000	0.000E+00	0.0000	1.819E-04	0.0000	1.785E-09	0.0000	3.092E-08	0.0000	2.755E-06	0.0000
Ni-59	0.000E+00	0.0000	4.242E-11	0.0000	0.000E+00	0.0000	5.305E-06	0.0000	2.745E-07	0.0000	3.636E-06	0.0000	1.607E-08	0.0000
Ni-63	0.000E+00	0.0000	9.953E-15	0.0000	0.000E+00	0.0000	1.468E-09	0.0000	7.597E-11	0.0000	1.006E-09	0.0000	4.448E-12	0.0000
Np-237	1.047E-02	0.0007	3.816E-05	0.0000	0.000E+00	0.0000	2.016E-01	0.0144	3.776E-03	0.0003	5.410E-05	0.0000	1.527E-03	0.0001
Pu-239	2.035E-06	0.0000	2.152E-05	0.0000	0.000E+00	0.0000	5.718E-03	0.0004	1.624E-04	0.0000	3.746E-06	0.0000	8.652E-04	0.0001
Pu-241	3.663E-05	0.0000	2.663E-06	0.0000	0.000E+00	0.0000	7.134E-04	0.0001	1.018E-05	0.0000	9.233E-07	0.0000	1.064E-04	0.0000
Sb-125	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Tc-99	3.077E-20	0.0000	1.491E-23	0.0000	0.000E+00	0.0000	4.205E-16	0.0000	2.032E-19	0.0000	9.152E-18	0.0000	1.273E-20	0.0000
[illegible]-1	8.948E-02	0.0064	5.264E-03	0.0004	0.000E+00	0.0000	1.110E+00	0.0791	3.943E-02	0.0028	1.517E-01	0.0108	5.681E-02	0.0040
[illegible]-2	1.418E-01	0.0101	2.300E-04	0.0000	0.000E+00	0.0000	7.077E-02	0.0050	6.520E-03	0.0005	4.875E-03	0.0003	2.804E-03	0.0002
U-238	1.037E-02	0.0007	6.024E-05	0.0000	0.000E+00	0.0000	1.105E-02	0.0008	4.375E-04	0.0000	1.823E-03	0.0001	6.689E-04	0.0000
Total	3.539E-01	0.0252	5.619E-03	0.0004	0.000E+00	0.0000	1.401E+00	0.0998	5.035E-02	0.0036	1.584E-01	0.0113	6.292E-02	0.0045

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-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	6.919E-03	0.0005	1.337E-05	0.0000	0.000E+00	0.0000	3.897E-03	0.0003	5.031E-06	0.0000	1.097E-06	0.0000	1.195E-02	0.0009
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cm-243	7.189E-06	0.0000	1.390E-08	0.0000	0.000E+00	0.0000	4.049E-06	0.0000	1.018E-08	0.0000	5.687E-10	0.0000	1.521E-05	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	4.922E-21	0.0000	6.346E-22	0.0000	0.000E+00	0.0000	2.797E-21	0.0000	2.100E-21	0.0000	3.121E-21	0.0000	1.695E-20	0.0000
Eu-155	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	4.625E-22	0.0000	1.193E-24	0.0000	0.000E+00	0.0000	2.619E-22	0.0000	4.619E-23	0.0000	3.672E-22	0.0000	1.155E-21	0.0000
Nb-94	1.914E-04	0.0000	3.700E-06	0.0000	0.000E+00	0.0000	1.080E-04	0.0000	8.133E-10	0.0000	3.028E-08	0.0000	1.022E-01	0.0073
Ni-59	1.126E-05	0.0000	7.255E-08	0.0000	0.000E+00	0.0000	6.410E-06	0.0000	7.985E-07	0.0000	1.783E-05	0.0000	4.560E-05	0.0000
Ni-63	3.116E-09	0.0000	2.008E-11	0.0000	0.000E+00	0.0000	1.774E-09	0.0000	2.210E-10	0.0000	4.934E-09	0.0000	1.262E-08	0.0000
Np-237	1.340E-01	0.0095	2.589E-04	0.0000	0.000E+00	0.0000	7.576E-02	0.0054	1.897E-03	0.0001	5.593E-05	0.0000	4.294E-01	0.0306
Pu-239	1.203E-02	0.0009	2.325E-05	0.0000	0.000E+00	0.0000	6.773E-03	0.0005	1.703E-05	0.0000	9.514E-07	0.0000	2.561E-02	0.0018
Pu-241	5.656E-03	0.0004	1.093E-05	0.0000	0.000E+00	0.0000	3.185E-03	0.0002	4.108E-06	0.0000	8.965E-07	0.0000	9.727E-03	0.0007
Sb-125	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Tc-99	5.273E-17	0.0000	6.800E-20	0.0000	0.000E+00	0.0000	6.217E-17	0.0000	8.181E-20	0.0000	4.487E-18	0.0000	5.494E-16	0.0000
[illegible]	6.198E+00	0.4414	1.225E-02	0.0009	0.000E+00	0.0000	3.493E+00	0.2488	3.377E-02	0.0024	2.879E-01	0.0205	1.148E+01	0.8174
[illegible]	1.017E+00	0.0725	8.510E-04	0.0001	0.000E+00	0.0000	5.732E-01	0.0408	1.684E-02	0.0012	9.963E-03	0.0007	1.845E+00	0.1314
U-238	7.120E-02	0.0051	4.598E-05	0.0000	0.000E+00	0.0000	4.011E-02	0.0029	3.429E-04	0.0000	3.379E-03	0.0002	1.395E-01	0.0099
Total	7.445E+00	0.5302	1.346E-02	0.0010	0.000E+00	0.0000	4.196E+00	0.2988	5.288E-02	0.0038	3.013E-01	0.0215	1.404E+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)	Branch Fraction*	DSR(j,t) (mrem/yr)/(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
Am-241	Am-241	1.000E+00	6.524E+00	6.509E+00	6.479E+00	6.374E+00	6.083E+00	5.165E+00	3.227E+00	5.960E-01
Am-241	Np-237	1.000E+00	7.587E-06	1.465E-05	2.874E-05	7.737E-05	2.105E-04	6.140E-04	1.343E-03	1.557E-03
Am-241	U-233	1.000E+00	8.738E-12	2.107E-11	6.466E-11	4.106E-10	2.941E-09	2.579E-08	1.405E-07	3.040E-07
Am-241	Th-229	1.000E+00	2.372E-11	2.373E-11	2.376E-11	2.387E-11	2.478E-11	4.785E-11	4.566E-10	5.811E-09
Am-241	ΣDSR(j)		6.524E+00	6.509E+00	6.479E+00	6.374E+00	6.084E+00	5.166E+00	3.229E+00	5.975E-01
C-14	C-14	1.000E+00	1.471E+00	1.689E-01	1.984E-03	3.318E-10	9.621E-30	0.000E+00	0.000E+00	0.000E+00
Cm-243	Cm-243	9.976E-01	5.115E+00	4.988E+00	4.744E+00	3.980E+00	2.410E+00	4.162E-01	2.747E-03	6.170E-11
Cm-243	Pu-239	9.976E-01	8.456E-05	1.412E-04	2.497E-04	5.888E-04	1.280E-03	2.116E-03	2.115E-03	1.521E-03
Cm-243	U-235	9.976E-01	3.224E-14	9.602E-14	3.327E-13	2.209E-12	1.456E-11	9.419E-11	3.316E-10	7.154E-10
Cm-243	Pa-231	9.976E-01	2.628E-14	2.597E-14	2.627E-14	4.641E-14	4.584E-13	9.470E-12	9.220E-11	3.885E-10
Cm-243	Ac-227	9.976E-01	3.519E-14	3.454E-14	3.342E-14	3.600E-14	3.062E-13	1.345E-11	1.909E-10	8.951E-10
Cm-243	ΣDSR(j)		5.115E+00	4.989E+00	4.745E+00	3.981E+00	2.411E+00	4.183E-01	4.863E-03	1.521E-03
Cm-243	Cm-243	2.400E-03	1.231E-02	1.200E-02	1.141E-02	9.576E-03	5.798E-03	1.001E-03	6.609E-06	1.484E-13
Cm-243	Am-243	2.400E-03	4.368E-05	7.276E-05	1.280E-04	2.926E-04	5.738E-04	6.033E-04	1.113E-04	1.325E-07
Cm-243	Pu-239	2.400E-03	8.444E-11	1.579E-10	3.339E-10	1.243E-09	5.576E-09	2.495E-08	4.754E-08	3.791E-08
Cm-243	U-235	2.400E-03	9.295E-19	1.182E-18	1.728E-18	4.911E-18	3.932E-17	6.739E-16	5.235E-15	1.630E-14
Cm-243	Pa-231	2.400E-03	1.425E-16	1.794E-16	2.496E-16	4.596E-16	8.119E-16	9.069E-16	1.343E-15	8.446E-15
Cm-243	Ac-227	2.400E-03	1.909E-16	2.403E-16	3.341E-16	6.149E-16	1.085E-15	1.209E-15	2.551E-15	1.935E-14
	ΣDSR(j)		1.235E-02	1.207E-02	1.154E-02	9.868E-03	6.372E-03	1.605E-03	1.179E-04	1.704E-07
Co-60	Co-60	1.000E+00	7.479E+00	6.487E+00	4.881E+00	1.803E+00	1.046E-01	4.961E-06	2.183E-18	0.000E+00
Cs-137	Cs-137	1.000E+00	1.109E+01	1.054E+01	9.527E+00	6.681E+00	2.424E+00	6.973E-02	2.748E-06	1.020E-21
Eu-155	Eu-155	1.000E+00	7.051E-02	6.128E-02	4.630E-02	1.735E-02	1.050E-03	5.734E-08	3.793E-20	0.000E+00
H-3	H-3	1.000E+00	7.005E-02	1.634E-02	8.749E-04	3.060E-06	4.984E-21	0.000E+00	0.000E+00	0.000E+00
I-129	I-129	1.000E+00	9.239E+01	8.759E+01	7.868E+01	5.405E+01	1.848E+01	4.323E-01	9.425E-06	4.341E-22
Nb-94	Nb-94	1.000E+00	3.738E+00	3.736E+00	3.731E+00	3.715E+00	3.671E+00	3.519E+00	3.119E+00	2.045E+00
Ni-59	Ni-59	1.000E+00	1.171E-02	1.164E-02	1.150E-02	1.103E-02	9.779E-03	6.415E-03	1.919E-03	2.714E-05
Ni-63	Ni-63	1.000E+00	3.207E-02	3.165E-02	3.082E-02	2.810E-02	2.156E-02	8.540E-03	6.040E-04	5.487E-08
Np-237	Np-237	1.000E+00	2.193E+01	2.190E+01	2.186E+01	2.173E+01	2.133E+01	2.000E+01	1.663E+01	8.585E+00
Np-237	U-233	1.000E+00	2.836E-05	4.797E-05	8.692E-05	2.202E-04	5.756E-04	1.561E-03	2.870E-03	2.082E-03
Np-237	Th-229	1.000E+00	2.042E-07	2.060E-07	2.109E-07	2.421E-07	4.457E-07	2.321E-06	1.402E-05	6.661E-05
Np-237	ΣDSR(j)		2.193E+01	2.191E+01	2.187E+01	2.173E+01	2.133E+01	2.001E+01	1.664E+01	8.588E+00

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

Parent (i)	Product (j)	Branch Fraction*	DSR(j,t) (mrem/yr)/(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
Pu-239	Pu-239	1.000E+00	2.021E+00	2.020E+00	2.018E+00	2.012E+00	1.996E+00	1.938E+00	1.780E+00	1.281E+00
Pu-239	U-235	1.000E+00	1.568E-09	2.890E-09	5.533E-09	1.472E-08	4.044E-08	1.245E-07	3.191E-07	6.216E-07
Pu-239	Pa-231	1.000E+00	9.303E-12	1.619E-11	4.086E-11	2.393E-10	1.715E-09	1.568E-08	9.689E-08	3.404E-07
Pu-239	Ac-227	1.000E+00	7.561E-12	8.244E-12	1.253E-11	6.788E-11	1.354E-09	2.457E-08	2.046E-07	7.842E-07
Pu-239	∑DSR(j)		2.021E+00	2.020E+00	2.018E+00	2.012E+00	1.996E+00	1.938E+00	1.780E+00	1.281E+00
Pu-241	Pu-241	1.000E+00	3.818E-02	3.637E-02	3.301E-02	2.350E-02	8.906E-03	2.982E-04	1.616E-08	3.101E-23
Pu-241	Am-241	1.000E+00	1.477E-02	2.471E-02	4.315E-02	9.455E-02	1.688E-01	1.854E-01	1.169E-01	2.156E-02
Pu-241	Np-237	1.000E+00	8.501E-09	2.615E-08	9.254E-08	6.002E-07	3.507E-06	1.707E-05	4.380E-05	5.319E-05
Pu-241	U-233	1.000E+00	3.088E-14	5.313E-14	1.798E-13	2.346E-12	3.736E-11	6.219E-10	4.422E-09	1.052E-08
Pu-241	Th-229	1.000E+00	2.665E-13	2.927E-13	3.416E-13	4.805E-13	7.020E-13	1.308E-12	1.299E-11	1.867E-10
Pu-241	∑DSR(j)		5.295E-02	6.108E-02	7.616E-02	1.181E-01	1.777E-01	1.857E-01	1.169E-01	2.162E-02
Pu-241	Pu-241	2.450E-05	9.354E-07	8.911E-07	8.087E-07	5.758E-07	2.182E-07	7.307E-09	4.448E-13	7.597E-28
Pu-241	Np-237	2.450E-05	1.846E-10	3.501E-10	6.583E-10	1.525E-09	2.826E-09	3.407E-09	2.854E-09	1.468E-09
Pu-241	U-233	2.450E-05	1.734E-16	4.754E-16	1.506E-15	8.854E-15	4.901E-14	2.218E-13	4.789E-13	3.628E-13
Pu-241	Th-229	2.450E-05	7.513E-18	8.821E-18	1.131E-17	1.916E-17	4.356E-17	2.767E-16	2.072E-15	1.075E-14
Pu-241	∑DSR(j)		9.356E-07	8.914E-07	8.093E-07	5.773E-07	2.210E-07	1.071E-08	2.855E-09	1.468E-09
Sb-125	Sb-125	1.000E+00	7.713E+00	2.979E+00	4.429E-01	5.613E-04	2.963E-12	3.165E-41	0.000E+00	0.000E+00
Sr-90	Sr-90	1.000E+00	3.980E+01	3.700E+01	3.196E+01	1.915E+01	4.433E+00	2.645E-02	1.164E-08	6.343E-31
Tc-99	Tc-99	1.000E+00	9.682E-01	9.361E-01	8.747E-01	6.900E-01	3.503E-01	3.265E-02	3.712E-05	1.831E-15
U-234	U-234	1.000E+00	1.113E+00	1.112E+00	1.109E+00	1.100E+00	1.074E+00	9.885E-01	7.774E-01	3.216E-01
U-234	Th-230	1.000E+00	1.427E-06	2.074E-06	3.305E-06	7.593E-06	1.969E-05	6.025E-05	1.622E-04	3.963E-04
U-234	Ra-226	1.000E+00	1.430E-07	2.925E-07	8.765E-07	5.866E-06	4.428E-05	4.213E-04	2.799E-03	1.236E-02
U-234	Pb-210	1.000E+00	4.006E-07	4.147E-07	5.033E-07	2.113E-06	3.040E-05	5.991E-04	5.587E-03	2.578E-02
U-234	∑DSR(j)		1.113E+00	1.112E+00	1.109E+00	1.100E+00	1.074E+00	9.896E-01	7.860E-01	3.601E-01
U-235	U-235	1.000E+00	1.347E+00	1.346E+00	1.343E+00	1.332E+00	1.303E+00	1.205E+00	9.629E-01	4.287E-01
U-235	Pa-231	1.000E+00	5.166E-03	8.863E-03	1.621E-02	4.135E-02	1.082E-01	2.924E-01	5.292E-01	3.589E-01
U-235	Ac-227	1.000E+00	4.020E-04	1.095E-03	3.460E-03	2.053E-02	1.173E-01	5.618E-01	1.229E+00	8.598E-01
U-235	∑DSR(j)		1.353E+00	1.355E+00	1.362E+00	1.394E+00	1.528E+00	2.059E+00	2.721E+00	1.647E+00
U-238	U-238	1.000E+00	1.117E+00	1.115E+00	1.113E+00	1.104E+00	1.078E+00	9.937E-01	7.849E-01	3.312E-01
U-238	U-234	1.000E+00	4.490E-06	7.659E-06	1.391E-05	3.562E-05	9.569E-05	2.843E-04	6.646E-04	9.142E-04
U-238	Th-230	1.000E+00	2.229E-08	2.227E-08	2.223E-08	2.215E-08	2.240E-08	2.836E-08	8.195E-08	4.895E-07
U-238	Ra-226	1.000E+00	5.871E-08	5.861E-08	5.849E-08	5.804E-08	5.794E-08	9.245E-08	8.584E-07	1.228E-05
U-238	Pb-210	1.000E+00	3.090E-07	3.087E-07	3.079E-07	3.054E-07	2.987E-07	3.214E-07	1.710E-06	2.474E-05
U-238	∑DSR(j)		1.117E+00	1.115E+00	1.113E+00	1.104E+00	1.078E+00	9.940E-01	7.855E-01	3.321E-01

*Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
The DSR includes contributions from associated (half-life ≤ 0.5 yr) 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
Am-241	3.832E+00	3.841E+00	3.859E+00	3.922E+00	4.109E+00	4.840E+00	7.743E+00	4.184E+01
C-14	1.700E+01	1.480E+02	1.260E+04	7.535E+10	*4.454E+12	*4.454E+12	*4.454E+12	*4.454E+12
Cm-243	4.876E+00	4.999E+00	5.256E+00	6.264E+00	1.034E+01	5.954E+01	5.020E+03	1.644E+04
Co-60	3.343E+00	3.854E+00	5.122E+00	1.386E+01	2.385E+02	5.039E+06	*1.131E+15	*1.131E+15
Cs-137	2.254E+00	2.371E+00	2.624E+00	3.742E+00	1.031E+01	3.585E+02	9.096E+06	*8.701E+13
Eu-155	3.546E+02	4.079E+02	5.400E+02	1.441E+03	2.380E+04	4.360E+08	*4.651E+14	*4.651E+14
H-3	3.569E+02	1.530E+03	2.858E+04	8.171E+08	*9.594E+15	*9.594E+15	*9.594E+15	*9.594E+15
I-129	2.706E-01	2.654E-01	3.178E-01	4.626E-01	1.353E+00	5.783E+01	2.653E+06	*1.766E+08
Nb-94	6.688E+00	6.692E+00	6.701E+00	6.729E+00	6.811E+00	7.104E+00	8.015E+00	1.223E+01
Ni-59	2.134E+03	2.147E+03	2.173E+03	2.267E+03	2.556E+03	3.897E+03	1.303E+04	9.211E+05
Ni-63	7.796E+02	7.899E+02	8.111E+02	8.898E+02	1.159E+03	2.928E+03	4.139E+04	4.556E+08
Np-237	1.140E+00	1.141E+00	1.143E+00	1.151E+00	1.172E+00	1.250E+00	1.503E+00	2.911E+00
Pu-239	1.237E+01	1.238E+01	1.239E+01	1.242E+01	1.253E+01	1.290E+01	1.405E+01	1.952E+01
Pu-241	4.722E+02	4.093E+02	3.283E+02	2.118E+02	1.407E+02	1.346E+02	2.138E+02	1.157E+03
Sb-125	3.241E+00	8.392E+00	5.644E+01	4.454E+04	8.438E+12	*1.033E+15	*1.033E+15	*1.033E+15
Sr-90	6.282E-01	6.757E-01	7.822E-01	1.305E+00	5.639E+00	9.453E+02	2.147E+09	*1.365E+14
Tc-99	2.582E+01	2.671E+01	2.858E+01	3.623E+01	7.137E+01	7.656E+02	6.736E+05	*1.696E+10
U-234	2.246E+01	2.249E+01	2.254E+01	2.273E+01	2.327E+01	2.526E+01	3.181E+01	6.942E+01
U-235	1.848E+01	1.844E+01	1.835E+01	1.793E+01	1.636E+01	1.214E+01	9.187E+00	1.517E+01
U-238	2.239E+01	2.241E+01	2.247E+01	2.265E+01	2.318E+01	2.515E+01	3.183E+01	7.527E+01

*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)
Am-241	2.000E-02	0.000E+00	6.524E+00	3.832E+00	6.524E+00	3.832E+00
C-14	2.600E-01	0.000E+00	1.471E+00	1.700E+01	1.471E+00	1.700E+01
Cm-243	1.000E-02	0.000E+00	5.128E+00	4.876E+00	5.128E+00	4.876E+00
Co-60	9.600E-01	0.000E+00	7.479E+00	3.343E+00	7.479E+00	3.343E+00
Cs-137	1.662E+01	0.000E+00	1.109E+01	2.254E+00	1.109E+01	2.254E+00
Eu-155	1.200E-01	0.000E+00	7.051E-02	3.546E+02	7.051E-02	3.546E+02
H-3	3.887E+01	0.000E+00	7.005E-02	3.569E+02	7.005E-02	3.569E+02
I-129	2.660E+00	0.000E+00	9.239E+01	2.706E-01	9.239E+01	2.706E-01
Nb-94	5.000E-02	0.000E+00	3.738E+00	6.688E+00	3.738E+00	6.688E+00
Ni-59	1.680E+00	0.000E+00	1.171E-02	2.134E+03	1.171E-02	2.134E+03
Ni-63	2.300E-01	0.000E+00	3.207E-02	7.796E+02	3.207E-02	7.796E+02
Np-237	5.000E-02	0.000E+00	2.193E+01	1.140E+00	2.193E+01	1.140E+00
Pu-239	2.000E-02	0.000E+00	2.021E+00	1.237E+01	2.021E+00	1.237E+01
Pu-241	4.500E-01	60.1 ± 0.1	1.955E-01	1.279E+02	5.295E-02	4.722E+02
Sb-125	2.300E-01	0.000E+00	7.713E+00	3.241E+00	7.713E+00	3.241E+00
Sr-90	4.030E+00	0.000E+00	3.980E+01	6.282E-01	3.980E+01	6.282E-01
Tc-99	3.000E-01	0.000E+00	9.682E-01	2.582E+01	9.682E-01	2.582E+01
[illegible]4	3.187E+01	0.000E+00	1.113E+00	2.246E+01	1.113E+00	2.246E+01
[illegible]5	1.120E+00	351.4 ± 0.7	2.741E+00	9.120E+00	1.353E+00	1.848E+01
U-238	4.200E-01	0.000E+00	1.117E+00	2.239E+01	1.117E+00	2.239E+01

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

Nuclide (j)	Parent (i)	BRF(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
Am-241	Am-241	1.000E+00	1.305E-01	1.302E-01	1.296E-01	1.275E-01	1.217E-01	1.033E-01	6.455E-02	1.192E-02
Am-241	Pu-241	1.000E+00	6.646E-03	1.112E-02	1.942E-02	4.255E-02	7.594E-02	8.342E-02	5.260E-02	9.703E-03
Am-241	∑DOSE(j)		1.371E-01	1.413E-01	1.490E-01	1.700E-01	1.976E-01	1.867E-01	1.171E-01	2.162E-02
Np-237	Am-241	1.000E+00	1.517E-07	2.930E-07	5.748E-07	1.547E-06	4.210E-06	1.228E-05	2.686E-05	3.114E-05
Np-237	Np-237	1.000E+00	1.096E+00	1.095E+00	1.093E+00	1.086E+00	1.067E+00	1.000E+00	8.317E-01	4.293E-01
Np-237	Pu-241	1.000E+00	3.826E-09	1.177E-08	4.164E-08	2.701E-07	1.578E-06	7.681E-06	1.971E-05	2.394E-05
Np-237	Pu-241	2.450E-05	8.305E-11	1.575E-10	2.962E-10	6.863E-10	1.272E-09	1.533E-09	1.284E-09	6.605E-10
Np-237	∑DOSE(j)		1.096E+00	1.095E+00	1.093E+00	1.086E+00	1.067E+00	1.000E+00	8.317E-01	4.293E-01
U-233	Am-241	1.000E+00	1.748E-13	4.214E-13	1.293E-12	8.213E-12	5.882E-11	5.157E-10	2.810E-09	6.081E-09
U-233	Np-237	1.000E+00	1.418E-06	2.398E-06	4.346E-06	1.101E-05	2.878E-05	7.805E-05	1.435E-04	1.041E-04
U-233	Pu-241	1.000E+00	1.390E-14	2.391E-14	8.091E-14	1.056E-12	1.681E-11	2.799E-10	1.990E-09	4.733E-09
U-233	Pu-241	2.450E-05	7.802E-17	2.139E-16	6.777E-16	3.984E-15	2.206E-14	9.963E-14	2.155E-13	1.633E-13
U-233	∑DOSE(j)		1.418E-06	2.398E-06	4.346E-06	1.101E-05	2.878E-05	7.806E-05	1.435E-04	1.041E-04
Th-229	Am-241	1.000E+00	4.744E-13	4.746E-13	4.751E-13	4.775E-13	4.956E-13	9.570E-13	9.133E-12	1.162E-10
Th-229	Np-237	1.000E+00	1.021E-08	1.030E-08	1.055E-08	1.211E-08	2.229E-08	1.161E-07	7.012E-07	3.330E-06
Th-229	Pu-241	1.000E+00	1.199E-13	1.317E-13	1.537E-13	2.162E-13	3.159E-13	5.888E-13	5.846E-12	8.403E-11
Th-229	Pu-241	2.450E-05	3.381E-18	3.969E-18	5.088E-18	8.622E-18	1.960E-17	1.245E-16	9.325E-16	4.837E-15
Th-229	∑DOSE(j)		1.021E-08	1.030E-08	1.055E-08	1.211E-08	2.229E-08	1.161E-07	7.012E-07	3.331E-06
C-14	C-14	1.000E+00	3.824E-01	4.393E-02	5.159E-04	8.627E-11	2.477E-30	0.000E+00	0.000E+00	0.000E+00
Cm-243	Cm-243	9.976E-01	5.115E-02	4.988E-02	4.744E-02	3.980E-02	2.410E-02	4.162E-03	2.747E-05	6.170E-13
Cm-243	Cm-243	2.400E-03	1.231E-04	1.200E-04	1.141E-04	9.576E-05	5.798E-05	1.001E-05	6.609E-08	1.484E-15
Cm-243	∑DOSE(j)		5.127E-02	5.000E-02	4.756E-02	3.990E-02	2.416E-02	4.172E-03	2.754E-05	6.185E-13
Pu-239	Cm-243	9.976E-01	8.456E-07	1.412E-06	2.497E-06	5.888E-06	1.280E-05	2.116E-05	2.115E-05	1.521E-05
Pu-239	Cm-243	2.400E-03	8.444E-13	1.579E-12	3.339E-12	1.243E-11	5.576E-11	2.495E-10	4.754E-10	3.791E-10
Pu-239	Pu-239	1.000E+00	4.041E-02	4.040E-02	4.036E-02	4.025E-02	3.992E-02	3.877E-02	3.560E-02	2.561E-02
Pu-239	∑DOSE(j)		4.041E-02	4.040E-02	4.036E-02	4.025E-02	3.993E-02	3.879E-02	3.562E-02	2.563E-02
U-235	Cm-243	9.976E-01	3.224E-16	9.602E-16	3.327E-15	2.209E-14	1.456E-13	9.419E-13	3.316E-12	7.154E-12
U-235	Cm-243	2.400E-03	9.295E-21	1.182E-20	1.728E-20	4.911E-20	3.932E-19	6.739E-18	5.235E-17	1.630E-16
U-235	Pu-239	1.000E+00	3.135E-11	5.780E-11	1.107E-10	2.944E-10	8.088E-10	2.491E-09	6.382E-09	1.243E-08
U-235	U-235	1.000E+00	1.509E+00	1.507E+00	1.504E+00	1.492E+00	1.459E+00	1.350E+00	1.078E+00	4.802E-01
U-235	∑DOSE(j)		1.509E+00	1.507E+00	1.504E+00	1.492E+00	1.459E+00	1.350E+00	1.078E+00	4.802E-01
Pa-231	Cm-243	9.976E-01	2.628E-16	2.597E-16	2.627E-16	4.641E-16	4.584E-15	9.470E-14	9.220E-13	3.885E-12
Pa-231	Cm-243	2.400E-03	1.425E-18	1.794E-18	2.496E-18	4.596E-18	8.119E-18	9.069E-18	1.343E-17	8.446E-17
Pa-231	Pu-239	1.000E+00	1.861E-13	3.237E-13	8.172E-13	4.786E-12	3.430E-11	3.136E-10	1.938E-09	6.808E-09
Pa-231	U-235	1.000E+00	5.786E-03	9.926E-03	1.816E-02	4.631E-02	1.212E-01	3.275E-01	5.927E-01	4.020E-01
Pa-231	∑DOSE(j)		5.786E-03	9.926E-03	1.816E-02	4.631E-02	1.212E-01	3.275E-01	5.927E-01	4.020E-01
Ac-227	Cm-243	9.976E-01	3.519E-16	3.454E-16	3.342E-16	3.600E-16	3.062E-15	1.345E-13	1.909E-12	8.951E-12
Ac-227	Cm-243	2.400E-03	1.909E-18	2.403E-18	3.341E-18	6.149E-18	1.085E-17	1.209E-17	2.551E-17	1.935E-16
Ac-227	Pu-239	1.000E+00	1.512E-13	1.649E-13	2.506E-13	1.758E-12	2.708E-11	4.913E-10	4.093E-09	1.568E-08
Ac-227	U-235	1.000E+00	4.503E-04	1.227E-03	3.875E-03	2.299E-02	1.314E-01	6.292E-01	1.377E+00	9.630E-01
Ac-227	∑DOSE(j)		4.503E-04	1.227E-03	3.875E-03	2.299E-02	1.314E-01	6.292E-01	1.377E+00	9.630E-01

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

Nuclide (j)	Parent (i)	BRF(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
Am-243	Cm-243	2.400E-03	4.368E-07	7.276E-07	1.280E-06	2.926E-06	5.738E-06	6.033E-06	1.113E-06	1.325E-09
Co-60	Co-60	1.000E+00	7.329E+00	6.358E+00	4.783E+00	1.767E+00	1.027E-01	4.862E-06	2.139E-18	0.000E+00
Cs-137	Cs-137	1.000E+00	1.843E+02	1.752E+02	1.583E+02	1.110E+02	4.029E+01	1.159E+00	4.568E-05	1.695E-20
Eu-155	Eu-155	1.000E+00	8.461E-03	7.354E-03	5.555E-03	2.082E-03	1.260E-04	6.881E-09	4.552E-21	0.000E+00
H-3	H-3	1.000E+00	2.723E+00	6.352E-01	3.401E-02	1.189E-06	1.937E-19	0.000E+00	0.000E+00	0.000E+00
I-129	I-129	1.000E+00	2.458E+02	2.330E+02	2.093E+02	1.438E+02	4.917E+01	1.150E+00	2.507E-05	1.155E-21
Nb-94	Nb-94	1.000E+00	1.869E-01	1.868E-01	1.866E-01	1.858E-01	1.835E-01	1.760E-01	1.560E-01	1.022E-01
Ni-59	Ni-59	1.000E+00	1.968E-02	1.956E-02	1.933E-02	1.853E-02	1.643E-02	1.078E-02	3.224E-03	4.560E-05
Ni-63	Ni-63	1.000E+00	7.376E-03	7.279E-03	7.089E-03	6.462E-03	4.960E-03	1.964E-03	1.389E-04	1.262E-08
Pu-241	Pu-241	1.000E+00	1.718E-02	1.637E-02	1.485E-02	1.058E-02	4.008E-03	1.342E-04	8.170E-09	1.395E-23
41	Pu-241	2.450E-05	4.209E-07	4.010E-07	3.639E-07	2.591E-07	9.819E-08	3.288E-09	2.002E-13	3.409E-28
41	∑DOSE(j)		1.718E-02	1.637E-02	1.485E-02	1.058E-02	4.008E-03	1.342E-04	8.171E-09	1.395E-23
Sb-125	Sb-125	1.000E+00	1.774E+00	6.852E-01	1.019E-01	1.291E-04	6.815E-13	0.000E+00	0.000E+00	0.000E+00
Sr-90	Sr-90	1.000E+00	1.604E+02	1.491E+02	1.288E+02	7.718E+01	1.787E+01	1.066E-01	4.692E-08	0.000E+00
Tc-99	Tc-99	1.000E+00	2.905E-01	2.808E-01	2.624E-01	2.070E-01	1.051E-01	9.796E-03	1.113E-05	5.494E-16
U-234	U-234	1.000E+00	3.547E+01	3.543E+01	3.534E+01	3.505E+01	3.423E+01	3.150E+01	2.478E+01	1.025E+01
U-234	U-238	1.000E+00	1.886E-06	3.208E-06	5.842E-06	1.496E-05	4.019E-05	1.194E-04	2.791E-04	3.840E-04
U-234	∑DOSE(j)		3.547E+01	3.543E+01	3.534E+01	3.505E+01	3.423E+01	3.150E+01	2.478E+01	1.025E+01
Th-230	U-234	1.000E+00	4.549E-05	6.610E-05	1.053E-04	2.420E-04	6.275E-04	1.920E-03	5.170E-03	1.263E-02
Th-230	U-238	1.000E+00	9.363E-09	9.354E-09	9.338E-09	9.305E-09	9.406E-09	1.191E-08	3.442E-08	2.056E-07
Th-230	∑DOSE(j)		4.550E-05	6.611E-05	1.053E-04	2.420E-04	6.275E-04	1.920E-03	5.170E-03	1.263E-02
Ra-226	U-234	1.000E+00	4.558E-06	9.322E-06	2.793E-05	1.870E-04	1.411E-03	1.343E-02	8.919E-02	3.940E-01
Ra-226	U-238	1.000E+00	2.466E-08	2.462E-08	2.457E-08	2.438E-08	2.433E-08	3.883E-08	3.605E-07	5.117E-06
Ra-226	∑DOSE(j)		4.583E-06	9.347E-06	2.796E-05	1.870E-04	1.411E-03	1.343E-02	8.919E-02	3.940E-01
Pb-210	U-234	1.000E+00	1.277E-05	1.322E-05	1.604E-05	6.735E-05	9.689E-04	1.909E-02	1.781E-01	8.217E-01
Pb-210	U-238	1.000E+00	1.298E-07	1.297E-07	1.293E-07	1.282E-07	1.255E-07	1.350E-07	7.183E-07	2.039E-05
Pb-210	∑DOSE(j)		1.290E-05	1.335E-05	1.617E-05	6.748E-05	9.690E-04	1.909E-02	1.781E-01	8.217E-01
U-238	U-238	1.000E+00	4.690E-01	4.685E-01	4.674E-01	4.636E-01	4.529E-01	4.174E-01	3.296E-01	1.391E-01

BRF(i) is the branch fraction of the parent nuclide.

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	BRF(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
Am-241	Am-241	1.000E+00	2.000E-02	1.996E-02	1.988E-02	1.960E-02	1.882E-02	1.634E-02	1.092E-02	2.657E-03
Am-241	Pu-241	1.000E+00	0.000E+00	7.038E-04	2.009E-03	5.663E-03	1.102E-02	1.263E-02	8.520E-03	2.074E-03
Am-241	∑S(j):		2.000E-02	2.066E-02	2.189E-02	2.526E-02	2.985E-02	2.896E-02	1.944E-02	4.732E-03
Np-237	Am-241	1.000E+00	0.000E+00	6.469E-09	1.935E-08	6.390E-08	1.865E-07	5.654E-07	1.298E-06	1.769E-06
Np-237	Np-237	1.000E+00	5.000E-02	4.996E-02	4.989E-02	4.964E-02	4.894E-02	4.654E-02	4.033E-02	2.442E-02
Np-237	Pu-241	1.000E+00	0.000E+00	1.149E-10	1.000E-09	9.920E-09	6.650E-08	3.431E-07	9.270E-07	1.329E-06
Np-237	Pu-241	2.450E-05	0.000E+00	3.485E-12	9.963E-12	2.822E-11	5.586E-11	6.933E-11	6.059E-11	3.669E-11
Np-237	∑S(j):		5.000E-02	4.996E-02	4.989E-02	4.964E-02	4.894E-02	4.654E-02	4.033E-02	2.442E-02
U-233	Am-241	1.000E+00	0.000E+00	1.413E-14	1.267E-13	1.387E-12	1.196E-11	1.146E-10	6.824E-10	1.993E-09
U-233	Np-237	1.000E+00	0.000E+00	2.182E-07	6.517E-07	2.139E-06	6.143E-06	1.762E-05	3.506E-05	3.420E-05
U-233	Pu-241	1.000E+00	0.000E+00	1.681E-16	4.417E-15	1.492E-13	3.156E-12	5.911E-11	4.615E-10	1.483E-09
U-233	Pu-241	2.450E-05	0.000E+00	7.673E-18	6.671E-17	6.590E-16	4.363E-15	2.143E-14	5.023E-14	5.120E-14
U-233	∑S(j):		0.000E+00	2.182E-07	6.517E-07	2.139E-06	6.143E-06	1.762E-05	3.506E-05	3.420E-05
Th-229	Am-241	1.000E+00	0.000E+00	4.452E-19	1.198E-17	4.387E-16	1.147E-14	3.796E-13	7.512E-12	1.043E-10
Th-229	Np-237	1.000E+00	0.000E+00	1.031E-11	9.250E-11	1.017E-09	8.886E-09	8.916E-08	6.088E-07	2.998E-06
Th-229	Pu-241	1.000E+00	0.000E+00	3.979E-21	3.154E-19	3.615E-17	2.403E-15	1.686E-13	4.724E-12	7.524E-11
Th-229	Pu-241	2.450E-05	0.000E+00	2.426E-22	6.381E-21	2.163E-19	4.624E-18	9.022E-17	8.045E-16	4.347E-15
Th-229	∑S(j):		0.000E+00	1.031E-11	9.250E-11	1.017E-09	8.886E-09	8.916E-08	6.088E-07	2.999E-06
C-14	C-14	1.000E+00	2.600E-01	2.824E-02	3.317E-04	5.562E-11	1.625E-30	0.000E+00	0.000E+00	0.000E+00
Cm-243	Cm-243	9.976E-01	9.976E-03	9.732E-03	9.261E-03	7.786E-03	4.743E-03	8.369E-04	5.890E-06	1.723E-13
Cm-243	Cm-243	2.400E-03	2.400E-05	2.341E-05	2.228E-05	1.873E-05	1.141E-05	2.013E-06	1.417E-08	4.144E-16
Cm-243	∑S(j):		1.000E-02	9.755E-03	9.283E-03	7.805E-03	4.755E-03	8.389E-04	5.904E-06	1.727E-13
Pu-239	Cm-243	9.976E-01	0.000E+00	2.838E-07	8.306E-07	2.543E-06	6.067E-06	1.052E-05	1.117E-05	1.011E-05
Pu-239	Cm-243	2.400E-03	0.000E+00	3.210E-14	3.824E-13	2.901E-12	2.101E-11	1.176E-10	2.496E-10	2.521E-10
Pu-239	Pu-239	1.000E+00	2.000E-02	2.000E-02	1.999E-02	1.997E-02	1.991E-02	1.972E-02	1.916E-02	1.735E-02
Pu-239	∑S(j):		2.000E-02	2.000E-02	1.999E-02	1.997E-02	1.992E-02	1.973E-02	1.917E-02	1.736E-02
U-235	Cm-243	9.976E-01	0.000E+00	1.403E-16	1.241E-15	1.300E-14	9.980E-14	6.921E-13	2.596E-12	6.876E-12
U-235	Cm-243	2.400E-03	0.000E+00	1.056E-23	2.803E-22	9.774E-21	2.232E-19	4.861E-18	4.089E-17	1.566E-16
U-235	Pu-239	1.000E+00	0.000E+00	1.969E-11	5.900E-11	1.960E-10	5.820E-10	1.873E-09	5.087E-09	1.214E-08
U-235	U-235	1.000E+00	1.120E+00	1.119E+00	1.117E+00	1.110E+00	1.091E+00	1.027E+00	8.628E-01	4.693E-01
U-235	∑S(j):		1.120E+00	1.119E+00	1.117E+00	1.110E+00	1.091E+00	1.027E+00	8.628E-01	4.693E-01
Pa-231	Cm-243	9.976E-01	0.000E+00	9.906E-22	2.636E-20	9.280E-19	2.179E-17	5.227E-16	5.581E-15	3.121E-14
Pa-231	Cm-243	2.400E-03	0.000E+00	5.594E-29	4.462E-27	5.221E-25	3.642E-23	2.768E-21	7.184E-20	6.782E-19
Pa-231	Pu-239	1.000E+00	0.000E+00	2.081E-16	1.867E-15	2.051E-14	1.790E-13	1.786E-12	1.202E-11	5.593E-11
Pa-231	U-235	1.000E+00	0.000E+00	2.364E-05	7.061E-05	2.316E-04	6.641E-04	1.893E-03	3.693E-03	3.307E-03
Pa-231	∑S(j):		0.000E+00	2.364E-05	7.061E-05	2.316E-04	6.641E-04	1.893E-03	3.693E-03	3.307E-03
Ac-227	Cm-243	9.976E-01	0.000E+00	7.831E-24	6.168E-22	6.914E-20	4.297E-18	2.360E-16	3.719E-15	2.368E-14
Ac-227	Cm-243	2.400E-03	0.000E+00	3.542E-31	8.383E-29	3.148E-26	5.938E-24	1.097E-21	4.558E-20	5.117E-19
Ac-227	Pu-239	1.000E+00	0.000E+00	2.186E-18	5.771E-17	1.978E-15	4.345E-14	8.927E-13	8.182E-12	4.251E-11
Ac-227	U-235	1.000E+00	0.000E+00	3.715E-07	3.245E-06	3.254E-05	2.231E-04	1.163E-03	2.767E-03	2.615E-03
Ac-227	∑S(j):		0.000E+00	3.715E-07	3.245E-06	3.254E-05	2.231E-04	1.163E-03	2.767E-03	2.615E-03

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	BRF(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
Am-243	Cm-243	2.400E-03	0.000E+00	2.216E-09	6.427E-09	1.904E-08	4.099E-08	4.550E-08	9.060E-09	1.455E-11
Co-60	Co-60	1.000E+00	9.800E-01	8.501E-01	6.397E-01	2.364E-01	1.376E-02	6.542E-07	2.915E-19	0.000E+00
Cs-137	Cs-137	1.000E+00	1.662E+01	1.580E+01	1.429E+01	1.004E+01	3.664E+00	1.076E-01	4.504E-06	2.141E-21
Eu-155	Eu-155	1.000E+00	1.200E-01	1.043E-01	7.880E-02	2.953E-02	1.788E-03	9.772E-08	6.481E-20	0.000E+00
H-3	H-3	1.000E+00	3.887E+01	9.005E+00	4.826E-01	1.695E-05	2.793E-18	0.000E+00	0.000E+00	0.000E+00
I-129	I-129	1.000E+00	2.660E+00	2.522E+00	2.267E+00	1.561E+00	5.374E-01	1.287E-02	3.011E-07	1.867E-23
Nb-94	Nb-94	1.000E+00	5.000E-02	4.997E-02	4.991E-02	4.970E-02	4.911E-02	4.708E-02	4.174E-02	2.739E-02
Ni-59	Ni-59	1.000E+00	1.680E+00	1.670E+00	1.651E+00	1.586E+00	1.415E+00	9.471E-01	3.010E-01	5.447E-03
Ni-63	Ni-63	1.000E+00	2.300E-01	2.270E-01	2.212E-01	2.021E-01	1.560E-01	6.304E-02	4.737E-03	5.506E-07
Pu-241	Pu-241	1.000E+00	4.500E-01	4.288E-01	3.893E-01	2.778E-01	1.058E-01	3.612E-03	2.328E-07	5.000E-22
`41	Pu-241	2.450E-05	1.102E-05	1.051E-05	9.539E-06	6.805E-06	2.593E-06	8.850E-08	5.703E-12	1.225E-26
.41	∑S(j):		4.500E-01	4.288E-01	3.894E-01	2.778E-01	1.058E-01	3.612E-03	2.328E-07	5.001E-22
Sb-125	Sb-125	1.000E+00	2.300E-01	8.871E-02	1.320E-02	1.676E-05	8.903E-14	9.725E-43	0.000E+00	0.000E+00
Sr-90	Sr-90	1.000E+00	4.030E+00	3.747E+00	3.239E+00	1.945E+00	4.528E-01	2.759E-03	1.293E-09	9.119E-32
Tc-99	Tc-99	1.000E+00	3.000E-01	2.900E-01	2.711E-01	2.140E-01	1.088E-01	1.022E-02	1.185E-05	6.292E-16
U-234	U-234	1.000E+00	3.187E+01	3.184E+01	3.179E+01	3.159E+01	3.105E+01	2.921E+01	2.453E+01	1.332E+01
U-234	U-238	1.000E+00	0.000E+00	1.190E-06	3.563E-06	1.180E-05	3.480E-05	1.091E-04	2.751E-04	4.983E-04
U-234	∑S(j):		3.187E+01	3.184E+01	3.179E+01	3.159E+01	3.105E+01	2.921E+01	2.453E+01	1.332E+01
Th-230	U-234	1.000E+00	0.000E+00	2.868E-04	8.595E-04	2.856E-03	8.494E-03	2.746E-02	7.558E-02	1.901E-01
Th-230	U-238	1.000E+00	0.000E+00	5.356E-12	4.815E-11	5.328E-10	4.739E-09	5.056E-08	4.055E-07	3.050E-06
Th-230	∑S(j):		0.000E+00	2.868E-04	8.595E-04	2.856E-03	8.494E-03	2.746E-02	7.558E-02	1.901E-01
Ra-226	U-234	1.000E+00	0.000E+00	6.206E-08	5.571E-07	6.133E-06	5.378E-05	5.460E-04	3.838E-03	2.010E-02
Ra-226	U-238	1.000E+00	0.000E+00	7.730E-16	2.082E-14	7.646E-13	2.016E-11	6.870E-10	1.472E-08	2.604E-07
Ra-226	∑S(j):		0.000E+00	6.206E-08	5.571E-07	6.133E-06	5.378E-05	5.460E-04	3.838E-03	2.010E-02
Pb-210	U-234	1.000E+00	0.000E+00	6.380E-10	1.691E-08	5.883E-07	1.340E-05	2.999E-04	3.054E-03	1.837E-02
Pb-210	U-238	1.000E+00	0.000E+00	5.969E-18	4.763E-16	5.584E-14	3.929E-12	3.166E-10	1.072E-08	2.311E-07
Pb-210	∑S(j):		0.000E+00	6.380E-10	1.691E-08	5.883E-07	1.340E-05	2.999E-04	3.054E-03	1.837E-02
U-238	U-238	1.000E+00	4.200E-01	4.196E-01	4.189E-01	4.164E-01	4.092E-01	3.850E-01	3.235E-01	1.760E-01

BRF(i) is the branch fraction of the parent nuclide.

RESCALC.EXE execution time = 21.08 seconds

Final Status Survey Plan
for the
Plum Brook Reactor Facility

Attachment A
Radionuclide Distribution Basis for DCGL Determination, and Final Status Survey of the Plum Brook Reactor Facility (PBRF)

Addendum 4
Results of Isotopic Analysis of Surface Soil Samples

Sample CS013004-004
Spill Area 2400303C1
Surface Soils (1st 6")
(pCi/gm)

	Result	MDA	Used	%
AM-241	1.822E-02	4.936E-02	4.94E-02	0.02%
AM243	1.347E-01	1.567E-01	1.57E-01	0.06%
C-14	1.377E+00	1.401E+00	1.40E+00	0.58%
CM-245	1.659E-01	1.590E-01	1.66E-01	0.07%
CO-60	9.387E-02	2.641E-01	2.641E-01	0.11%
CS-137	2.075E+02	4.241E-01	2.08E+02	85.26%
EU-155	1.052E-01	9.603E-01	9.603E-01	0.39%
H-3	7.497E+00	1.012E+01	1.012E+01	4.16%
I-129	8.993E-01	6.558E-01	8.99E-01	0.37%
NB-94	3.835E-02	1.926E-01	1.926E-01	0.08%
NI-63	5.589E-01	1.563E+00	1.563E+00	0.64%
PU-238	4.512E-02	1.092E-01	1.092E-01	0.04%
PU-239	1.811E-02	4.909E-02	4.909E-02	0.02%
SR-90	1.990E+01	5.885E-01	1.99E+01	8.17%
U-236	1.795E-02	4.866E-02	4.866E-02	0.02%
			2.43E+02	100.00%

Sample CS013004-005
Spill Area 2400303C1
Surface Soils (1st 6")
(pCi/gm)

	Result	MDA	Used	%
AM-241	1.648E-02	1.354E-01	1.35E-01	0.20%
AM243	9.944E-02	8.982E-02	9.94E-02	0.14%
C-14	1.435E+00	1.051E+00	1.44E+00	2.07%
CM-245	9.517E-02	1.556E-01	1.556E-01	0.22%
CO-60	2.277E-01	2.486E-01	2.486E-01	0.36%
CS-137	5.081E+01	2.355E-01	5.08E+01	73.42%
EU-155	6.000E-01	5.594E-01	6.00E-01	0.87%
H-3	1.043E+00	9.755E+00	9.755E+00	14.10%
I-129	3.374E-01	3.883E-01	3.883E-01	0.56%
NB-94	-3.178E-02	1.259E-01	1.259E-01	0.18%
NI-63	1.970E+00	1.836E+00	1.97E+00	2.85%
PU-238	1.932E-02	5.234E-02	5.234E-02	0.08%
PU-239	9.464E-03	1.165E-01	1.165E-01	0.17%
SR-90	3.200E+00	6.905E-01	3.20E+00	4.62%
U-236	1.482E-02	1.121E-01	1.121E-01	0.16%
			6.92E+01	100.00%

Sample CS013004-006
Spill Area 2400303C1
Surface Soils (1st 6")
(pCi/gm)

	Result	MDA	Used	%
AM-241	4.326E-02	3.908E-02	4.33E-02	0.02%
AM243	6.588E-02	8.926E-02	8.93E-02	0.04%
C-14	6.130E-01	1.378E+00	1.38E+00	0.67%
CM-245	7.752E-02	2.188E-01	2.188E-01	0.11%
CO-60	3.030E-02	2.529E-01	2.529E-01	0.12%
CS-137	1.744E+02	4.606E-01	1.74E+02	84.55%
EU-155	4.207E-01	9.052E-01	9.052E-01	0.44%
H-3	-1.411E-01	9.899E+00	9.899E+00	4.80%
I-129	1.256E+00	6.032E-01	1.26E+00	0.61%
NB-94	-1.763E-02	1.544E-01	1.544E-01	0.07%
NI-63	1.173E+00	1.641E+00	1.641E+00	0.80%
PU-238	8.891E-02	1.074E-01	1.074E-01	0.05%
PU-239	1.856E-01	6.289E-02	1.86E-01	0.09%
SR-90	1.566E+01	6.545E-01	1.57E+01	7.59%
U-236	2.698E-02	6.822E-02	6.822E-02	0.03%
			2.06E+02	100.00%

Sample CS013004-007
Spill Area 2400303C1
Surface Soils (1st 6")
(pCi/gm)

	Result	MDA	Used	%
AM-241	0.000E+00	6.228E-02	6.23E-02	0.24%
AM243	3.134E-02	7.924E-02	7.92E-02	0.31%
C-14	1.277E+00	1.379E+00	1.38E+00	5.34%
CM-245	2.589E-02	1.048E-01	1.05E-01	0.41%
CO-60	3.570E-02	1.939E-01	1.939E-01	0.75%
CS-137	9.349E+00	1.823E-01	9.35E+00	36.21%
EU-155	1.401E-01	3.895E-01	3.895E-01	1.51%
H-3	8.951E+00	1.029E+01	1.029E+01	39.87%
I-129	-9.881E-03	3.125E-01	3.125E-01	1.21%
NB-94	-8.472E-03	1.630E-01	1.630E-01	0.63%
NI-63	2.145E+00	1.499E+00	2.14E+00	8.31%
PU-238	-1.245E-02	1.471E-01	1.471E-01	0.57%
PU-239	2.025E-02	1.129E-01	1.129E-01	0.44%
SR-90	1.041E+00	6.891E-01	1.04E+00	4.03%
U-236	3.381E-02	4.581E-02	4.581E-02	0.18%
			2.58E+01	100.00%

Sample CS013004-008
Emergency Retention Basin
Surface Soils (1st 6")
(pCi/gm)

	Result	MDA	Used	%
AM-241	1.708E-02	1.403E-01	1.40E-01	0.20%
AM243	5.986E-03	1.224E-01	1.22E-01	0.17%
C-14	1.121E+00	1.445E+00	1.44E+00	2.02%
CM-245	-3.809E-04	1.406E-01	1.41E-01	0.20%
CO-60	7.355E-01	2.409E-01	7.36E-01	1.03%
CS-137	2.129E+01	2.536E-01	2.13E+01	29.76%
EU-155	1.728E-01	4.628E-01	4.628E-01	0.65%
H-3	4.298E+01	9.814E+00	4.30E+01	60.08%
I-129	1.526E-02	2.837E-01	2.837E-01	0.40%
NB-94	7.072E-02	2.582E-01	2.582E-01	0.36%
NI-63	2.700E+00	1.510E+00	2.70E+00	3.77%
PU-238	1.485E-02	1.220E-01	1.220E-01	0.17%
PU-239	2.250E-02	6.098E-02	6.098E-02	0.09%
SR-90	7.010E-01	6.790E-01	7.01E-01	0.98%
U-236	4.074E-02	9.868E-02	9.868E-02	0.14%
			7.15E+01	100.00%

Sample CS013004-009
Emergency Retention Basin
Surface Soils (1st 6")
(pCi/gm)

	Result	MDA	Used	%
AM-241	6.563E-02	9.722E-02	9.72E-02	0.19%
AM243	1.550E-01	5.999E-02	1.55E-01	0.30%
C-14	7.087E-01	1.331E+00	1.33E+00	2.59%
CM-245	1.759E-01	1.039E-01	1.76E-01	0.34%
CO-60	8.647E-01	2.417E-01	8.65E-01	1.68%
CS-137	3.240E+01	2.798E-01	3.24E+01	63.03%
EU-155	3.470E-01	5.541E-01	5.541E-01	1.08%
H-3	3.006E+00	1.054E+01	1.054E+01	20.51%
I-129	-1.874E-02	2.716E-01	2.716E-01	0.53%
NB-94	5.722E-02	2.256E-01	2.256E-01	0.44%
NI-63	3.210E+00	1.496E+00	3.21E+00	6.24%
PU-238	4.426E-02	1.445E-01	1.445E-01	0.28%
PU-239	-4.532E-03	1.233E-01	1.233E-01	0.24%
SR-90	1.161E+00	6.452E-01	1.16E+00	2.26%
U-236	1.475E-01	4.995E-02	1.48E-01	0.29%
			5.14E+01	100.00%

Sample CS013004-010
Emergency Retention Basin
Surface Soils (1st 6")
(pCi/gm)

	Result	MDA	Used	%
AM-241	6.704E-03	1.371E-01	1.37E-01	0.12%
AM243	5.310E-02	1.343E-01	1.34E-01	0.12%
C-14	1.210E+00	1.427E+00	1.43E+00	1.24%
CM-245	3.384E-02	2.060E-01	2.06E-01	0.18%
CO-60	5.665E+00	2.814E-01	5.67E+00	4.91%
CS-137	5.424E+01	3.064E-01	5.42E+01	47.00%
EU-155	8.057E-02	5.829E-01	5.829E-01	0.51%
H-3	2.845E+01	1.008E+01	2.85E+01	24.66%
I-129	6.859E-02	2.777E-01	2.777E-01	0.24%
NB-94	1.336E-01	3.152E-01	3.152E-01	0.27%
NI-63	1.648E+01	1.396E+00	1.65E+01	14.28%
PU-238	9.437E-02	1.140E-01	1.140E-01	0.10%
PU-239	9.854E-02	6.676E-02	9.85E-02	0.09%
SR-90	7.192E+00	6.492E-01	7.19E+00	6.23%
U-236	4.707E-02	7.696E-02	7.696E-02	0.07%
			1.15E+02	100.00%

Sample CS013004-011
Emergency Retention Basin
Surface Soils (1st 6")
(pCi/gm)

	Result	MDA	Used	%
AM-241	1.765E-01	1.437E-01	1.77E-01	0.24%
AM243	1.039E-01	9.952E-02	1.04E-01	0.14%
C-14	1.734E+00	1.524E+00	1.73E+00	2.34%
CM-245	1.124E-01	1.527E-01	1.53E-01	0.21%
CO-60	3.335E+00	2.693E-01	3.34E+00	4.50%
CS-137	3.616E+01	2.683E-01	3.62E+01	48.74%
EU-155	4.595E-02	4.476E-01	4.476E-01	0.60%
H-3	3.441E+00	9.854E+00	9.854E+00	13.28%
I-129	8.316E-02	2.687E-01	2.687E-01	0.36%
NB-94	2.923E-01	2.079E-01	2.92E-01	0.39%
NI-63	1.397E+01	1.395E+00	1.40E+01	18.83%
PU-238	7.927E-02	7.159E-02	7.93E-02	0.11%
PU-239	1.321E-01	7.159E-02	1.32E-01	0.18%
SR-90	7.437E+00	6.639E-01	7.44E+00	10.03%
U-236	4.962E-02	4.482E-02	4.96E-02	0.07%
			7.42E+01	100.00%

	MEAN	STANDARD DEVIATION
AM-241	0.15%	0.09%
AM243	0.16%	0.10%
C-14	2.11%	1.51%
CM-245	0.22%	0.11%
CO-60	1.68%	1.94%
CS-137	58.50%	21.34%
EU-155	0.76%	0.38%
H-3	22.68%	19.00%
I-129	0.53%	0.30%
NB-94	0.30%	0.19%
NI-63	6.96%	6.56%
PU-238	0.17%	0.18%
PU-239	0.16%	0.13%
SR-90	5.49%	3.08%
U-236	0.12%	0.09%

Final Status Survey Plan
for the
Plum Brook Reactor Facility

Attachment A
Radionuclide Distribution Basis for DCGL Determination, and Final Status Survey of the Plum Brook Reactor Facility (PBRF)

Addendum 5
RESRAD Models Used for Evaluation of Soil Radionuclide Distribution

Table of Contents

Part I: Mixture Sums and Single Radionuclide Guidelines

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

Parameter	Current Value	Default	Para Na
Dose conversion factors for inhalation, mrem/pCi:			
Ac-227+D	6.720E+00	6.720E+00	DCF2(
Am-241	4.440E-01	4.440E-01	DCF2(
Am-243+D	4.400E-01	4.400E-01	DCF2(
C-14	2.090E-06	2.090E-06	DCF2(
Cm-245	4.550E-01	4.550E-01	DCF2(
Co-60	2.190E-04	2.190E-04	DCF2(
Cs-137+D	3.190E-05	3.190E-05	DCF2(
Eu-155	4.140E-05	4.140E-05	DCF2(
H-3	6.400E-08	6.400E-08	DCF2(
Nb-94	4.140E-04	4.140E-04	DCF2(
Ni-63	6.290E-06	6.290E-06	DCF2(
Np-237+D	5.400E-01	5.400E-01	DCF2(
Pa-231	1.280E+00	1.280E+00	DCF2(
Pb-210+D	2.320E-02	2.320E-02	DCF2(
Pu-238	3.920E-01	3.920E-01	DCF2(
Pu-239	4.290E-01	4.290E-01	DCF2(
Pu-241+D	8.250E-03	8.250E-03	DCF2(
Ra-226+D	8.600E-03	8.600E-03	DCF2(
Ra-228+D	5.080E-03	5.080E-03	DCF2(
Sr-90+D	1.310E-03	1.310E-03	DCF2(
[illegible]-228+D	3.450E-01	3.450E-01	DCF2(
[illegible]-229+D	2.160E+00	2.160E+00	DCF2(
Th-230	3.260E-01	3.260E-01	DCF2(
Th-232	1.640E+00	1.640E+00	DCF2(
U-233	1.350E-01	1.350E-01	DCF2(
U-234	1.320E-01	1.320E-01	DCF2(
U-235+D	1.230E-01	1.230E-01	DCF2(
U-236	1.250E-01	1.250E-01	DCF2(
Dose conversion factors for ingestion, mrem/pCi:			
Ac-227+D	1.480E-02	1.480E-02	DCF3(
Am-241	3.640E-03	3.640E-03	DCF3(
Am-243+D	3.630E-03	3.630E-03	DCF3(
C-14	2.090E-06	2.090E-06	DCF3(
Cm-245	3.740E-03	3.740E-03	DCF3(
Co-60	2.690E-05	2.690E-05	DCF3(
Cs-137+D	5.000E-05	5.000E-05	DCF3(
Eu-155	1.530E-06	1.530E-06	DCF3(
H-3	6.400E-08	6.400E-08	DCF3(
Nb-94	7.140E-06	7.140E-06	DCF3(
Ni-63	5.770E-07	5.770E-07	DCF3(
Np-237+D	4.440E-03	4.440E-03	DCF3(
Pa-231	1.060E-02	1.060E-02	DCF3(
Pb-210+D	7.270E-03	7.270E-03	DCF3(
Pu-238	3.200E-03	3.200E-03	DCF3(
[illegible]239	3.540E-03	3.540E-03	DCF3(
[illegible]241+D	6.850E-05	6.850E-05	DCF3(
Ra-226+D	1.330E-03	1.330E-03	DCF3(
Ra-228+D	1.440E-03	1.440E-03	DCF3(
Sr-90+D	1.530E-04	1.530E-04	DCF3(

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

Parameter	Current Value	Default	Para Na
Th-228+D	8.080E-04	8.080E-04	DCF3(
Th-229+D	4.030E-03	4.030E-03	DCF3(
Th-230	5.480E-04	5.480E-04	DCF3(
Th-232	2.730E-03	2.730E-03	DCF3(
U-233	2.890E-04	2.890E-04	DCF3(
U-234	2.830E-04	2.830E-04	DCF3(
U-235+D	2.670E-04	2.670E-04	DCF3(
U-236	2.690E-04	2.690E-04	DCF3(
Food transfer factors:			
Ac-227+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(
Ac-227+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(
Ac-227+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(
Am-241 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(
Am-241 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-05	5.000E-05	RTF(
Am-241 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(
Am-243+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(
Am-243+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-05	5.000E-05	RTF(
Am-243+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(
C-14 , plant/soil concentration ratio, dimensionless	5.500E+00	5.500E+00	RTF(
C-14 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.100E-02	3.100E-02	RTF(
C-14 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.200E-02	1.200E-02	RTF(
Cm-245 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(
Cm-245 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(
Cm-245 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(
Co-60 , plant/soil concentration ratio, dimensionless	8.000E-02	8.000E-02	RTF(
Co-60 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-02	2.000E-02	RTF(
Co-60 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(
Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(
Cs-137+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(
Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(
Eu-155 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(
Eu-155 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(
Eu-155 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(
H-3 , plant/soil concentration ratio, dimensionless	4.800E+00	4.800E+00	RTF(1
H-3 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.200E-02	1.200E-02	RTF(1
H-3 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-02	1.000E-02	RTF(1
Nb-94 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(1
Nb-94 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-07	3.000E-07	RTF(1
Nb-94 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(1

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

Parameter	Current Value	Default	Para Na
Ni-63 , plant/soil concentration ratio, dimensionless	5.000E-02	5.000E-02	RTF(1
Ni-63 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(1
Ni-63 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-02	2.000E-02	RTF(1
Np-237+D , plant/soil concentration ratio, dimensionless	2.000E-02	2.000E-02	RTF(1
Np-237+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(1
Np-237+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(1
Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(1
Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(1
Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(1
Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(1
Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(1
Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(1
Pu-238 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(1
Pu-238 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(1
Pu-238 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(1
Pu-239 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(1
Pu-239 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(1
Pu-239 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(1
Pu-241+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(1
Pu-241+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(1
Pu-241+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(1
Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(2
Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(2
Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(2
Ra-228+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(2
Ra-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(2
Ra-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(2
Sr-90+D , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF(2
Sr-90+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-03	8.000E-03	RTF(2
Sr-90+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(2
Th-228+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(2
Th-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(2
Th-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(2
Th-229+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(2
Th-229+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(2
Th-229+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(2
Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(2
Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(2
Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(2

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

Parameter	Current Value	Default	Para Na
Th-232 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(2
Th-232 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(2
Th-232 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(2
U-233 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(2
U-233 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(2
U-233 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(2
U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(2
U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(2
U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(2
U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(2
U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(2
U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(2
U-236 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(3
U-236 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(3
U-236 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(3
Bioaccumulation factors, fresh water, L/kg:			
[illegible]-227+D , fish	1.500E+01	1.500E+01	BIOFA
[illegible]-227+D , crustacea and mollusks	1.000E+03	1.000E+03	BIOFA
Am-241 , fish	3.000E+01	3.000E+01	BIOFA
Am-241 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFA
Am-243+D , fish	3.000E+01	3.000E+01	BIOFA
Am-243+D , crustacea and mollusks	1.000E+03	1.000E+03	BIOFA
C-14 , fish	5.000E+04	5.000E+04	BIOFA
C-14 , crustacea and mollusks	9.100E+03	9.100E+03	BIOFA
Cm-245 , fish	3.000E+01	3.000E+01	BIOFA
Cm-245 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFA
Co-60 , fish	3.000E+02	3.000E+02	BIOFA
Co-60 , crustacea and mollusks	2.000E+02	2.000E+02	BIOFA
Cs-137+D , fish	2.000E+03	2.000E+03	BIOFA
Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFA
Eu-155 , fish	5.000E+01	5.000E+01	BIOFA
Eu-155 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFA
H-3 , fish	1.000E+00	1.000E+00	BIOFA
[illegible] , crustacea and mollusks	1.000E+00	1.000E+00	BIOFA
Nb-94 , fish	3.000E+02	3.000E+02	BIOFA
Nb-94 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFA

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

Parameter	Current Value	Default	Para Na
Ni-63 , fish	1.000E+02	1.000E+02	BIOFA
Ni-63 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFA
Np-237+D , fish	3.000E+01	3.000E+01	BIOFA
Np-237+D , crustacea and mollusks	4.000E+02	4.000E+02	BIOFA
Pa-231 , fish	1.000E+01	1.000E+01	BIOFA
Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIOFA
Pb-210+D , fish	3.000E+02	3.000E+02	BIOFA
Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFA
Pu-238 , fish	3.000E+01	3.000E+01	BIOFA
Pu-238 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFA
Pu-239 , fish	3.000E+01	3.000E+01	BIOFA
Pu-239 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFA
Pu-241+D , fish	3.000E+01	3.000E+01	BIOFA
Pu-241+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFA
[illegible]-226+D , fish	5.000E+01	5.000E+01	BIOFA
[illegible]-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFA
Ra-228+D , fish	5.000E+01	5.000E+01	BIOFA
Ra-228+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFA
Sr-90+D , fish	6.000E+01	6.000E+01	BIOFA
Sr-90+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFA
Th-228+D , fish	1.000E+02	1.000E+02	BIOFA
Th-228+D , crustacea and mollusks	5.000E+02	5.000E+02	BIOFA
Th-229+D , fish	1.000E+02	1.000E+02	BIOFA
Th-229+D , crustacea and mollusks	5.000E+02	5.000E+02	BIOFA
Th-230 , fish	1.000E+02	1.000E+02	BIOFA
Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFA
Th-232 , fish	1.000E+02	1.000E+02	BIOFA
Th-232 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFA
U-233 , fish	1.000E+01	1.000E+01	BIOFA
U-233 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFA
U-234 , fish	1.000E+01	1.000E+01	BIOFA
U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFA
U-235+D , fish	1.000E+01	1.000E+01	BIOFA
U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFA

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

	Parameter	Current Value	Default	Para Na
	U-236 , fish	1.000E+01	1.000E+01	BIOFA
	U-236 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFA

Site-Specific Parameter Summary

	Parameter	User Input	Default	Used by (If different fr
1	Area of contaminated zone (m**2)	1.024E+05	1.000E+04	---
1	Thickness of contaminated zone (m)	1.500E-01	2.000E+00	---
1	Length parallel to aquifer flow (m)	3.650E+02	1.000E+02	---
1	Basic radiation dose limit (mrem/yr)	2.500E+01	2.500E+01	---
.	Time since placement of material (yr)	0.000E+00	0.000E+00	---
.	Times for calculations (yr)	1.000E+00	1.000E+00	---
.	Times for calculations (yr)	3.000E+00	3.000E+00	---
.	Times for calculations (yr)	1.000E+01	1.000E+01	---
.	Times for calculations (yr)	3.000E+01	3.000E+01	---
	Times for calculations (yr)	3.300E+01	1.000E+02	---
	Times for calculations (yr)	1.000E+02	3.000E+02	---
	Times for calculations (yr)	3.000E+02	1.000E+03	---
	Times for calculations (yr)	1.000E+03	0.000E+00	---
	Times for calculations (yr)	not used	0.000E+00	---
	Initial principal radionuclide (pCi/g): Am-241	1.500E-01	0.000E+00	---
	Initial principal radionuclide (pCi/g): Am-243	1.600E-01	0.000E+00	---
	Initial principal radionuclide (pCi/g): C-14	2.110E+00	0.000E+00	---
	Initial principal radionuclide (pCi/g): Cm-245	2.200E-01	0.000E+00	---
	Initial principal radionuclide (pCi/g): Co-60	1.680E+00	0.000E+00	---
	Initial principal radionuclide (pCi/g): Cs-137	5.850E+01	0.000E+00	---
	Initial principal radionuclide (pCi/g): Eu-155	7.600E-01	0.000E+00	---
	Initial principal radionuclide (pCi/g): H-3	2.268E+01	0.000E+00	---
	Initial principal radionuclide (pCi/g): Nb-94	3.000E-01	0.000E+00	---
	Initial principal radionuclide (pCi/g): Ni-63	6.960E+00	0.000E+00	---
	Initial principal radionuclide (pCi/g): Pu-238	1.700E-01	0.000E+00	---
	Initial principal radionuclide (pCi/g): Pu-239	1.600E-01	0.000E+00	---
	Initial principal radionuclide (pCi/g): Sr-90	5.490E+00	0.000E+00	---
	Initial principal radionuclide (pCi/g): U-236	1.200E-01	0.000E+00	---
	Concentration in groundwater (pCi/L): Am-241	not used	0.000E+00	---
	Concentration in groundwater (pCi/L): Am-243	not used	0.000E+00	---
	Concentration in groundwater (pCi/L): C-14	not used	0.000E+00	---
	Concentration in groundwater (pCi/L): Cm-245	not used	0.000E+00	---
	Concentration in groundwater (pCi/L): Co-60	not used	0.000E+00	---
	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---
	Concentration in groundwater (pCi/L): Eu-155	not used	0.000E+00	---
	Concentration in groundwater (pCi/L): H-3	not used	0.000E+00	---
	Concentration in groundwater (pCi/L): Nb-94	not used	0.000E+00	---
	Concentration in groundwater (pCi/L): Ni-63	not used	0.000E+00	---
	Concentration in groundwater (pCi/L): Pu-238	not used	0.000E+00	---
	Concentration in groundwater (pCi/L): Pu-239	not used	0.000E+00	---
	Concentration in groundwater (pCi/L): Sr-90	not used	0.000E+00	---
	Concentration in groundwater (pCi/L): U-236	not used	0.000E+00	---
	Cover depth (m)	0.000E+00	0.000E+00	---
	Density of cover material (g/cm**3)	not used	1.500E+00	---
	Cover depth erosion rate (m/yr)	not used	1.000E-03	---
	Density of contaminated zone (g/cm**3)	1.560E+00	1.500E+00	---
	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---
	Contaminated zone total porosity	4.100E-01	4.000E-01	---
	Contaminated zone field capacity	2.000E-01	2.000E-01	---

Site-Specific Parameter Summary (continued)

Parameter	User Input	Default	Used by (If different fr
Contaminated zone hydraulic conductivity (m/yr)	1.262E+03	1.000E+01	---
Contaminated zone b parameter	1.400E+00	5.300E+00	---
Average annual wind speed (m/sec)	2.000E+00	2.000E+00	---
Humidity in air (g/m**3)	8.000E+00	8.000E+00	---
Evapotranspiration coefficient	5.000E-01	5.000E-01	---
Precipitation (m/yr)	8.600E-01	1.000E+00	---
Irrigation (m/yr)	1.040E+00	2.000E-01	---
Irrigation mode	overhead	overhead	---
Runoff coefficient	2.000E-01	2.000E-01	---
Watershed area for nearby stream or pond (m**2)	1.000E+06	1.000E+06	---
Accuracy for water/soil computations	1.000E-03	1.000E-03	---
Density of saturated zone (g/cm**3)	1.460E+00	1.500E+00	---
Saturated zone total porosity	4.500E-01	4.000E-01	---
Saturated zone effective porosity	2.000E-01	2.000E-01	---
Saturated zone field capacity	2.000E-01	2.000E-01	---
Saturated zone hydraulic conductivity (m/yr)	1.070E+03	1.000E+02	---
Saturated zone hydraulic gradient	4.500E-03	2.000E-02	---
Saturated zone b parameter	not used	5.300E+00	---
Water table drop rate (m/yr)	0.000E+00	1.000E-03	---
Well pump intake depth (m below water table)	2.010E+00	1.000E+01	---
Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---
ell pumping rate (m**3/yr)	1.180E+02	2.500E+02	---
Number of unsaturated zone strata	1	1	---
Unsat. zone 1, thickness (m)	3.000E+00	4.000E+00	---
Unsat. zone 1, soil density (g/cm**3)	1.560E+00	1.500E+00	---
Unsat. zone 1, total porosity	4.100E-01	4.000E-01	---
Unsat. zone 1, effective porosity	3.000E-01	2.000E-01	---
Unsat. zone 1, field capacity	2.000E-01	2.000E-01	---
Unsat. zone 1, soil-specific b parameter	1.400E+00	5.300E+00	---
Unsat. zone 1, hydraulic conductivity (m/yr)	1.262E+03	1.000E+01	---
Distribution coefficients for Am-241			
Contaminated zone (cm**3/g)	1.445E+03	2.000E+01	---
Unsaturated zone 1 (cm**3/g)	1.445E+03	2.000E+01	---
Saturated zone (cm**3/g)	1.445E+03	2.000E+01	---
Leach rate (/yr)	0.000E+00	0.000E+00	2.555E
Solubility constant	1.445E+03	0.000E+00	Sol. Kd =-1.282
Distribution coefficients for Am-243			
Contaminated zone (cm**3/g)	1.445E+03	2.000E+01	---
Unsaturated zone 1 (cm**3/g)	1.445E+03	2.000E+01	---
Saturated zone (cm**3/g)	1.445E+03	2.000E+01	---
Leach rate (/yr)	0.000E+00	0.000E+00	2.555E
Solubility constant	0.000E+00	0.000E+00	not us

Site-Specific Parameter Summary (continued)

Parameter	User Input	Default	Used by (If different fr
Distribution coefficients for C-14			
Contaminated zone (cm**3/g)	2.100E+01	0.000E+00	---
Unsaturated zone 1 (cm**3/g)	2.100E+01	0.000E+00	---
Saturated zone (cm**3/g)	2.100E+01	0.000E+00	---
Leach rate (/yr)	0.000E+00	0.000E+00	1.748E
Solubility constant	0.000E+00	0.000E+00	not us
Distribution coefficients for Cm-245			
Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	1.378E
Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E
Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	1.378E
Leach rate (/yr)	0.000E+00	0.000E+00	2.679E
Solubility constant	0.000E+00	0.000E+00	not us
Distribution coefficients for Co-60			
Contaminated zone (cm**3/g)	1.000E+03	1.000E+03	---
Unsaturated zone 1 (cm**3/g)	1.000E+03	1.000E+03	---
Saturated zone (cm**3/g)	1.000E+03	1.000E+03	---
Leach rate (/yr)	0.000E+00	0.000E+00	3.692E
Solubility constant	0.000E+00	0.000E+00	not us
Distribution coefficients for Cs-137			
Contaminated zone (cm**3/g)	4.470E+02	1.000E+03	---
Unsaturated zone 1 (cm**3/g)	4.470E+02	1.000E+03	---
Saturated zone (cm**3/g)	4.470E+02	1.000E+03	---
Leach rate (/yr)	0.000E+00	0.000E+00	8.258E
Solubility constant	0.000E+00	0.000E+00	not us
Distribution coefficients for Eu-155			
Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E
Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E
Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E
Leach rate (/yr)	0.000E+00	0.000E+00	4.476E
Solubility constant	0.000E+00	0.000E+00	not us
Distribution coefficients for H-3			
Contaminated zone (cm**3/g)	0.000E+00	0.000E+00	---
Unsaturated zone 1 (cm**3/g)	0.000E+00	0.000E+00	---
Saturated zone (cm**3/g)	0.000E+00	0.000E+00	---
Leach rate (/yr)	0.000E+00	0.000E+00	2.880E
Solubility constant	0.000E+00	0.000E+00	not us
Distribution coefficients for Nb-94			
Contaminated zone (cm**3/g)	6.310E+02	0.000E+00	---
Unsaturated zone 1 (cm**3/g)	6.310E+02	0.000E+00	---
Saturated zone (cm**3/g)	6.310E+02	0.000E+00	---
Leach rate (/yr)	0.000E+00	0.000E+00	5.850E
Solubility constant	0.000E+00	0.000E+00	not us

Site-Specific Parameter Summary (continued)

	Parameter	User Input	Default	Used by (If different fr
6	Distribution coefficients for Ni-63			
5	Contaminated zone (cm**3/g)	3.700E+01	1.000E+03	---
5	Unsaturated zone 1 (cm**3/g)	3.700E+01	1.000E+03	---
5	Saturated zone (cm**3/g)	3.700E+01	1.000E+03	---
5	Leach rate (/yr)	0.000E+00	0.000E+00	9.945E
5	Solubility constant	0.000E+00	0.000E+00	not us
5	Distribution coefficients for Pu-238			
5	Contaminated zone (cm**3/g)	9.540E+02	2.000E+03	---
5	Unsaturated zone 1 (cm**3/g)	9.540E+02	2.000E+03	---
5	Saturated zone (cm**3/g)	9.540E+02	2.000E+03	---
5	Leach rate (/yr)	0.000E+00	0.000E+00	3.870E
5	Solubility constant	0.000E+00	0.000E+00	not us
	Distribution coefficients for Pu-239			
	Contaminated zone (cm**3/g)	9.540E+02	2.000E+03	---
	Unsaturated zone 1 (cm**3/g)	9.540E+02	2.000E+03	---
	Saturated zone (cm**3/g)	9.540E+02	2.000E+03	---
	Leach rate (/yr)	0.000E+00	0.000E+00	3.870E
	Solubility constant	0.000E+00	0.000E+00	not us
	Distribution coefficients for Sr-90			
	Contaminated zone (cm**3/g)	3.200E+01	3.000E+01	---
	Unsaturated zone 1 (cm**3/g)	3.200E+01	3.000E+01	---
	Saturated zone (cm**3/g)	3.200E+01	3.000E+01	---
	Leach rate (/yr)	0.000E+00	0.000E+00	1.149E
	Solubility constant	0.000E+00	0.000E+00	not us
	Distribution coefficients for U-236			
	Contaminated zone (cm**3/g)	1.250E+02	5.000E+01	---
	Unsaturated zone 1 (cm**3/g)	1.250E+02	5.000E+01	---
	Saturated zone (cm**3/g)	1.250E+02	5.000E+01	---
	Leach rate (/yr)	0.000E+00	0.000E+00	2.951E
	Solubility constant	0.000E+00	0.000E+00	not us
	Distribution coefficients for daughter Ac-227			
	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---
	Unsaturated zone 1 (cm**3/g)	2.000E+01	2.000E+01	---
	Saturated zone (cm**3/g)	2.000E+01	2.000E+01	---
	Leach rate (/yr)	0.000E+00	0.000E+00	1.834E
	Solubility constant	0.000E+00	0.000E+00	not us
	Distribution coefficients for daughter Np-237			
	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	2.574E
	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	2.574E
	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	2.574E
	Leach rate (/yr)	0.000E+00	0.000E+00	1.434E
	Solubility constant	0.000E+00	0.000E+00	not us

Site-Specific Parameter Summary (continued)

Parameter	User Input	Default	Used by (If different fr
Distribution coefficients for daughter Pa-231			
Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---
Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---
Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---
Leach rate (/yr)	0.000E+00	0.000E+00	7.366E
Solubility constant	0.000E+00	0.000E+00	not us
Distribution coefficients for daughter Pb-210			
Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---
Unsaturated zone 1 (cm**3/g)	1.000E+02	1.000E+02	---
Saturated zone (cm**3/g)	1.000E+02	1.000E+02	---
Leach rate (/yr)	0.000E+00	0.000E+00	3.688E
Solubility constant	0.000E+00	0.000E+00	not us
Distribution coefficients for daughter Pu-241			
Contaminated zone (cm**3/g)	9.540E+02	2.000E+03	---
Unsaturated zone 1 (cm**3/g)	9.540E+02	2.000E+03	---
Saturated zone (cm**3/g)	9.540E+02	2.000E+03	---
Leach rate (/yr)	0.000E+00	0.000E+00	3.870E
Solubility constant	0.000E+00	0.000E+00	not us
Distribution coefficients for daughter Pu-241			
Contaminated zone (cm**3/g)	9.540E+02	2.000E+03	---
Unsaturated zone 1 (cm**3/g)	9.540E+02	2.000E+03	---
Saturated zone (cm**3/g)	9.540E+02	2.000E+03	---
Leach rate (/yr)	0.000E+00	0.000E+00	3.870E
Solubility constant	0.000E+00	0.000E+00	not us
Distribution coefficients for daughter Ra-226			
Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---
Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	---
Saturated zone (cm**3/g)	7.000E+01	7.000E+01	---
Leach rate (/yr)	0.000E+00	0.000E+00	5.265E
Solubility constant	0.000E+00	0.000E+00	not us
Distribution coefficients for daughter Ra-228			
Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---
Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	---
Saturated zone (cm**3/g)	7.000E+01	7.000E+01	---
Leach rate (/yr)	0.000E+00	0.000E+00	5.265E
Solubility constant	0.000E+00	0.000E+00	not us
Distribution coefficients for daughter Th-228			
Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---
Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	---
Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---
Leach rate (/yr)	0.000E+00	0.000E+00	6.154E
Solubility constant	0.000E+00	0.000E+00	not us

Site-Specific Parameter Summary (continued)

	Parameter	User Input	Default	Used by (If different fr
6	Distribution coefficients for daughter Th-229			
6	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---
6	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	---
6	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---
6	Leach rate (/yr)	0.000E+00	0.000E+00	6.154E
6	Solubility constant	0.000E+00	0.000E+00	not us
6	Distribution coefficients for daughter Th-230			
5	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---
5	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	---
5	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---
5	Leach rate (/yr)	0.000E+00	0.000E+00	6.154E
5	Solubility constant	0.000E+00	0.000E+00	not us
;	Distribution coefficients for daughter Th-232			
;	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---
;	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	---
;	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---
;	Leach rate (/yr)	0.000E+00	0.000E+00	6.154E
:	Solubility constant	0.000E+00	0.000E+00	not us
	Distribution coefficients for daughter U-233			
	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---
	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---
	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---
	Leach rate (/yr)	0.000E+00	0.000E+00	7.366E
	Solubility constant	0.000E+00	0.000E+00	not us
	Distribution coefficients for daughter U-234			
	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---
	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---
	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---
	Leach rate (/yr)	0.000E+00	0.000E+00	7.366E
	Solubility constant	0.000E+00	0.000E+00	not us
	Distribution coefficients for daughter U-235			
	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---
	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---
	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---
	Leach rate (/yr)	0.000E+00	0.000E+00	7.366E
	Solubility constant	0.000E+00	0.000E+00	not us
	Inhalation rate (m**3/yr)	8.400E+03	8.400E+03	---
	Mass loading for inhalation (g/m**3)	6.000E-06	1.000E-04	---
	Exposure duration	3.653E+02	3.000E+01	---
	Shielding factor, inhalation	4.000E-01	4.000E-01	---
	Shielding factor, external gamma	4.700E-01	7.000E-01	---
	ction of time spent indoors	6.600E-01	5.000E-01	---
	ction of time spent outdoors (on site)	1.100E-01	2.500E-01	---
	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circ

Site-Specific Parameter Summary (continued)

	Parameter	User Input	Default	Used by (If different fr
7	Radii of shape factor array (used if FS = -1):			
7	Outer annular radius (m), ring 1:	not used	5.000E+01	---
7	Outer annular radius (m), ring 2:	not used	7.071E+01	---
7	Outer annular radius (m), ring 3:	not used	0.000E+00	---
7	Outer annular radius (m), ring 4:	not used	0.000E+00	---
7	Outer annular radius (m), ring 5:	not used	0.000E+00	---
7	Outer annular radius (m), ring 6:	not used	0.000E+00	---
7	Outer annular radius (m), ring 7:	not used	0.000E+00	---
7	Outer annular radius (m), ring 8:	not used	0.000E+00	---
7	Outer annular radius (m), ring 9:	not used	0.000E+00	---
7	Outer annular radius (m), ring 10:	not used	0.000E+00	---
7	Outer annular radius (m), ring 11:	not used	0.000E+00	---
7	Outer annular radius (m), ring 12:	not used	0.000E+00	---
	Fractions of annular areas within AREA:			
	Ring 1	not used	1.000E+00	---
	Ring 2	not used	2.732E-01	---
	Ring 3	not used	0.000E+00	---
	Ring 4	not used	0.000E+00	---
	Ring 5	not used	0.000E+00	---
	Ring 6	not used	0.000E+00	---
	Ring 7	not used	0.000E+00	---
	Ring 8	not used	0.000E+00	---
	Ring 9	not used	0.000E+00	---
	Ring 10	not used	0.000E+00	---
	Ring 11	not used	0.000E+00	---
	Ring 12	not used	0.000E+00	---
	Fruits, vegetables and grain consumption (kg/yr)	7.800E+01	1.600E+02	---
	Leafy vegetable consumption (kg/yr)	1.500E+01	1.400E+01	---
	Milk consumption (L/yr)	1.180E+02	9.200E+01	---
	Meat and poultry consumption (kg/yr)	5.200E+01	6.300E+01	---
	Fish consumption (kg/yr)	1.600E+01	5.400E+00	---
	Other seafood consumption (kg/yr)	0.000E+00	9.000E-01	---
	Soil ingestion rate (g/yr)	1.830E+01	3.650E+01	---
	Drinking water intake (L/yr)	4.780E+02	5.100E+02	---
	Contamination fraction of drinking water	1.000E+00	1.000E+00	---
	Contamination fraction of household water	not used	1.000E+00	---
	Contamination fraction of livestock water	1.000E+00	1.000E+00	---
	Contamination fraction of irrigation water	1.000E+00	1.000E+00	---
	Contamination fraction of aquatic food	5.000E-01	5.000E-01	---
	Contamination fraction of plant food	1.000E+00	-1	---
	Contamination fraction of meat	1.000E+00	-1	---
	Contamination fraction of milk	1.000E+00	-1	---
	Livestock fodder intake for meat (kg/day)	8.500E+00	6.800E+01	---
	Livestock fodder intake for milk (kg/day)	1.700E+01	5.500E+01	---
	Livestock water intake for meat (L/day)	5.000E+01	5.000E+01	---
	Livestock water intake for milk (L/day)	1.600E+02	1.600E+02	---
	Livestock soil intake (kg/day)	5.000E-01	5.000E-01	---
	Mass loading for foliar deposition (g/m**3)	1.000E-04	1.000E-04	---

Site-Specific Parameter Summary (continued)

	Parameter	User Input	Default	Used by (If different fr
9	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---
9	Depth of roots (m)	9.000E-01	9.000E-01	---
9	Drinking water fraction from ground water	1.000E+00	1.000E+00	---
9	Household water fraction from ground water	not used	1.000E+00	---
9	Livestock water fraction from ground water	1.000E+00	1.000E+00	---
9	Irrigation fraction from ground water	1.000E+00	1.000E+00	---
3	Wet weight crop yield for Non-Leafy (kg/m**2)	7.000E-01	7.000E-01	---
3	Wet weight crop yield for Leafy (kg/m**2)	1.500E+00	1.500E+00	---
3	Wet weight crop yield for Fodder (kg/m**2)	1.100E+00	1.100E+00	---
3	Growing Season for Non-Leafy (years)	1.700E-01	1.700E-01	---
3	Growing Season for Leafy (years)	2.500E-01	2.500E-01	---
3	Growing Season for Fodder (years)	8.000E-02	8.000E-02	---
3	Translocation Factor for Non-Leafy	1.000E-01	1.000E-01	---
3	Translocation Factor for Leafy	1.000E+00	1.000E+00	---
3	Translocation Factor for Fodder	1.000E+00	1.000E+00	---
3	Dry Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---
3	Dry Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---
3	Dry Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---
3	Wet Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---
3	Wet Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---
3	Wet Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---
	eathering Removal Constant for Vegetation	2.000E+01	2.000E+01	---
	C-12 concentration in water (g/cm**3)	2.000E-05	2.000E-05	---
	C-12 concentration in contaminated soil (g/g)	3.000E-02	3.000E-02	---
	Fraction of vegetation carbon from soil	2.000E-02	2.000E-02	---
	Fraction of vegetation carbon from air	9.800E-01	9.800E-01	---
	C-14 evasion layer thickness in soil (m)	3.000E-01	3.000E-01	---
	C-14 evasion flux rate from soil (1/sec)	7.000E-07	7.000E-07	---
	C-12 evasion flux rate from soil (1/sec)	1.000E-10	1.000E-10	---
	Fraction of grain in beef cattle feed	8.000E-01	8.000E-01	---
	Fraction of grain in milk cow feed	2.000E-01	2.000E-01	---
	DCF correction factor for gaseous forms of C14	8.894E+01	8.894E+01	---
	Storage times of contaminated foodstuffs (days):			
	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---
	Leafy vegetables	1.000E+00	1.000E+00	---
	Milk	1.000E+00	1.000E+00	---
	Meat and poultry	2.000E+01	2.000E+01	---
	Fish	7.000E+00	7.000E+00	---
	Crustacea and mollusks	7.000E+00	7.000E+00	---
	Well water	1.000E+00	1.000E+00	---
	Surface water	1.000E+00	1.000E+00	---
	Livestock fodder	4.500E+01	4.500E+01	---
	Thickness of building foundation (m)	not used	1.500E-01	---
	lk density of building foundation (g/cm**3)	not used	2.400E+00	---
	al porosity of the cover material	not used	4.000E-01	---
	Total porosity of the building foundation	not used	1.000E-01	---
	Volumetric water content of the cover material	not used	5.000E-02	---

Site-Specific Parameter Summary (continued)

	Parameter	User Input	Default	Used by (If different fr
1	Volumetric water content of the foundation	not used	3.000E-02	---
1	Diffusion coefficient for radon gas (m/sec):			
1	in cover material	not used	2.000E-06	---
!	in foundation material	not used	3.000E-07	---
.	in contaminated zone soil	not used	2.000E-06	---
.	Radon vertical dimension of mixing (m)	not used	2.000E+00	---
.	Average building air exchange rate (1/hr)	not used	5.000E-01	---
.	Height of the building (room) (m)	not used	2.500E+00	---
	Building interior area factor	not used	0.000E+00	---
	Building depth below ground surface (m)	not used	-1.000E+00	---
	Emanating power of Rn-222 gas	not used	2.500E-01	---
	Emanating power of Rn-220 gas	not used	1.500E-01	---
	Number of graphical time points	32	---	---
	Maximum number of integration points for dose	17	---	---
	Maximum number of integration points for risk	257	---	---

Summary of Pathway Selections

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

Contaminated Zone Dimensions	
Area:	102400.00 square meters
ness:	0.15 meters
er Depth:	0.00 meters

Initial Soil Concentrations, pCi/g	
Am-241	1.500E-01
Am-243	1.600E-01
C-14	2.110E+00
Cm-245	2.200E-01
Co-60	1.680E+00
Cs-137	5.850E+01
Eu-155	7.600E-01
H-3	2.268E+01
Nb-94	3.000E-01
Ni-63	6.960E+00
Pu-238	1.700E-01
Pu-239	1.600E-01
Sr-90	5.490E+00
U-236	1.200E-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)

(years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	3.300E+01	1.000E+02	3.000E
TDOSE(t):	9.484E+01	8.990E+01	8.205E+01	6.139E+01	3.000E+01	2.707E+01	2.517E+00	1.259E
M(t):	3.793E+00	3.596E+00	3.282E+00	2.456E+00	1.200E+00	1.083E+00	1.007E-01	5.036E

num TDOSE(t): 9.484E+01 mrem/yr at t = 0.000E+00 years

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

Water Independent Pathways (Inhalation excludes radon)

io-lide	Ground		Inhalation		Radon		Plant		Meat	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
241	2.744E-03	0.0000	2.674E-04	0.0000	0.000E+00	0.0000	8.515E-03	0.0001	7.084E-04	0.0000
243	5.809E-02	0.0006	2.828E-04	0.0000	0.000E+00	0.0000	9.064E-03	0.0001	7.541E-04	0.0000
1	5.416E-07	0.0000	9.582E-05	0.0000	0.000E+00	0.0000	1.652E-01	0.0017	1.657E-01	0.0017
245	3.063E-02	0.0003	4.023E-04	0.0000	0.000E+00	0.0000	1.285E-02	0.0001	4.282E-04	0.0000
50	9.033E+00	0.0952	1.384E-06	0.0000	0.000E+00	0.0000	5.227E-02	0.0006	2.690E-02	0.0003
.37	7.358E+01	0.7759	7.391E-06	0.0000	0.000E+00	0.0000	1.781E+00	0.0188	2.495E+00	0.0263
.55	5.348E-02	0.0006	1.179E-07	0.0000	0.000E+00	0.0000	4.203E-05	0.0000	5.656E-05	0.0000
	0.000E+00	0.0000	1.601E-03	0.0000	0.000E+00	0.0000	3.879E-03	0.0000	6.218E-04	0.0000
14	1.073E+00	0.0113	4.982E-07	0.0000	0.000E+00	0.0000	3.304E-04	0.0000	1.709E-08	0.0000
13	0.000E+00	0.0000	1.670E-07	0.0000	0.000E+00	0.0000	2.952E-03	0.0000	5.671E-04	0.0000
238	1.069E-05	0.0000	2.665E-04	0.0000	0.000E+00	0.0000	8.452E-03	0.0001	1.406E-03	0.0000
39	1.904E-05	0.0000	2.756E-04	0.0000	0.000E+00	0.0000	8.834E-03	0.0001	1.470E-03	0.0000
0	4.972E-02	0.0005	2.702E-05	0.0000	0.000E+00	0.0000	3.648E+00	0.0385	3.043E-01	0.0032
6	1.060E-05	0.0000	5.946E-05	0.0000	0.000E+00	0.0000	1.235E-03	0.0000	2.828E-04	0.0000
1	8.388E+01	0.8845	3.288E-03	0.0000	0.000E+00	0.0000	5.702E+00	0.0601	2.998E+00	0.0316

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

Water Dependent Pathways

o-lide	Water		Fish		Radon		Plant		Meat	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
11	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
13	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
35	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
1	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
37	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
35	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	1.169E-01	0.0012	1.910E-04	0.0000	0.000E+00	0.0000	2.063E-02	0.0002	6.393E-03	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	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
8	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
9	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	1.169E-01	0.0012	1.910E-04	0.0000	0.000E+00	0.0000	2.063E-02	0.0002	6.393E-03	0.0001

1 water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

io-lide	Ground		Inhalation		Radon		Plant		Meat	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
241	2.733E-03	0.0000	2.645E-04	0.0000	0.000E+00	0.0000	8.423E-03	0.0001	7.008E-04	0.0000
243	5.789E-02	0.0006	2.802E-04	0.0000	0.000E+00	0.0000	8.980E-03	0.0001	7.472E-04	0.0000
1	1.125E-16	0.0000	1.977E-14	0.0000	0.000E+00	0.0000	8.681E-11	0.0000	6.640E-10	0.0000
245	3.054E-02	0.0003	3.989E-04	0.0000	0.000E+00	0.0000	1.274E-02	0.0001	4.260E-04	0.0000
30	7.874E+00	0.0876	1.201E-06	0.0000	0.000E+00	0.0000	4.535E-02	0.0005	2.334E-02	0.0003
237	7.119E+01	0.7919	7.114E-06	0.0000	0.000E+00	0.0000	1.714E+00	0.0191	2.402E+00	0.0267
255	4.628E-02	0.0005	1.014E-07	0.0000	0.000E+00	0.0000	3.614E-05	0.0000	4.864E-05	0.0000
	0.000E+00	0.0000	2.541E-22	0.0000	0.000E+00	0.0000	2.442E-20	0.0000	6.935E-20	0.0000
4	1.065E+00	0.0118	4.919E-07	0.0000	0.000E+00	0.0000	3.263E-04	0.0000	1.687E-08	0.0000
3	0.000E+00	0.0000	1.491E-07	0.0000	0.000E+00	0.0000	2.637E-03	0.0000	5.069E-04	0.0000
38	1.056E-05	0.0000	2.616E-04	0.0000	0.000E+00	0.0000	8.297E-03	0.0001	1.381E-03	0.0000
39	1.895E-05	0.0000	2.727E-04	0.0000	0.000E+00	0.0000	8.741E-03	0.0001	1.455E-03	0.0000
0	4.323E-02	0.0005	2.336E-05	0.0000	0.000E+00	0.0000	3.156E+00	0.0351	2.637E-01	0.0029
6	1.029E-05	0.0000	5.734E-05	0.0000	0.000E+00	0.0000	1.192E-03	0.0000	2.728E-04	0.0000
1	8.031E+01	0.8933	1.568E-03	0.0000	0.000E+00	0.0000	4.967E+00	0.0552	2.694E+00	0.0300

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

Water Dependent Pathways

de	Water		Fish		Radon		Plant		Meat	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
1	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
5	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
7	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
5	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	2.465E-03	0.0000	7.597E-06	0.0000	0.000E+00	0.0000	1.328E-03	0.0000	9.969E-04	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
1	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	2.465E-03	0.0000	7.597E-06	0.0000	0.000E+00	0.0000	1.328E-03	0.0000	9.969E-04	0.0000

water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

io-	Ground		Inhalation		Radon		Plant		Meat	
lide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
?41	2.710E-03	0.0000	2.587E-04	0.0000	0.000E+00	0.0000	8.241E-03	0.0001	6.856E-04	0.0000
?43	5.751E-02	0.0007	2.750E-04	0.0000	0.000E+00	0.0000	8.813E-03	0.0001	7.333E-04	0.0000
1	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.695E-30	0.0000	2.826E-29	0.0000
?45	3.034E-02	0.0004	3.921E-04	0.0000	0.000E+00	0.0000	1.252E-02	0.0002	4.216E-04	0.0000
;0	5.983E+00	0.0729	9.043E-07	0.0000	0.000E+00	0.0000	3.414E-02	0.0004	1.757E-02	0.0002
.37	6.664E+01	0.8122	6.592E-06	0.0000	0.000E+00	0.0000	1.588E+00	0.0194	2.225E+00	0.0271
.55	3.466E-02	0.0004	7.494E-08	0.0000	0.000E+00	0.0000	2.672E-05	0.0000	3.596E-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
'4	1.049E+00	0.0128	4.796E-07	0.0000	0.000E+00	0.0000	3.181E-04	0.0000	1.645E-08	0.0000
:3	0.000E+00	0.0000	1.189E-07	0.0000	0.000E+00	0.0000	2.102E-03	0.0000	4.040E-04	0.0000
38	1.031E-05	0.0000	2.521E-04	0.0000	0.000E+00	0.0000	7.995E-03	0.0001	1.330E-03	0.0000
39	1.878E-05	0.0000	2.669E-04	0.0000	0.000E+00	0.0000	8.557E-03	0.0001	1.424E-03	0.0000
0	3.268E-02	0.0004	1.746E-05	0.0000	0.000E+00	0.0000	2.359E+00	0.0288	1.971E-01	0.0024
6	9.701E-06	0.0000	5.333E-05	0.0000	0.000E+00	0.0000	1.108E-03	0.0000	2.537E-04	0.0000
1	7.383E+01	0.8998	1.524E-03	0.0000	0.000E+00	0.0000	4.031E+00	0.0491	2.445E+00	0.0298

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

Water Dependent Pathways

>-	Water		Fish		Radon		Plant		Meat	
ide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
11	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
13	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
5	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
'.	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
7	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
5	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+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
8	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
9	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+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

...l water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

.o-	Ground		Inhalation		Radon		Plant		Meat	
.ide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
:41	2.632E-03	0.0000	2.393E-04	0.0000	0.000E+00	0.0000	7.622E-03	0.0001	6.342E-04	0.0000
:43	5.614E-02	0.0009	2.571E-04	0.0000	0.000E+00	0.0000	8.240E-03	0.0001	6.857E-04	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
45	2.964E-02	0.0005	3.689E-04	0.0000	0.000E+00	0.0000	1.178E-02	0.0002	4.052E-04	0.0000
0	2.285E+00	0.0372	3.342E-07	0.0000	0.000E+00	0.0000	1.262E-02	0.0002	6.495E-03	0.0001
37	5.283E+01	0.8605	5.040E-06	0.0000	0.000E+00	0.0000	1.214E+00	0.0198	1.701E+00	0.0277
55	1.260E-02	0.0002	2.600E-08	0.0000	0.000E+00	0.0000	9.271E-06	0.0000	1.248E-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
4	9.927E-01	0.0162	4.383E-07	0.0000	0.000E+00	0.0000	2.907E-04	0.0000	1.503E-08	0.0000
3	0.000E+00	0.0000	5.364E-08	0.0000	0.000E+00	0.0000	9.484E-04	0.0000	1.823E-04	0.0000
38	9.491E-06	0.0000	2.211E-04	0.0000	0.000E+00	0.0000	7.011E-03	0.0001	1.167E-03	0.0000
39	1.816E-05	0.0000	2.473E-04	0.0000	0.000E+00	0.0000	7.929E-03	0.0001	1.319E-03	0.0000
0	1.227E-02	0.0002	6.296E-06	0.0000	0.000E+00	0.0000	8.506E-01	0.0139	7.107E-02	0.0012
6	7.879E-06	0.0000	4.131E-05	0.0000	0.000E+00	0.0000	8.583E-04	0.0000	1.965E-04	0.0000
1	5.622E+01	0.9157	1.387E-03	0.0000	0.000E+00	0.0000	2.122E+00	0.0346	1.784E+00	0.0291

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

Water Dependent Pathways

)-	Water		Fish		Radon		Plant		Meat	
.de	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
1	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
5	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
7	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
5	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+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
8	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
9	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

1 water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

io-lide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.
241	2.419E-03	0.0001	1.886E-04	0.0000	0.000E+00	0.0000	6.009E-03	0.0002	5.000E-04	0.0000
243	5.207E-02	0.0017	2.090E-04	0.0000	0.000E+00	0.0000	6.698E-03	0.0002	5.577E-04	0.0000
ı	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
245	2.763E-02	0.0009	3.065E-04	0.0000	0.000E+00	0.0000	9.789E-03	0.0003	3.537E-04	0.0000
50	1.445E-01	0.0048	1.917E-08	0.0000	0.000E+00	0.0000	7.238E-04	0.0000	3.725E-04	0.0000
.37	2.694E+01	0.8981	2.306E-06	0.0000	0.000E+00	0.0000	5.556E-01	0.0185	7.785E-01	0.0260
.55	6.965E-04	0.0000	1.245E-09	0.0000	0.000E+00	0.0000	4.439E-07	0.0000	5.974E-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
ı4	8.406E-01	0.0280	3.337E-07	0.0000	0.000E+00	0.0000	2.214E-04	0.0000	1.145E-08	0.0000
:3	0.000E+00	0.0000	5.443E-09	0.0000	0.000E+00	0.0000	9.623E-05	0.0000	1.850E-05	0.0000
38	7.474E-06	0.0000	1.497E-04	0.0000	0.000E+00	0.0000	4.746E-03	0.0002	7.898E-04	0.0000
39	1.642E-05	0.0000	1.960E-04	0.0000	0.000E+00	0.0000	6.283E-03	0.0002	1.045E-03	0.0000
0	7.411E-04	0.0000	3.364E-07	0.0000	0.000E+00	0.0000	4.545E-02	0.0015	3.798E-03	0.0001
6	4.338E-06	0.0000	1.961E-05	0.0000	0.000E+00	0.0000	4.075E-04	0.0000	9.329E-05	0.0000
1	2.801E+01	0.9337	1.072E-03	0.0000	0.000E+00	0.0000	6.360E-01	0.0212	7.860E-01	0.0262

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

Water Dependent Pathways

)-.de	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.
1	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
5	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
7	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
5	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+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
8	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
9	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+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

... water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and
As mrem/yr and Fraction of Total Dose At t = 3.300E+01 years

Water Independent Pathways (Inhalation excludes radon)

:o-.ide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.
:41	2.388E-03	0.0001	1.816E-04	0.0000	0.000E+00	0.0000	5.786E-03	0.0002	4.814E-04	0.0000
:43	5.143E-02	0.0019	2.021E-04	0.0000	0.000E+00	0.0000	6.479E-03	0.0002	5.395E-04	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
45	2.732E-02	0.0010	2.975E-04	0.0000	0.000E+00	0.0000	9.502E-03	0.0004	3.455E-04	0.0000
0	9.537E-02	0.0035	1.246E-08	0.0000	0.000E+00	0.0000	4.703E-04	0.0000	2.421E-04	0.0000
37	2.431E+01	0.8983	2.046E-06	0.0000	0.000E+00	0.0000	4.930E-01	0.0182	6.908E-01	0.0255
55	4.508E-04	0.0000	7.873E-10	0.0000	0.000E+00	0.0000	2.807E-07	0.0000	3.778E-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
4	8.186E-01	0.0302	3.197E-07	0.0000	0.000E+00	0.0000	2.121E-04	0.0000	1.097E-08	0.0000
3	0.000E+00	0.0000	3.853E-09	0.0000	0.000E+00	0.0000	6.812E-05	0.0000	1.310E-05	0.0000
38	7.210E-06	0.0000	1.408E-04	0.0000	0.000E+00	0.0000	4.467E-03	0.0002	7.433E-04	0.0000
39	1.615E-05	0.0000	1.888E-04	0.0000	0.000E+00	0.0000	6.054E-03	0.0002	1.007E-03	0.0000
0	4.858E-04	0.0000	2.163E-07	0.0000	0.000E+00	0.0000	2.923E-02	0.0011	2.442E-03	0.0001
6	3.964E-06	0.0000	1.750E-05	0.0000	0.000E+00	0.0000	3.636E-04	0.0000	8.325E-05	0.0000
1	2.531E+01	0.9351	1.031E-03	0.0000	0.000E+00	0.0000	5.556E-01	0.0205	6.967E-01	0.0257

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and
As mrem/yr and Fraction of Total Dose At t = 3.300E+01 years

Water Dependent Pathways

)-.de	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.
1	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
5	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
7	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
5	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
9	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

1 water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

io-lide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.
241	1.679E-03	0.0007	5.841E-05	0.0000	0.000E+00	0.0000	1.862E-03	0.0007	1.549E-04	0.0001
243	3.256E-02	0.0129	7.204E-05	0.0000	0.000E+00	0.0000	2.310E-03	0.0009	1.927E-04	0.0001
1	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
245	1.794E-02	0.0071	1.145E-04	0.0000	0.000E+00	0.0000	3.658E-03	0.0015	1.480E-04	0.0001
50	7.096E-06	0.0000	6.165E-13	0.0000	0.000E+00	0.0000	2.328E-08	0.0000	1.199E-08	0.0000
137	1.980E+00	0.7866	1.063E-07	0.0000	0.000E+00	0.0000	2.563E-02	0.0102	3.592E-02	0.0143
155	2.370E-08	0.0000	2.128E-14	0.0000	0.000E+00	0.0000	7.590E-12	0.0000	1.022E-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
14	3.636E-01	0.1445	9.157E-08	0.0000	0.000E+00	0.0000	6.077E-05	0.0000	3.144E-09	0.0000
3	0.000E+00	0.0000	1.289E-12	0.0000	0.000E+00	0.0000	2.280E-08	0.0000	4.386E-09	0.0000
38	3.089E-06	0.0000	2.720E-05	0.0000	0.000E+00	0.0000	8.629E-04	0.0003	1.436E-04	0.0001
39	9.602E-06	0.0000	6.179E-05	0.0000	0.000E+00	0.0000	1.982E-03	0.0008	3.298E-04	0.0001
0	3.195E-08	0.0000	8.449E-12	0.0000	0.000E+00	0.0000	1.142E-06	0.0000	9.551E-08	0.0000
6	4.870E-07	0.0000	1.030E-06	0.0000	0.000E+00	0.0000	2.140E-05	0.0000	4.901E-06	0.0000
1	2.395E+00	0.9518	3.352E-04	0.0001	0.000E+00	0.0000	3.639E-02	0.0145	3.690E-02	0.0147

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

Water Dependent Pathways

o-ide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.
11	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
13	1.385E-16	0.0000	3.545E-18	0.0000	0.000E+00	0.0000	7.758E-17	0.0000	3.796E-20	0.0000
	1.383E-04	0.0001	1.185E-02	0.0047	0.000E+00	0.0000	1.065E-03	0.0004	2.514E-04	0.0001
15	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
)	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
37	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
55	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+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
8	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
9	1.065E-12	0.0000	2.729E-14	0.0000	0.000E+00	0.0000	5.974E-13	0.0000	2.938E-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
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	1.383E-04	0.0001	1.185E-02	0.0047	0.000E+00	0.0000	1.065E-03	0.0004	2.514E-04	0.0001

... water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

io- .ide	Ground		Inhalation		Radon		Plant		Meat	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
!41	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
!43	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
45	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
0	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
37	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
55	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
4	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
38	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
39	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
)	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
5	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
l	0.000E+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
As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Dependent Pathways

de	Water		Fish		Radon		Plant		Meat	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
1	3.094E-10	0.0000	5.303E-12	0.0000	0.000E+00	0.0000	1.743E-10	0.0000	1.487E-12	0.0000
3	1.033E-11	0.0000	2.135E-13	0.0000	0.000E+00	0.0000	5.817E-12	0.0000	1.025E-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
5	1.547E-11	0.0000	6.801E-13	0.0000	0.000E+00	0.0000	8.724E-12	0.0000	6.521E-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
7	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
5	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	1.950E-08	0.0015	3.348E-09	0.0003	0.000E+00	0.0000	1.113E-08	0.0009	1.404E-09	0.0001
;	7.662E-06	0.6086	1.325E-07	0.0105	0.000E+00	0.0000	4.318E-06	0.3430	3.698E-08	0.0029
)	5.614E-09	0.0004	1.082E-10	0.0000	0.000E+00	0.0000	3.164E-09	0.0003	6.886E-11	0.0000
	1.252E-10	0.0000	1.291E-11	0.0000	0.000E+00	0.0000	7.538E-11	0.0000	1.459E-11	0.0000
	8.349E-25	0.0000	7.147E-26	0.0000	0.000E+00	0.0000	4.733E-25	0.0000	1.152E-26	0.0000
	7.687E-06	0.6106	1.360E-07	0.0108	0.000E+00	0.0000	4.332E-06	0.3441	3.847E-08	0.0031

water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

io-lide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.
241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
243	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
4	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
245	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
50	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
.55	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
53	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
38	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
39	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
0	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
6	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
1	0.000E+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
As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Dependent Pathways

o-ide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.
11	9.588E-10	0.0155	1.652E-11	0.0003	0.000E+00	0.0000	5.402E-10	0.0087	4.615E-12	0.0001
13	3.725E-11	0.0006	7.403E-13	0.0000	0.000E+00	0.0000	2.099E-11	0.0003	3.683E-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
5	8.417E-10	0.0136	1.489E-11	0.0002	0.000E+00	0.0000	4.742E-10	0.0077	4.042E-12	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
7	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
5	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+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
8	2.759E-08	0.4453	8.372E-09	0.1351	0.000E+00	0.0000	1.558E-08	0.2515	2.730E-10	0.0044
9	2.076E-09	0.0335	3.984E-11	0.0006	0.000E+00	0.0000	1.170E-09	0.0189	2.254E-11	0.0004
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	1.536E-09	0.0248	1.322E-10	0.0021	0.000E+00	0.0000	8.739E-10	0.0141	2.163E-11	0.0003
	3.304E-08	0.5333	8.576E-09	0.1384	0.000E+00	0.0000	1.866E-08	0.3012	3.262E-10	0.0053

l water independent and dependent pathways.

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

.)	Product (j)	Branch Fraction*	DSR(j,t) (mrem/yr)/(pCi/g) t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	3.300E+01	1.000E+02
241	Am-241	1.000E+00	1.330E-01	1.317E-01	1.291E-01	1.202E-01	9.707E-02	9.385E-02	3.625E-02
241	Np-237	1.000E+00	3.074E-07	9.349E-07	2.140E-06	5.813E-06	1.244E-05	1.304E-05	1.091E-05
241	U-233	1.000E+00	8.620E-15	5.176E-14	2.392E-13	1.607E-12	6.790E-12	7.425E-12	7.640E-12
241	Th-229	1.000E+00	4.327E-18	6.222E-17	6.865E-16	1.532E-14	2.380E-13	2.956E-13	1.916E-12
241	∑DSR(j)		1.330E-01	1.317E-01	1.291E-01	1.202E-01	9.708E-02	9.386E-02	3.627E-02
243	Am-243	1.000E+00	4.775E-01	4.752E-01	4.707E-01	4.549E-01	4.099E-01	4.032E-01	2.326E-01
243	Pu-239	1.000E+00	1.663E-06	4.957E-06	1.135E-05	3.170E-05	7.392E-05	7.838E-05	8.039E-05
243	U-235	1.000E+00	1.531E-15	1.048E-14	5.256E-14	3.917E-13	2.066E-12	2.336E-12	5.621E-12
243	Pa-231	1.000E+00	6.937E-20	1.077E-18	1.196E-17	2.389E-16	2.589E-15	3.051E-15	7.008E-15
243	Ac-227	1.000E+00	3.467E-22	8.726E-21	1.730E-19	7.721E-18	1.550E-16	1.907E-16	2.097E-15
243	∑DSR(j)		4.775E-01	4.753E-01	4.707E-01	4.549E-01	4.100E-01	4.032E-01	2.327E-01
	C-14	1.000E+00	1.854E-01	4.198E-10	1.787E-29	0.000E+00	0.000E+00	0.000E+00	6.432E-03
245	Cm-245	1.000E+00	2.543E-01	2.527E-01	2.497E-01	2.391E-01	2.099E-01	2.056E-01	1.089E-01
45	Pu-241	1.000E+00	5.293E-05	1.546E-04	3.382E-04	8.066E-04	1.260E-03	1.266E-03	5.516E-04
45	Am-241	1.000E+00	1.696E-06	1.159E-05	5.825E-05	4.383E-04	2.300E-03	2.590E-03	4.954E-03
45	Np-237	1.000E+00	1.858E-12	2.874E-11	3.286E-10	7.505E-09	1.163E-07	1.439E-07	7.511E-07
45	U-233	1.000E+00	3.697E-20	9.601E-19	2.049E-17	1.174E-15	4.094E-14	5.379E-14	4.299E-13
45	Th-229	1.000E+00	1.138E-23	6.766E-22	3.391E-20	6.440E-18	7.995E-16	1.187E-15	5.529E-14
45	∑DSR(j)		2.543E-01	2.529E-01	2.501E-01	2.403E-01	2.134E-01	2.094E-01	1.144E-01
45	Cm-245	2.450E-05	6.230E-06	6.192E-06	6.117E-06	5.858E-06	5.142E-06	5.037E-06	2.668E-06
45	Pu-241	2.450E-05	1.297E-09	3.789E-09	8.285E-09	1.976E-08	3.087E-08	3.102E-08	1.352E-08
45	Np-237	2.450E-05	1.161E-13	8.260E-13	4.207E-12	3.126E-11	1.536E-10	1.711E-10	2.450E-10
45	U-233	2.450E-05	2.679E-21	3.384E-20	3.353E-19	6.333E-18	6.837E-17	8.052E-17	1.627E-16
45	Th-229	2.450E-05	1.027E-24	3.017E-23	7.094E-22	4.480E-20	1.791E-18	2.400E-18	3.189E-17
45	∑DSR(j)		6.231E-06	6.196E-06	6.125E-06	5.877E-06	5.173E-06	5.068E-06	2.682E-06
)	Co-60	1.000E+00	5.429E+00	4.732E+00	3.595E+00	1.373E+00	6.675E-02	5.724E-02	4.247E-06
37	Cs-137	1.000E+00	1.360E+00	1.315E+00	1.230E+00	9.727E-01	4.924E-01	4.439E-01	3.531E-02
5	Eu-155	1.000E+00	7.052E-02	6.103E-02	4.571E-02	1.661E-02	9.180E-04	5.942E-04	3.121E-08
	H-3	1.000E+00	7.743E-03	2.624E-04	1.076E-40	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	Nb-94	1.000E+00	3.577E+00	3.550E+00	3.496E+00	3.310E+00	2.803E+00	2.729E+00	1.212E+00
	Ni-63	1.000E+00	1.342E-03	1.199E-03	9.553E-04	4.311E-04	4.374E-05	3.097E-05	1.037E-08
3	Pu-238	1.000E+00	1.045E-01	1.026E-01	9.884E-02	8.668E-02	5.868E-02	5.523E-02	1.068E-02
3	U-234	1.000E+00	3.815E-08	1.110E-07	2.366E-07	5.107E-07	6.151E-07	5.965E-07	1.326E-07
3	Th-230	1.000E+00	8.916E-14	5.781E-13	2.794E-12	1.955E-11	8.795E-11	9.707E-11	1.258E-10
3	Ra-226	1.000E+00	2.197E-15	3.230E-14	3.531E-13	7.290E-12	8.933E-11	1.071E-10	3.494E-10
	Pb-210	1.000E+00	5.548E-18	1.467E-16	3.122E-15	1.671E-13	4.649E-12	5.908E-12	2.501E-11
	∑DSR(j)		1.045E-01	1.026E-01	9.884E-02	8.668E-02	5.868E-02	5.523E-02	1.068E-02

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

.)	Product (j)	Branch Fraction*	t= 0.000E+00	1.000E+00	3.000E+00	DSR(j,t) 1.000E+01	(mrem/yr)/(pCi/g) 3.000E+01	3.300E+01	1.000E+02
239	Pu-239	1.000E+00	1.161E-01	1.148E-01	1.124E-01	1.042E-01	8.256E-02	7.955E-02	2.606E-02
239	U-235	1.000E+00	1.587E-10	4.601E-10	9.945E-10	2.299E-09	3.483E-09	3.508E-09	2.140E-09
239	Pa-231	1.000E+00	9.912E-15	7.006E-14	3.405E-13	2.099E-12	6.288E-12	6.547E-12	3.199E-12
239	Ac-227	1.000E+00	5.673E-17	6.872E-16	6.184E-15	8.455E-14	4.426E-13	4.778E-13	1.093E-11
239	∑DSR(j)		1.161E-01	1.148E-01	1.124E-01	1.042E-01	8.256E-02	7.955E-02	2.606E-02
90	Sr-90	1.000E+00	7.766E-01	6.721E-01	5.024E-01	1.813E-01	9.702E-03	6.240E-03	2.462E-07
36	U-236	1.000E+00	2.644E-02	2.551E-02	2.372E-02	1.838E-02	8.730E-03	7.791E-03	4.606E-04
36	Th-232	1.000E+00	2.471E-12	7.028E-12	1.552E-11	3.988E-11	7.592E-11	7.830E-11	5.022E-11
36	Ra-228	1.000E+00	2.974E-12	1.994E-11	9.313E-11	5.432E-10	1.716E-09	1.828E-09	1.821E-09
36	Th-228	1.000E+00	2.935E-13	3.880E-12	3.491E-11	4.067E-10	1.801E-09	1.951E-09	2.225E-09
36	∑DSR(j)		2.644E-02	2.551E-02	2.372E-02	1.838E-02	8.730E-03	7.791E-03	4.606E-04

unch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j)
DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

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

ide	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	3.300E+01	1.000E+02	3.
41	1.880E+02	1.898E+02	1.937E+02	2.079E+02	2.575E+02	2.663E+02	6.894E+02	7.
43	5.235E+01	5.260E+01	5.311E+01	5.496E+01	6.097E+01	6.200E+01	1.074E+02	*1.
	1.348E+02	5.955E+10	*4.454E+12	*4.454E+12	*4.454E+12	*4.454E+12	3.887E+03	*4.
45	9.830E+01	9.885E+01	9.997E+01	1.040E+02	1.171E+02	1.194E+02	2.185E+02	*1.
)	4.605E+00	5.283E+00	6.954E+00	1.821E+01	2.882E+02	4.368E+02	5.887E+06	*1.
37	1.838E+01	1.901E+01	2.032E+01	2.570E+01	5.077E+01	5.632E+01	7.080E+02	*6.
35	3.545E+02	4.096E+02	5.470E+02	1.505E+03	2.723E+04	4.207E+04	8.011E+08	*4.
	3.229E+03	9.528E+04	*9.594E+15	*9.594E+15	*9.594E+15	*9.594E+15	*9.594E+15	*9.
1	6.988E+00	7.042E+00	7.151E+00	7.553E+00	8.920E+00	9.159E+00	2.062E+01	*1.
1	1.863E+04	2.086E+04	2.617E+04	5.799E+04	5.715E+05	8.073E+05	2.412E+09	2.
18	2.393E+02	2.437E+02	2.529E+02	2.884E+02	4.260E+02	4.527E+02	2.341E+03	3.
19	2.154E+02	2.177E+02	2.224E+02	2.400E+02	3.028E+02	3.142E+02	9.591E+02	4.
	3.219E+01	3.720E+01	4.976E+01	1.379E+02	2.577E+03	4.006E+03	1.015E+08	5.
	9.454E+02	9.801E+02	1.054E+03	1.360E+03	2.864E+03	3.209E+03	5.427E+04	*6.

pecific 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
at tmax = time of maximum total dose = 0.000E+00 years

lide i)	Initial (pCi/g)	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
241	1.500E-01	0.000E+00	1.330E-01	1.880E+02	1.330E-01	1.880E+02
243	1.600E-01	0.000E+00	4.775E-01	5.235E+01	4.775E-01	5.235E+01
4	2.110E+00	0.000E+00	1.854E-01	1.348E+02	1.854E-01	1.348E+02
245	2.200E-01	0.000E+00	2.543E-01	9.830E+01	2.543E-01	9.830E+01
50	1.680E+00	0.000E+00	5.429E+00	4.605E+00	5.429E+00	4.605E+00
.37	5.850E+01	0.000E+00	1.360E+00	1.838E+01	1.360E+00	1.838E+01
.55	7.600E-01	0.000E+00	7.052E-02	3.545E+02	7.052E-02	3.545E+02
	2.268E+01	0.000E+00	7.743E-03	3.229E+03	7.743E-03	3.229E+03
14	3.000E-01	0.000E+00	3.577E+00	6.988E+00	3.577E+00	6.988E+00
13	6.960E+00	0.000E+00	1.342E-03	1.863E+04	1.342E-03	1.863E+04
38	1.700E-01	0.000E+00	1.045E-01	2.393E+02	1.045E-01	2.393E+02
39	1.600E-01	0.000E+00	1.161E-01	2.154E+02	1.161E-01	2.154E+02
0	5.490E+00	0.000E+00	7.766E-01	3.219E+01	7.766E-01	3.219E+01
6	1.200E-01	648 ± 1	2.335E-01	1.071E+02	2.644E-02	9.454E+02

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

j)	Parent (i)	BRF(i)	DOSE(j,t), mrem/yr t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	3.300E+01	1.000E+02
241	Am-241	1.000E+00	1.995E-02	1.975E-02	1.936E-02	1.803E-02	1.456E-02	1.408E-02	5.438E-03
241	Cm-245	1.000E+00	3.732E-07	2.549E-06	1.282E-05	9.642E-05	5.061E-04	5.698E-04	1.090E-03
241	∑DOSE(j)		1.995E-02	1.976E-02	1.938E-02	1.813E-02	1.507E-02	1.465E-02	6.528E-03
237	Am-241	1.000E+00	4.611E-08	1.402E-07	3.209E-07	8.719E-07	1.867E-06	1.956E-06	1.636E-06
237	Cm-245	1.000E+00	4.088E-13	6.322E-12	7.228E-11	1.651E-09	2.559E-08	3.167E-08	1.652E-07
237	Cm-245	2.450E-05	2.555E-14	1.817E-13	9.256E-13	6.878E-12	3.380E-11	3.765E-11	5.390E-11
237	∑DOSE(j)		4.611E-08	1.402E-07	3.210E-07	8.736E-07	1.892E-06	1.987E-06	1.801E-06
13	Am-241	1.000E+00	1.293E-15	7.764E-15	3.588E-14	2.410E-13	1.019E-12	1.114E-12	1.146E-12
13	Cm-245	1.000E+00	8.134E-21	2.112E-19	4.509E-18	2.584E-16	9.007E-15	1.183E-14	9.457E-14
13	Cm-245	2.450E-05	5.894E-22	7.444E-21	7.376E-20	1.393E-18	1.504E-17	1.771E-17	3.578E-17
13	∑DOSE(j)		1.293E-15	7.765E-15	3.588E-14	2.413E-13	1.028E-12	1.126E-12	1.241E-12
29	Am-241	1.000E+00	6.491E-19	9.333E-18	1.030E-16	2.298E-15	3.570E-14	4.434E-14	2.874E-13
29	Cm-245	1.000E+00	2.504E-24	1.488E-22	7.460E-21	1.417E-18	1.759E-16	2.612E-16	1.216E-14
29	Cm-245	2.450E-05	2.260E-25	6.638E-24	1.561E-22	9.856E-21	3.941E-19	5.279E-19	7.017E-18
29	∑DOSE(j)		6.491E-19	9.334E-18	1.030E-16	2.299E-15	3.588E-14	4.460E-14	2.996E-13
43	Am-243	1.000E+00	7.640E-02	7.604E-02	7.531E-02	7.278E-02	6.559E-02	6.451E-02	3.721E-02
[illegible]	Am-243	1.000E+00	2.661E-07	7.931E-07	1.816E-06	5.073E-06	1.183E-05	1.254E-05	1.286E-05
[illegible]	u-239	1.000E+00	1.857E-02	1.838E-02	1.799E-02	1.667E-02	1.321E-02	1.273E-02	4.170E-03
39	∑DOSE(j)		1.857E-02	1.838E-02	1.799E-02	1.667E-02	1.322E-02	1.274E-02	4.183E-03
5	Am-243	1.000E+00	2.449E-16	1.677E-15	8.410E-15	6.267E-14	3.305E-13	3.738E-13	8.993E-13
5	Pu-239	1.000E+00	2.539E-11	7.362E-11	1.591E-10	3.678E-10	5.573E-10	5.613E-10	3.423E-10
5	∑DOSE(j)		2.539E-11	7.362E-11	1.591E-10	3.679E-10	5.577E-10	5.617E-10	3.432E-10
41	Am-243	1.000E+00	1.110E-20	1.724E-19	1.914E-18	3.823E-17	4.142E-16	4.882E-16	1.121E-15
41	Pu-239	1.000E+00	1.586E-15	1.121E-14	5.448E-14	3.359E-13	1.006E-12	1.048E-12	5.118E-13
41	∑DOSE(j)		1.586E-15	1.121E-14	5.448E-14	3.359E-13	1.006E-12	1.048E-12	5.130E-13
7	Am-243	1.000E+00	5.548E-23	1.396E-21	2.768E-20	1.235E-18	2.480E-17	3.052E-17	3.355E-16
7	Pu-239	1.000E+00	9.078E-18	1.100E-16	9.895E-16	1.353E-14	7.081E-14	7.645E-14	1.748E-12
7	∑DOSE(j)		9.078E-18	1.100E-16	9.895E-16	1.353E-14	7.084E-14	7.648E-14	1.748E-12
	C-14	1.000E+00	3.912E-01	8.858E-10	3.770E-29	0.000E+00	0.000E+00	0.000E+00	1.357E-02
5	Cm-245	1.000E+00	5.594E-02	5.560E-02	5.493E-02	5.260E-02	4.617E-02	4.523E-02	2.396E-02
5	Cm-245	2.450E-05	1.371E-06	1.362E-06	1.346E-06	1.289E-06	1.131E-06	1.108E-06	5.870E-07
5	∑DOSE(j)		5.594E-02	5.560E-02	5.493E-02	5.260E-02	4.617E-02	4.523E-02	2.396E-02
	Cm-245	1.000E+00	1.164E-05	3.402E-05	7.440E-05	1.774E-04	2.772E-04	2.786E-04	1.214E-04
	Cm-245	2.450E-05	2.853E-10	8.336E-10	1.823E-09	4.347E-09	6.791E-09	6.825E-09	2.973E-09
[illegible]	60	1.000E+00	9.120E+00	7.950E+00	6.040E+00	2.306E+00	1.457E-01	9.616E-02	7.134E-06
	Cs-137	1.000E+00	7.956E+01	7.695E+01	7.197E+01	5.690E+01	2.880E+01	2.597E+01	2.066E+00

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

j)	Parent (i)	BRF(i)	DOSE(j,t), mrem/yr						
		t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	3.300E+01	1.000E+02
155	Eu-155	1.000E+00	5.360E-02	4.638E-02	3.474E-02	1.263E-02	6.977E-04	4.516E-04	2.372E-08
	H-3	1.000E+00	1.756E-01	5.951E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
94	Nb-94	1.000E+00	1.073E+00	1.065E+00	1.049E+00	9.930E-01	8.408E-01	8.188E-01	3.637E-01
63	Ni-63	1.000E+00	9.338E-03	8.342E-03	6.649E-03	3.001E-03	3.044E-04	2.155E-04	7.214E-08
238	Pu-238	1.000E+00	1.776E-02	1.744E-02	1.680E-02	1.473E-02	9.976E-03	9.389E-03	1.815E-03
14	Pu-238	1.000E+00	6.486E-09	1.888E-08	4.021E-08	8.682E-08	1.046E-07	1.014E-07	2.253E-08
230	Pu-238	1.000E+00	1.516E-14	9.828E-14	4.750E-13	3.323E-12	1.495E-11	1.650E-11	2.139E-11
226	Pu-238	1.000E+00	3.735E-16	5.491E-15	6.002E-14	1.239E-12	1.519E-11	1.821E-11	5.939E-11
210	Pu-238	1.000E+00	9.431E-19	2.493E-17	5.308E-16	2.840E-14	7.903E-13	1.004E-12	4.252E-12
0	Sr-90	1.000E+00	4.264E+00	3.690E+00	2.758E+00	9.951E-01	5.326E-02	3.426E-02	1.352E-06
6	U-236	1.000E+00	3.173E-03	3.061E-03	2.847E-03	2.205E-03	1.048E-03	9.349E-04	5.527E-05
[redacted]	-236	1.000E+00	2.965E-13	8.433E-13	1.863E-12	4.786E-12	9.111E-12	9.396E-12	6.027E-12
228	U-236	1.000E+00	3.569E-13	2.393E-12	1.118E-11	6.518E-11	2.059E-10	2.194E-10	2.185E-10
228	U-236	1.000E+00	3.522E-14	4.657E-13	4.189E-12	4.880E-11	2.161E-10	2.341E-10	2.670E-10

i) is the branch fraction of the parent nuclide.

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

j)	Parent (i)	BRF(i)	S(j,t), pCi/g t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	3.300E+01	1.000E+02
241	Am-241	1.000E+00	1.500E-01	1.494E-01	1.481E-01	1.439E-01	1.324E-01	1.308E-01	9.896E-02
241	Cm-245	1.000E+00	0.000E+00	8.327E-06	7.209E-05	7.022E-04	4.479E-03	5.166E-03	1.970E-02
241	∑S(j):		1.500E-01	1.494E-01	1.482E-01	1.446E-01	1.369E-01	1.359E-01	1.187E-01
237	Am-241	1.000E+00	0.000E+00	4.814E-08	1.418E-07	4.431E-07	1.109E-06	1.187E-06	2.011E-06
237	Cm-245	1.000E+00	0.000E+00	9.002E-13	2.344E-11	7.663E-10	1.478E-08	1.874E-08	2.016E-07
237	Cm-245	2.450E-05	0.000E+00	4.106E-14	3.531E-13	3.356E-12	1.986E-11	2.265E-11	6.615E-11
237	∑S(j):		0.000E+00	4.814E-08	1.418E-07	4.439E-07	1.124E-06	1.206E-06	2.213E-06
33	Am-241	1.000E+00	0.000E+00	1.030E-13	8.729E-13	7.903E-12	4.190E-11	4.713E-11	1.143E-10
33	Cm-245	1.000E+00	0.000E+00	9.734E-19	7.438E-17	7.521E-15	3.563E-13	4.833E-13	9.334E-12
33	Cm-245	2.450E-05	0.000E+00	5.911E-20	1.487E-18	4.321E-17	6.089E-16	7.390E-16	3.560E-15
33	∑S(j):		0.000E+00	1.030E-13	8.729E-13	7.911E-12	4.226E-11	4.761E-11	1.236E-10
29	Am-241	1.000E+00	0.000E+00	3.268E-18	8.432E-17	2.678E-15	4.851E-14	6.110E-14	6.181E-13
29	Cm-245	1.000E+00	0.000E+00	1.847E-23	4.276E-21	1.490E-18	2.314E-16	3.496E-16	2.594E-14
29	Cm-245	2.450E-05	0.000E+00	1.405E-24	1.076E-22	1.094E-20	5.281E-19	7.186E-19	1.505E-17
29	∑S(j):		0.000E+00	3.268E-18	8.432E-17	2.679E-15	4.874E-14	6.145E-14	6.440E-13
43	Am-243	1.000E+00	1.600E-01	1.596E-01	1.587E-01	1.558E-01	1.478E-01	1.466E-01	1.228E-01
39	Am-243	1.000E+00	0.000E+00	4.593E-06	1.369E-05	4.460E-05	1.253E-04	1.365E-04	3.324E-04
39	Pu-239	1.000E+00	1.600E-01	1.594E-01	1.581E-01	1.539E-01	1.423E-01	1.407E-01	1.083E-01
39	∑S(j):		1.600E-01	1.594E-01	1.582E-01	1.539E-01	1.425E-01	1.408E-01	1.087E-01
5	Am-243	1.000E+00	0.000E+00	2.210E-15	1.887E-14	1.760E-13	1.024E-12	1.168E-12	3.990E-12
5	Pu-239	1.000E+00	0.000E+00	1.516E-10	4.216E-10	1.091E-09	1.762E-09	1.787E-09	1.528E-09
5	∑S(j):		0.000E+00	1.516E-10	4.216E-10	1.091E-09	1.763E-09	1.789E-09	1.532E-09
31	Am-243	1.000E+00	0.000E+00	1.540E-20	3.855E-19	1.103E-17	1.521E-16	1.845E-16	1.002E-15
31	Pu-239	1.000E+00	0.000E+00	1.585E-15	1.291E-14	1.021E-13	3.769E-13	4.033E-13	4.604E-13
31	∑S(j):		0.000E+00	1.585E-15	1.291E-14	1.021E-13	3.771E-13	4.035E-13	4.614E-13
7	Am-243	1.000E+00	0.000E+00	1.184E-22	8.305E-21	6.379E-19	1.629E-17	2.049E-17	1.407E-16
7	Pu-239	1.000E+00	0.000E+00	1.615E-17	3.647E-16	7.482E-15	4.781E-14	5.263E-14	6.912E-14
7	∑S(j):		0.000E+00	1.615E-17	3.648E-16	7.482E-15	4.782E-14	5.266E-14	6.927E-14
	C-14	1.000E+00	2.110E+00	4.383E-10	1.891E-29	0.000E+00	0.000E+00	0.000E+00	0.000E+00
5	Cm-245	1.000E+00	2.200E-01	2.194E-01	2.182E-01	2.140E-01	2.025E-01	2.008E-01	1.669E-01
5	Cm-245	2.450E-05	5.390E-06	5.375E-06	5.346E-06	5.243E-06	4.962E-06	4.921E-06	4.090E-06
5	∑S(j):		2.200E-01	2.194E-01	2.182E-01	2.140E-01	2.025E-01	2.008E-01	1.669E-01
1	Cm-245	1.000E+00	0.000E+00	1.030E-02	2.929E-02	8.135E-02	1.528E-01	1.577E-01	1.620E-01
1	Cm-245	2.450E-05	0.000E+00	2.525E-07	7.176E-07	1.993E-06	3.743E-06	3.863E-06	3.968E-06
	-60	1.000E+00	1.680E+00	1.468E+00	1.120E+00	4.347E-01	2.910E-02	1.940E-02	2.259E-06
	Cs-137	1.000E+00	5.850E+01	5.669E+01	5.325E+01	4.275E+01	2.283E+01	2.078E+01	2.541E+00

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

j)	Parent (i)	BRF(i)	S(j,t), pCi/g						
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	3.300E+01	1.000E+02
155	Eu-155	1.000E+00	7.600E-01	6.579E-01	4.931E-01	1.797E-01	1.004E-02	6.514E-03	4.143E-07
	H-3	1.000E+00	2.268E+01	3.622E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
94	Nb-94	1.000E+00	3.000E-01	2.982E-01	2.948E-01	2.829E-01	2.515E-01	2.471E-01	1.666E-01
63	Ni-63	1.000E+00	6.960E+00	6.256E+00	5.054E+00	2.395E+00	2.837E-01	2.060E-01	1.622E-04
238	Pu-238	1.000E+00	1.700E-01	1.680E-01	1.641E-01	1.511E-01	1.194E-01	1.153E-01	5.240E-02
34	Pu-238	1.000E+00	0.000E+00	4.619E-07	1.274E-06	3.194E-06	4.616E-06	4.596E-06	2.395E-06
230	Pu-238	1.000E+00	0.000E+00	2.109E-12	1.794E-11	1.652E-10	9.238E-10	1.048E-09	3.158E-09
226	Pu-238	1.000E+00	0.000E+00	3.026E-16	7.629E-15	2.235E-13	3.237E-12	3.947E-12	2.172E-11
210	Pu-238	1.000E+00	0.000E+00	2.336E-18	1.743E-16	1.623E-14	6.114E-13	8.023E-13	8.308E-12
90	Sr-90	1.000E+00	5.490E+00	4.779E+00	3.621E+00	1.371E+00	8.553E-02	5.641E-02	5.185E-06
6	U-236	1.000E+00	1.200E-01	1.165E-01	1.098E-01	8.934E-02	4.951E-02	4.532E-02	6.276E-03
	I-236	1.000E+00	0.000E+00	5.833E-12	1.700E-11	5.125E-11	1.177E-10	1.247E-10	1.893E-10
28	U-236	1.000E+00	0.000E+00	3.337E-13	2.639E-12	1.940E-11	7.029E-11	7.609E-11	1.303E-10
28	U-236	1.000E+00	0.000E+00	3.749E-14	7.754E-13	1.264E-11	6.428E-11	7.054E-11	1.295E-10

i) is the branch fraction of the parent nuclide.

ALC.EXE execution time = 143.53 seconds

Final Status Survey Plan
for the
Plum Brook Reactor Facility

Attachment A
Radionuclide Distribution Basis for DCGL Determination, and Final Status Survey of the Plum Brook Reactor Facility (PBRF)

Addendum 6
Results of Isotopic Analysis of Concrete Core Samples

	Rx Bldg -25ft, Area 22 Core Location #5 C9000101IFL1C1L0505-01				CTMT -25 ft, Canal E Core Location #6 C9000101IFL1C3L0506-01				Rx Bldg -15 ft, SE Area Core Location #7 C9000101IFL1C1L0507-01			
	Result pCi/gm	MDC pCi/gm	Used pCi/gm	Disribution %	Result pCi/gm	MDC pCi/gm	Used pCi/gm	Disribution %	Result pCi/gm	MDC pCi/gm	Used pCi/gm	Disribution %
H-3	4.90E+00	5.20E+00	5.20E+00	2.60%	6.40E+00	5.10E+00	6.40E+00	4.07%	3.00E+00	5.20E+00	5.20E+00	15.33%
Cs-137	2.86E+00	1.70E-01	2.86E+00	1.43%	1.17E+02	2.00E-01	1.17E+02	74.32%	7.20E-01	1.10E-01	7.20E-01	2.12%
Co-60	1.13E+01	1.00E-01	1.13E+01	5.65%	2.21E+00	1.20E-01	2.21E+00	1.40%	1.40E-01	2.40E-01	2.40E-01	0.71%
Fe-55	1.70E+01	6.70E+01	6.70E+01	33.48%	1.80E+00	1.20E+01	1.20E+01	7.62%	4.40E-01	1.30E+01	1.30E+01	38.33%
Ni-63	1.07E+02	2.70E+01	1.07E+02	53.47%	1.19E+01	1.30E+01	1.30E+01	8.26%	8.30E+00	9.80E+00	9.80E+00	28.89%
Sr-90	2.07E+00	6.40E-01	2.07E+00	1.03%	4.60E-01	4.40E-01	4.60E-01	0.29%	4.00E-02	5.70E-01	5.70E-01	1.68%
Pu-238	4.10E-02	6.90E-02	6.90E-02	0.03%	8.50E-02	2.90E-02	8.50E-02	0.05%	6.00E-03	5.30E-02	5.30E-02	0.16%
Pu-239/240	2.70E-02	5.40E-02	5.40E-02	0.03%	1.90E-02	4.70E-02	4.70E-02	0.03%	1.00E-02	2.80E-02	2.80E-02	0.08%
Pu-241	6.00E-01	2.60E+00	2.60E+00	1.30%	1.20E+00	2.80E+00	2.80E+00	1.78%	-2.00E-01	2.50E+00	2.50E+00	7.37%
Am-241	6.00E-02	2.10E-01	2.10E-01	0.10%	1.67E+00	3.00E-01	1.67E+00	1.06%	0.00E+00	1.00E-01	1.00E-01	0.29%
Cm-245/246	5.00E-02	3.90E-01	3.90E-01	0.19%	1.60E-02	8.70E-02	8.70E-02	0.06%	1.00E-01	1.30E-01	1.30E-01	0.38%
U-234	6.40E-01	9.00E-02	6.40E-01	0.32%	7.50E-01	3.00E-02	7.50E-01	0.48%	7.20E-01	4.00E-02	7.20E-01	2.12%
U-235	1.10E-01	7.70E-02	1.10E-01	0.05%	1.30E-02	3.40E-02	3.40E-02	0.02%	2.90E-02	7.70E-02	7.70E-02	0.23%
U-238	6.20E-01	4.00E-02	6.20E-01	0.31%	8.80E-01	3.00E-02	8.80E-01	0.56%	7.80E-01	6.00E-02	7.80E-01	2.30%
			2.00E+02	100%			1.57E+02	100%			3.39E+01	100%

	CTMT -25 ft, Area 18 Core Location #9 C9000101IFL1C3L0509-01				Waste Handling Bldg -15 ft Core Location #10 C9000101IFL1C3L0507-01				Hot Pipe Tunnel, -12 ft Core Location #15 C9000101IFL1C1L0515-01			
	Result pCi/gm	MDC pCi/gm	Used pCi/gm	Disribution %	Result pCi/gm	MDC pCi/gm	Used pCi/gm	Disribution %	Result pCi/gm	MDC pCi/gm	Used pCi/gm	Disribution %
H-3	1.11E+01	5.10E+00	1.11E+01	28.99%	2.70E+00	5.30E+00	5.30E+00	0.17%	1.60E+00	5.30E+00	5.30E+00	0.09%
Cs-137	6.10E-01	8.00E-02	6.10E-01	1.59%	3.15E+03	8.00E-01	3.15E+03	98.90%	4.43E+03	1.00E+00	4.43E+03	76.87%
Co-60	2.32E-01	2.10E-01	2.32E-01	0.61%	-3.30E-02	1.10E-01	1.10E-01	0.00%	2.69E+01	3.00E-01	2.69E+01	0.47%
Fe-55	3.10E+00	1.30E+01	1.30E+01	33.96%	3.30E+00	1.40E+01	1.40E+01	0.44%	1.90E+01	1.70E+01	1.90E+01	0.33%
Ni-63	-4.10E+00	1.10E+01	1.10E+01	28.73%	-1.00E+00	1.00E+01	1.00E+01	0.31%	1.61E+02	2.00E+01	1.61E+02	2.79%
Sr-90	-3.00E-01	4.50E-01	4.50E-01	1.18%	1.20E+00	4.80E-02	1.20E+00	0.04%	1.01E+03	1.00E+00	1.01E+03	17.52%
Pu-238	0.00E+00	0.00E+00	0.00E+00	0.00%	1.90E-02	4.80E-02	4.80E-02	0.00%	6.59E+00	5.00E-02	6.59E+00	0.11%
Pu-239/240	0.00E+00	6.00E-02	6.00E-02	0.16%	1.10E-02	3.00E-02	3.00E-02	0.00%	7.58E+00	3.00E-02	7.58E+00	0.13%
Pu-241	-2.00E-02	3.00E-02	3.00E-02	0.08%	-5.00E-01	2.90E+00	2.90E+00	0.09%	7.47E+01	2.70E+00	7.47E+01	1.30%
Am-241	0.00E+00	2.00E-01	2.00E-01	0.52%	6.00E-03	1.00E-01	1.00E-01	0.00%	1.30E+01	3.00E-01	1.30E+01	0.23%
Cm-245/246	1.55E-01	9.40E-02	1.55E-01	0.40%	4.40E-02	8.70E-02	8.70E-02	0.00%	6.95E+00	1.60E-01	6.95E+00	0.12%
U-234	7.00E-01	4.00E-02	7.00E-01	1.83%	5.50E-01	8.00E-02	5.50E-01	0.02%	1.28E+00	7.00E-02	1.28E+00	0.02%
U-235	1.70E-02	4.70E-02	4.70E-02	0.12%	5.30E-02	4.80E-02	5.30E-02	0.00%	9.00E-02	9.10E-02	9.10E-02	0.00%
U-238	7.00E-01	4.00E-02	7.00E-01	1.83%	5.00E-01	4.00E-02	5.00E-01	0.02%	9.10E-01	7.00E-02	9.10E-01	0.02%
			3.83E+01	100%			3.18E+03	100%			5.76E+03	100%

	Hot Pipe Tunnel, -12 ft Core Location #16 C9000101IFL1C1L0516-01				Fan House -12 ft Core Location #17 C9000101IFL1C1L0517-01			
	Result pCi/gm	MDC pCi/gm	Used pCi/gm	Disribution %	Result pCi/gm	MDC pCi/gm	Used pCi/gm	Disribution %
H-3	2.10E+00	5.20E+00	5.20E+00	0.44%	6.20E+00	5.30E+00	6.20E+00	15.99%
Cs-137	2.60E+02	4.00E-01	2.60E+02	22.04%	4.10E-01	9.00E-02	4.10E-01	1.06%
Co-60	8.97E+00	2.40E-01	8.97E+00	0.76%	-2.70E-02	1.10E-01	1.10E-01	0.28%
Fe-55	8.20E+00	1.40E+01	1.40E+01	1.19%	-2.40E+00	1.40E+01	1.40E+01	36.11%
Ni-63	5.00E+01	2.50E+01	5.00E+01	4.24%	-3.00E+00	1.20E+01	1.20E+01	30.95%
Sr-90	8.36E+02	2.00E+00	8.36E+02	70.87%	0.00E+00	5.00E-01	5.00E-01	1.29%
Pu-238	1.70E-02	5.60E-01	5.60E-01	0.05%	6.00E-03	5.90E-02	5.90E-02	0.15%
Pu-239/240	7.30E-02	5.80E-02	7.30E-02	0.01%	1.10E-02	3.10E-02	3.10E-02	0.08%
Pu-241	1.90E+00	2.70E+00	2.70E+00	0.23%	9.00E-01	3.00E+00	3.00E+00	7.74%
Am-241	4.60E-02	6.70E-02	6.70E-02	0.01%	9.00E-03	5.30E-02	5.30E-02	0.14%
Cm-245/246	0.00E+00	1.00E-01	1.00E-01	0.01%	1.20E-01	1.40E-01	1.40E-01	0.36%
U-234	9.10E-01	6.00E-02	9.10E-01	0.08%	1.14E+00	4.00E-02	1.14E+00	2.94%
U-235	6.50E-02	9.30E-02	9.30E-02	0.01%	5.80E-02	1.10E-01	1.10E-01	0.28%
U-238	9.10E-01	6.00E-02	9.10E-01	0.08%	1.02E+00	4.00E-02	1.02E+00	2.63%
			1.18E+03	100%			3.88E+01	100%

BALANCE OF PLANT CORE RESULTS

	MEAN (pCi/gm)	MEAN (%)	STD DEV
H-3	6.24E+00	8.46%	10.57%
Cs-137	9.95E+02	34.79%	41.45%
Co-60	6.26E+00	1.23%	1.83%
Fe-55	2.08E+01	18.93%	17.89%
Ni-63	4.67E+01	19.71%	18.76%
Sr-90	2.31E+02	11.74%	24.60%
Pu-238	9.33E-01	0.07%	0.06%
Pu-239/240	9.88E-01	0.06%	0.06%
Pu-241	1.14E+01	2.49%	3.19%
Am-241	1.93E+00	0.29%	0.35%
Cm-245/246	1.00E+00	0.19%	0.17%
U-234	8.36E-01	0.98%	1.15%
U-235	7.69E-02	0.09%	0.11%
U-238	7.90E-01	0.97%	1.10%
		100.00%	

Hot Laboratory 0 ft
Core Location #11
C9000101IFL1C1L0511-01

	Result pCi/gm	MDC pCi/gm	Used pCi/gm	Distribution %
H-3	-9.00E-02	5.20E+00	5.20E+00	0.50%
C-14	-5.30E-01	8.80E-01	8.80E-01	0.09%
Cs-137	9.45E+02	5.00E-01	9.45E+02	91.64%
Co-60	1.82E+00	1.70E-01	1.82E+00	0.18%
Ni-63	2.50E+01	5.20E+01	5.20E+01	5.04%
Sr-90	1.18E+01	5.00E-01	1.18E+01	1.14%
Pu-238	3.90E-01	5.00E-02	3.90E-01	0.04%
Pu-239/240	2.05E-01	2.90E-02	2.05E-01	0.02%
Pu-241	2.20E+00	2.90E+00	2.90E+00	0.28%
Am-241	9.90E+00	9.00E-01	9.90E+00	0.96%
Cm-245/246	1.90E-01	8.00E-02	1.90E-01	0.02%
U-234	3.60E-01	6.00E-02	3.60E-01	0.03%
U-235	9.00E-03	8.90E-02	8.90E-02	0.01%
U-238	4.40E-01	6.00E-02	4.40E-01	0.04%
			1.03E+03	100%

Hot Laboratory 0 ft
Core Location #12
C9000101IFL1C1L0512-01

	Result pCi/gm	MDC pCi/gm	Used pCi/gm	Distribution %
H-3	6.00E-01	5.20E+00	5.20E+00	1.82%
C-14	2.16E+01	1.30E+00	2.16E+01	7.57%
Cs-137	1.13E+02	3.00E-01	1.13E+02	39.60%
Co-60	5.79E+00	1.30E-01	5.79E+00	2.03%
Ni-63	1.42E+01	1.20E+01	1.42E+01	4.98%
Sr-90	1.08E+02	5.00E-01	1.08E+02	37.84%
Pu-238	4.80E-01	3.00E-02	4.80E-01	0.17%
Pu-239/240	6.39E+00	6.00E-02	6.39E+00	2.24%
Pu-241	6.80E+00	3.10E+00	6.80E+00	2.38%
Am-241	1.40E+00	1.90E-01	1.40E+00	0.49%
Cm-245/246	6.00E-01	1.20E-01	6.00E-01	0.21%
U-234	1.04E+00	3.00E-02	1.04E+00	0.36%
U-235	2.80E-02	3.80E-02	3.80E-02	0.01%
U-238	8.50E-01	5.00E-02	8.50E-01	0.30%
			2.85E+02	100%

Hot Laboratory 0 ft
Core Location #13
C9000101IFL1C3L0513-01

	Result pCi/gm	MDC pCi/gm	Used pCi/gm	Distribution %
H-3	7.20E+00	5.40E+00	7.20E+00	0.37%
C-14	4.10E-01	1.20E+00	1.20E+00	0.06%
Cs-137	1.71E+03	6.00E-01	1.71E+03	88.43%
Co-60	2.70E-01	1.70E-01	2.70E-01	0.01%
Ni-63	-3.00E+00	1.10E+01	1.10E+01	0.57%
Sr-90	1.93E+02	6.00E-01	1.93E+02	9.98%
Pu-238	6.50E-01	9.00E-02	6.50E-01	0.03%
Pu-239/240	5.00E-01	4.00E-02	5.00E-01	0.03%
Pu-241	4.70E+00	3.70E+00	4.70E+00	0.24%
Am-241	2.90E+00	1.00E+00	2.90E+00	0.15%
Cm-245/246	3.80E-01	1.20E-01	3.80E-01	0.02%
U-234	9.60E-01	4.00E-02	9.60E-01	0.05%
U-235	5.10E-02	4.60E-02	5.10E-02	0.00%
U-238	8.20E-01	4.00E-02	8.20E-01	0.04%
			1.93E+03	100%

Hot Laboratory 0 ft
Core Location #14
C9000101IFL1C3L0514-01

	Result pCi/gm	MDC pCi/gm	Used pCi/gm	Distribution %
H-3	1.70E+00	5.20E+00	5.20E+00	0.62%
C-14	-6.00E-01	1.30E+00	1.30E+00	0.16%
Cs-137	7.75E+02	5.00E-01	7.75E+02	92.48%
Co-60	3.12E+00	1.20E-01	3.12E+00	0.37%
Ni-63	1.10E+00	1.50E+01	1.50E+01	1.79%
Sr-90	3.30E+01	4.00E-01	3.30E+01	3.94%
Pu-238	9.70E-02	4.90E-02	9.70E-02	0.01%
Pu-239/240	5.90E-01	3.00E-02	5.90E-01	0.07%
Pu-241	7.00E-01	2.80E+00	2.80E+00	0.33%
Am-241	3.20E-01	3.00E-02	3.20E-01	0.04%
Cm-245/246	1.07E-01	8.90E-02	1.07E-01	0.01%
U-234	8.10E-01	7.00E-02	8.10E-01	0.10%
U-235	5.90E-02	7.40E-02	7.40E-02	0.01%
U-238	6.40E-01	5.00E-02	6.40E-01	0.08%
			8.38E+02	100%

HOT LAB CORE RESULTS

	MEAN (pCi/gm)	MEAN (%)	STD DEV
H-3	5.70E+00	0.83%	0.67%
C-14	6.25E+00	1.97%	3.73%
Cs-137	8.86E+02	78.04%	25.69%
Co-60	2.75E+00	0.65%	0.93%
Ni-63	2.31E+01	3.09%	2.27%
Sr-90	8.65E+01	13.23%	16.82%
Pu-238	4.04E-01	0.06%	0.07%
Pu-239/240	1.92E+00	0.59%	1.10%
Pu-241	4.30E+00	0.81%	1.05%
Am-241	3.63E+00	0.41%	0.41%
Cm-245/246	3.19E-01	0.07%	0.10%
U-234	7.93E-01	0.14%	0.15%
U-235	6.30E-02	0.01%	0.00%
U-238	6.88E-01	0.11%	0.12%
		100.00%	

Core Location #21
C9000101IFL1C1L0521-01

	Result pCi/gm	MDC pCi/gm	Used pCi/gm	Distribution %
Cs-137	1.30E-02	1.00E-01	1.00E-01	6.67%
Co-60	4.70E-02	1.30E-01	1.30E-01	8.67%
U-234	6.00E-01	6.00E-02	6.00E-01	40.00%
U-238	6.70E-01	3.00E-02	6.70E-01	44.67%
			1.50E+00	100%

BALANCE OF PLANT

Rx Bldg -25ft, Area 22
Core Location #5
C9000101IFL1C1L0505-01

	Result pCi/gm	MDC pCi/gm	Used pCi/gm	Disribution %
H-3	4.90E+00	5.20E+00	5.20E+00	24.27%
Cs-137	2.86E+00	1.70E-01	2.86E+00	13.35%
Co-60	1.13E+01	1.00E-01	1.13E+01	52.73%
Sr-90	2.07E+00	6.40E-01	2.07E+00	9.66%
			2.14E+01	100%

CTMT -25 ft, Canal E
Core Location #6
C9000101IFL1C3L0506-01

	Result pCi/gm	MDC pCi/gm	Used pCi/gm	Disribution %
H-3	6.40E+00	5.10E+00	6.40E+00	5.08%
Cs-137	1.17E+02	2.00E-01	1.17E+02	92.81%
Co-60	2.21E+00	1.20E-01	2.21E+00	1.75%
Sr-90	4.60E-01	4.40E-01	4.60E-01	0.36%
			1.26E+02	100%

Rx Bldg -15 ft, SE Area
Core Location #7
C9000101IFL1C1L0507-01

	Result pCi/gm	MDC pCi/gm	Used pCi/gm	Disribution %
H-3	3.00E+00	5.20E+00	5.20E+00	77.27%
Cs-137	7.20E-01	1.10E-01	7.20E-01	10.70%
Co-60	1.40E-01	2.40E-01	2.40E-01	3.57%
Sr-90	4.00E-02	5.70E-01	5.70E-01	8.47%
			6.73E+00	100%

CTMT -25 ft, Area 18
Core Location #9
C9000101IFL1C3L0509-01

	Result pCi/gm	MDC pCi/gm	Used pCi/gm	Disribution %
H-3	1.11E+01	5.10E+00	1.11E+01	89.57%
Cs-137	6.10E-01	8.00E-02	6.10E-01	4.92%
Co-60	2.32E-01	2.10E-01	2.32E-01	1.87%
Sr-90	-3.00E-01	4.50E-01	4.50E-01	3.63%
			1.24E+01	100%

Waste Handling Bldg -15 ft
Core Location #10
C9000101IFL1C3L0507-01

	Result pCi/gm	MDC pCi/gm	Used pCi/gm	Disribution %
H-3	2.70E+00	5.30E+00	5.30E+00	0.17%
Cs-137	3.15E+03	8.00E-01	3.15E+03	99.79%
Co-60	-3.30E-02	1.10E-01	1.10E-01	0.00%
Sr-90	1.20E+00	4.80E-02	1.20E+00	0.04%
			3.16E+03	100%

Hot Pipe Tunnel, -12 ft
Core Location #15
C9000101IFL1C1L0515-01

	Result pCi/gm	MDC pCi/gm	Used pCi/gm	Disribution %
H-3	1.60E+00	5.30E+00	5.30E+00	0.10%
Cs-137	4.43E+03	1.00E+00	4.43E+03	80.95%
Co-60	2.69E+01	3.00E-01	2.69E+01	0.49%
Sr-90	1.01E+03	1.00E+00	1.01E+03	18.46%
			5.47E+03	100%

Hot Pipe Tunnel, -12 ft
Core Location #16
C9000101IFL1C1L0516-01

	Result pCi/gm	MDC pCi/gm	Used pCi/gm	Disribution %
H-3	2.10E+00	5.20E+00	5.20E+00	0.47%
Cs-137	2.60E+02	4.00E-01	2.60E+02	23.42%
Co-60	8.97E+00	2.40E-01	8.97E+00	0.81%
Sr-90	8.36E+02	2.00E+00	8.36E+02	75.30%
			1.11E+03	100%

Fan House -12 ft
Core Location #17
C9000101IFL1C1L0517-01

	Result pCi/gm	MDC pCi/gm	Used pCi/gm	Disribution %
H-3	6.20E+00	5.30E+00	6.20E+00	85.87%
Cs-137	4.10E-01	9.00E-02	4.10E-01	5.68%
Co-60	-2.70E-02	1.10E-01	1.10E-01	1.52%
Sr-90	0.00E+00	5.00E-01	5.00E-01	6.93%
			7.22E+00	100%

BALANCE OF PLANT CORE RESULTS

	MEAN (pCi/gm)	MEAN (%)	STD DEV
H-3	6.24E+00	35.35%	41.38%
Cs-137	9.95E+02	41.45%	41.88%
Co-60	6.26E+00	7.84%	18.17%
Sr-90	2.31E+02	15.36%	24.93%
		100.00%	

HOT LABORATORY

Hot Laboratory 0 ft
Core Location #11
C9000101IFL1C1L0511-01

	Result pCi/gm	MDC pCi/gm	Used pCi/gm	Disribution %
Cs-137	9.45E+02	5.00E-01	9.45E+02	98.58%
Co-60	1.82E+00	1.70E-01	1.82E+00	0.19%
Sr-90	1.18E+01	5.00E-01	1.18E+01	1.23%
			9.59E+02	100%

Hot Laboratory 0 ft
Core Location #12
C9000101IFL1C1L0512-01

	Result pCi/gm	MDC pCi/gm	Used pCi/gm	Disribution %
Cs-137	1.13E+02	3.00E-01	1.13E+02	49.83%
Co-60	5.79E+00	1.30E-01	5.79E+00	2.55%
Sr-90	1.08E+02	5.00E-01	1.08E+02	47.62%
			2.27E+02	100%

Hot Laboratory 0 ft
Core Location #13
C9000101IFL1C3L0513-01

	Result pCi/gm	MDC pCi/gm	Used pCi/gm	Disribution %
Cs-137	1.71E+03	6.00E-01	1.71E+03	89.85%
Co-60	2.70E-01	1.70E-01	2.70E-01	0.01%
Sr-90	1.93E+02	6.00E-01	1.93E+02	10.14%
			1.90E+03	100%

Hot Laboratory 0 ft
Core Location #14
C9000101IFL1C3L0514-01

	Result pCi/gm	MDC pCi/gm	Used pCi/gm	Disribution %
Cs-137	7.75E+02	5.00E-01	7.75E+02	95.55%
Co-60	3.12E+00	1.20E-01	3.12E+00	0.38%
Sr-90	3.30E+01	4.00E-01	3.30E+01	4.07%
			8.11E+02	100%

HOT LAB CORE RESULTS

	MEAN (pCi/gm)	MEAN (%)	STD DEV
Cs-137	8.86E+02	83.45%	22.71%
Co-60	2.75E+00	0.79%	1.19%
Sr-90	8.65E+01	15.77%	21.56%
		100.00%	

BALANCE OF PLANT

Rx Bldg -25ft, Area 22
Core Location #5
C9000101IFL1C1L8505-01
Surrogate

	DCGL (pCi/100cm²)	Results (pCi/gm)	MDA (pCi/gm)	Used (pCi/gm)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	4.85E+04	2.86E+00	1.70E-01	2.86E+00	13.35%	1.00	2.47E-05
H-3	9.10E+06	4.90E+00	5.20E+00	5.20E+00	24.27%	1.82	2.00E-07
Co-60	1.10E+04	1.13E+01	1.00E-01	1.13E+01	52.73%	N/A	N/A
Sr-90	3.31E+04	2.07E+00	6.40E-01	2.07E+00	9.66%	N/A	N/A
				2.14E+01	100.00%		

Adjusted Gross DCGL

	DCGL (pCi/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	4.85E+04	0.13	0.18	3.32E-06	2,463.40	6.13E-02
Co-60	1.10E+04	0.53	0.70	4.79E-05	8,733.00	8.85E-01
Sr-90	3.31E+04	0.10	0.13	2.82E-06	1,782.85	5.39E-02
		0.76	1.00	5.42E-05		1
		Adjusted Gross DCGL		13979	dpm/100cm²	

CTMT -25 ft, Canal E
Core Location #6
C9000101IFL1C3L8506-01
Surrogate

	DCGL (pCi/100cm²)	Results (pCi/gm)	MDA (pCi/gm)	Used (pCi/gm)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	4.85E+04	1.17E+02	2.00E-01	1.17E+02	92.81%	1.00	2.47E-05
H-3	9.10E+06	5.40E+00	5.10E+00	5.40E+00	5.08%	0.05	6.01E-09
Co-60	1.10E+04	2.21E+00	1.20E-01	2.21E+00	1.75%	N/A	N/A
Sr-90	3.31E+04	4.80E-01	4.40E-01	4.80E-01	0.38%	N/A	N/A
				1.26E+02	100.00%		

Adjusted Gross DCGL

	DCGL (pCi/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	4.85E+04	0.93	0.98	2.29E-05	37,886.46	9.31E-01
Co-60	1.10E+04	0.02	0.02	1.59E-06	711.86	6.47E-02
Sr-90	3.31E+04	0.00	0.00	1.10E-07	148.18	4.48E-03
		0.95	1.00	2.46E-05		1
		Adjusted Gross DCGL		38549	dpm/100cm²	

Rx Bldg -15 ft, SE Area
Core Location #7
C9000101IFL1C1L8507-01
Surrogate

	DCGL (pCi/100cm²)	Results (pCi/gm)	MDA (pCi/gm)	Used (pCi/gm)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	4.85E+04	7.20E-01	1.10E-01	7.20E-01	10.70%	1.00	2.47E-05
H-3	9.10E+06	3.00E+00	5.20E+00	5.20E+00	77.27%	7.22	7.94E-07
Co-60	1.10E+04	1.40E-01	2.40E-01	2.40E-01	3.57%	N/A	N/A
Sr-90	3.31E+04	4.00E-02	5.70E-01	5.70E-01	8.47%	N/A	N/A
				6.73E+00	100.00%		

Adjusted Gross DCGL

	DCGL (pCi/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	3.92E+04	0.11	0.47	2.73E-06	12,546.10	3.20E-01
Co-60	1.10E+04	0.04	0.16	3.24E-06	4,162.06	3.80E-01
Sr-90	3.31E+04	0.08	0.37	2.36E-06	8,832.40	3.00E-01
		0.23	1.00	8.53E-06		1
		Adjusted Gross DCGL		28661	dpm/100cm²	

CTMT -25 ft, Area 18
Core Location #9
C9000101IFL1C3L8509-01
Surrogate

	DCGL (pCi/100cm²)	Results (pCi/gm)	MDA (pCi/gm)	Used (pCi/gm)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	4.85E+04	6.10E-01	8.00E-02	6.10E-01	4.92%	1.00	2.47E-05
H-3	9.10E+06	1.11E+01	5.10E+00	1.11E+01	89.57%	18.20	2.00E-06
Co-60	1.10E+04	2.32E-01	2.10E-01	2.32E-01	1.87%	N/A	N/A
Sr-90	3.31E+04	-3.00E-01	4.50E-01	4.98E-01	3.83%	N/A	N/A
				1.24E+01	100.00%		

Adjusted Gross DCGL

	DCGL (pCi/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	3.75E+04	0.05	0.47	1.31E-06	11,868.39	3.19E-01
Co-60	1.10E+04	0.02	0.18	1.70E-06	4,551.91	4.14E-01
Sr-90	3.31E+04	0.04	0.35	1.10E-06	8,829.14	2.67E-01
		0.10	1.00	4.11E-06		1
		Adjusted Gross DCGL		25349	dpm/100cm²	

Waste Handling Bldg -15 ft
Core Location #10
C9000101IFL1C3L8507-01
Surrogate

	DCGL (pCi/100cm²)	Results (pCi/gm)	MDA (pCi/gm)	Used (pCi/gm)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	4.85E+04	3.15E+03	9.00E-01	3.15E+03	99.79%	1.00	2.47E-05
H-3	9.10E+06	2.70E+00	5.30E+00	5.30E+00	0.17%	0.00	1.85E-10
Co-60	1.10E+04	-3.30E-02	1.10E-01	1.10E-01	0.00%	N/A	N/A
Sr-90	3.31E+04	1.20E+00	4.80E-02	1.20E+00	0.04%	N/A	N/A
				3.16E+03	100.00%		

Adjusted Gross DCGL

	DCGL (pCi/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	4.85E+04	1.00	1.00	2.46E-05	40,475.63	8.99E-01
Co-60	1.10E+04	0.00	0.00	3.17E-09	1.41	1.26E-04
Sr-90	3.31E+04	0.00	0.00	1.15E-08	15.42	4.66E-04
		1.00	1.00	2.47E-05		1
		Adjusted Gross DCGL		40492	dpm/100cm²	

Hot Pipe Tunnel, -12 ft
Core Location #15
C9000101IFL1C1L8515-01
Surrogate

	DCGL (pCi/100cm²)	Results (pCi/gm)	MDA (pCi/gm)	Used (pCi/gm)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	4.85E+04	4.43E+03	1.00E+00	4.43E+03	80.85%	1.00	2.47E-05
H-3	9.10E+06	1.60E+00	5.30E+00	5.30E+00	0.10%	0.00	1.31E-10
Co-60	1.10E+04	2.99E+01	3.00E-01	2.99E+01	0.46%	N/A	N/A
Sr-90	3.31E+04	1.01E+03	1.00E+00	1.01E+03	18.46%	N/A	N/A
				5.47E+03	100.00%		

Adjusted Gross DCGL

	DCGL (pCi/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	4.85E+04	0.81	0.81	2.00E-05	31,122.15	7.86E-01
Co-60	1.10E+04	0.00	0.00	4.47E-07	188.98	1.72E-02
Sr-90	3.31E+04	0.18	0.18	5.58E-06	7,095.57	2.14E-01
		1.00	1.00	2.60E-05		1
		Adjusted Gross DCGL		38467	dpm/100cm²	

Hot Pipe Tunnel, -12 ft
Core Location #16
C9000101IFL1C1L8516-01
Surrogate

	DCGL (pCi/100cm²)	Results (pCi/gm)	MDA (pCi/gm)	Used (pCi/gm)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	4.85E+04	2.60E+02	4.00E-01	2.60E+02	23.42%	1.00	2.47E-05
H-3	9.10E+06	2.10E+00	5.20E+00	5.20E+00	0.47%	0.02	2.20E-09
Co-60	1.10E+04	8.97E+00	2.40E-01	8.97E+00	0.81%	N/A	N/A
Sr-90	3.31E+04	8.36E+02	2.80E+00	8.36E+02	75.30%	N/A	N/A
				1.11E+03	100.00%		

Adjusted Gross DCGL

	DCGL (pCi/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	4.85E+04	0.23	0.24	5.79E-06	8,001.83	1.89E-01
Co-60	1.10E+04	0.01	0.01	7.35E-07	276.06	2.51E-02
Sr-90	3.31E+04	0.75	0.76	2.26E-05	25,728.95	7.77E-01
		1.00	1.00	2.93E-05		1
		Adjusted Gross DCGL		34007	dpm/100cm²	

Fan House -12 ft
Core Location #17
C9000101IFL1C1L8517-01
Surrogate

	DCGL (pCi/100cm²)	Results (pCi/gm)	MDA (pCi/gm)	Used (pCi/gm)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	4.85E+04	4.10E-01	9.00E-02	4.10E-01	5.68%	1.00	2.47E-05
H-3	9.10E+06	6.20E+00	5.30E+00	6.20E+00	85.87%	15.12	1.86E-06
Co-60	1.10E+04	-2.70E-02	1.10E-01	1.10E-01	1.52%	N/A	N/A
Sr-90	3.31E+04	0.00E+00	5.00E-01	5.80E-01	8.03%	N/A	N/A
				7.22E+00	100.00%		

Adjusted Gross DCGL

	DCGL (pCi/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	3.79E+04	0.05	0.40	1.50E-06	11,417.27	3.01E-01
Co-60	1.10E+04	0.02	0.11	1.39E-06	3,063.17	2.78E-01
Sr-90	3.31E+04	0.07	0.49	2.09E-06	13,923.50	4.21E-01
		0.14	1.00	4.97E-06		1
		Adjusted Gross DCGL		28404	dpm/100cm²	

BOP Core Samples Mean Distribution
Surrogate

	DCGL (pCi/100cm²)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	4.85E+04	41.45%	1.00	2.47E-05
H-3	9.10E+06	35.35%	0.85	9.37E-08
Co-60	1.10E+04	7.84%	N/A	N/A
Sr-90	3.31E+04	15.36%	N/A	N/A
		100.00%		

Adjusted Gross DCGL

	DCGL (pCi/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	4.85E+04	0.41	0.64	1.03E-05	16,804.52	4.66E-01
Co-60	1.10E+04	0.08	0.12	7.13E-06	3,558.15	3.23E-01
Sr-90	3.31E+04	0.15	0.24	4.64E-06	6,966.24	2.10E-01
		0.65	1.00	2.20E-05		1
		Adjusted Gross DCGL		39329	dpm/100cm²	

	Mean Conc (pCi/liter)	Mean Distribution	Std Deviation
Cs-137	8.95E+02	41.45%	41.88%
H-3	6.24E+00	35.35%	41.36%
Co-60	6.26E+00	7.84%	18.17%
Sr-90	2.31E+02	15.36%	24.93%

Area	
Rx Bldg -25ft, Area 22	13979
CTMT -25 ft, Canal E	38549
Rx Bldg -15 ft, SE Area	28661
CTMT -25 ft, Area 18	25349
Waste Handling Bldg -15 ft	40492
Hot Pipe Tunnel, -12 ft	38467
Hot Pipe Tunnel, -12 ft	34007
Fan House -12 ft	28404
BOP Core Samples Mean Distribution	29329
Mean	30731
Median	31205
Minimum	13979
Maximum	40492
Standard Deviation	8675

HOT LABORATORY

Hot Laboratory 0 ft
Core Location #11
C90001101FL1C1L0511-01
Surrogate
Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	4.85E+04	0.99	0.99	2.43E-05	38,613.82	9.78E-01
Co-60	1.10E+04	0.00	0.00	1.73E-07	76.31	6.94E-03
Sr-90	3.31E+04	0.01	0.01	3.72E-07	494.63	1.49E-02
		1.00	1.00	2.49E-05		1
			Adjusted Gross DCGL		40185	dpm/100cm²

Hot Laboratory 0 ft
Core Location #12
C90001101FL1C1L0512-01
Surrogate
Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	4.85E+04	0.50	0.50	1.23E-05	17,175.02	4.34E-01
Co-60	1.10E+04	0.03	0.03	2.32E-06	680.02	8.00E-02
Sr-90	3.31E+04	0.46	0.46	1.44E-05	16,415.06	4.95E-01
		1.00	1.00	2.90E-05		1
			Adjusted Gross DCGL		34470	dpm/100cm²

Hot Laboratory 0 ft
Core Location #13
C90001101FL1C3L0513-01
Surrogate
Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	4.85E+04	0.90	0.90	2.22E-05	35,567.51	8.78E-01
Co-60	1.10E+04	0.00	0.00	1.29E-08	0.82	5.11E-04
Sr-90	3.31E+04	0.10	0.10	3.05E-06	4,014.33	1.21E-01
		1.00	1.00	2.53E-05		1
			Adjusted Gross DCGL		39587	dpm/100cm²

Hot Laboratory 0 ft
Core Location #14
C90001101FL1C3L0514-01
Surrogate
Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	4.85E+04	0.96	0.96	2.36E-05	37,859.60	9.37E-01
Co-60	1.10E+04	0.00	0.00	3.50E-07	152.84	1.39E-02
Sr-90	3.31E+04	0.04	0.04	1.23E-06	1,816.33	4.86E-02
		1.00	1.00	2.52E-05		1
			Adjusted Gross DCGL		39729	dpm/100cm²

Hot Laboratory Mean Distribution
Surrogate
Adjusted Gross DCGL

	DCGL (dpm/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	4.85E+04	0.83	0.83	2.05E-05	31,995.33	7.90E-01
Co-60	1.10E+04	0.01	0.01	7.14E-07	301.15	2.74E-02
Sr-90	3.31E+04	0.16	0.16	4.76E-06	6,044.54	1.83E-01
		1.00	1.00	2.61E-05		1
			Adjusted Gross DCGL		38341	dpm/100cm²

Area	
Hot Laboratory 0 ft	40185
Hot Laboratory 0 ft	34470
Hot Laboratory 0 ft	39587
Hot Laboratory 0 ft	39729
Hot Laboratory Mean Distribution	38341
Mean	38493
Median	39658
Minimum	34470
Maximum	40185
Standard Deviation	2694

BALANCE OF PLANT

Rx Bldg -23A, Area 22
Core Location #5
C9000101IFL1C1L8505-01
Surrogate

	DCGL (pCi/gram²)	Results (pCi/gm)	MDA (pCi/gm)	Used (pCi/gm)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	1.22E+05	2.86E+00	1.70E-01	2.86E+00	13.39%	1.00	8.20E-06
H-3	9.19E+06	4.90E+00	5.20E+00	5.20E+00	24.27%	1.82	2.00E-07
Co-60	1.83E+05	1.13E+01	1.00E-01	1.13E+01	52.73%	N/A	N/A
Sr-90	3.31E+04	2.07E+00	8.40E-01	2.07E+00	8.66%	N/A	N/A
				2.14E+01	100.00%		

Adjusted Gross DCGL

	DCGL (pCi/gram²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	1.19E+05	0.13	0.18	1.12E-06	19,285.17	1.82E-01
Co-60	1.83E+05	0.53	0.70	2.88E-06	76,196.67	4.16E-01
Sr-90	3.31E+04	0.10	0.13	2.92E-06	13,958.15	4.22E-01
		0.76	1.00	6.92E-06		1

Adjusted Gross DCGL 109440 dpm/100cm²

CTMT -23 ft, Canal E
Core Location #6
C9000101IFL1C3L8506-01
Surrogate

	DCGL (pCi/gram²)	Results (pCi/gm)	MDA (pCi/gm)	Used (pCi/gm)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	1.22E+05	1.17E+02	2.00E-01	1.17E+02	92.81%	1.00	8.20E-06
H-3	9.19E+06	6.40E+00	5.10E+00	6.40E+00	5.08%	0.05	5.01E-09
Co-60	1.83E+05	2.21E+00	1.20E-01	2.21E+00	1.75%	N/A	N/A
Sr-90	3.31E+04	4.60E-01	4.40E-01	4.90E-01	0.39%	N/A	N/A
				1.26E+02	100.00%		

Adjusted Gross DCGL

	DCGL (pCi/gram²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	1.22E+05	0.93	0.96	7.61E-06	116,898.16	9.74E-01
Co-60	1.83E+05	0.02	0.02	9.58E-08	2,242.08	1.23E-02
Sr-90	3.31E+04	0.00	0.00	1.10E-07	466.68	1.41E-02
		0.95	1.00	7.82E-06		1

Adjusted Gross DCGL 121407 dpm/100cm²

Rx Bldg -15 ft, SE Area
Core Location #7
C9000101IFL1C1L8507-01
Surrogate

	DCGL (pCi/gram²)	Results (pCi/gm)	MDA (pCi/gm)	Used (pCi/gm)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	1.22E+05	7.20E-01	1.10E-01	7.20E-01	10.70%	1.00	8.20E-06
H-3	9.19E+06	3.00E+00	5.20E+00	5.20E+00	77.27%	7.22	7.84E-07
Co-60	1.83E+05	1.40E-01	2.40E-01	2.40E-01	3.57%	N/A	N/A
Sr-90	3.31E+04	4.00E-02	5.70E-01	5.79E-01	8.47%	N/A	N/A
				6.73E+00	100.00%		

Adjusted Gross DCGL

	DCGL (pCi/gram²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	1.11E+05	0.11	0.47	8.62E-07	28,794.14	2.59E-01
Co-60	1.83E+05	0.04	0.16	1.95E-07	9,598.05	5.24E-02
Sr-90	3.31E+04	0.08	0.37	2.56E-06	22,795.36	6.89E-01
		0.23	1.00	3.72E-06		1

Adjusted Gross DCGL 81188 dpm/100cm²

CTMT -23 ft, Area 18
Core Location #9
C9000101IFL1C3L8508-01
Surrogate

	DCGL (pCi/gram²)	Results (pCi/gm)	MDA (pCi/gm)	Used (pCi/gm)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	1.22E+05	6.10E-01	8.00E-02	6.10E-01	4.82%	1.00	8.20E-06
H-3	9.19E+06	1.11E+01	5.10E+00	1.11E+01	89.57%	18.20	2.00E-06
Co-60	1.83E+05	2.32E-01	2.10E-01	2.32E-01	1.87%	N/A	N/A
Sr-90	3.31E+04	-3.00E-01	4.50E-01	4.50E-01	3.63%	N/A	N/A
				1.24E+01	100.00%		

Adjusted Gross DCGL

	DCGL (pCi/gram²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	9.81E+04	0.05	0.47	5.02E-07	28,933.87	2.95E-01
Co-60	1.83E+05	0.02	0.18	1.02E-07	11,004.28	6.01E-02
Sr-90	3.31E+04	0.04	0.35	1.10E-06	21,344.51	6.45E-01
		0.10	1.00	1.70E-06		1

Adjusted Gross DCGL 81282 dpm/100cm²

Waste Handling Bldg -15 ft
Core Location #10
C9000101IFL1C3L8507-01
Surrogate

	DCGL (pCi/gram²)	Results (pCi/gm)	MDA (pCi/gm)	Used (pCi/gm)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	1.22E+05	3.15E+03	8.00E-01	3.15E+03	99.79%	1.00	8.20E-06
H-3	9.19E+06	2.70E+00	5.30E+00	5.30E+00	0.17%	0.00	1.85E-10
Co-60	1.83E+05	-3.30E-02	1.10E-01	1.10E-01	0.00%	N/A	N/A
Sr-90	3.31E+04	1.20E+00	4.80E-02	1.20E+00	0.04%	N/A	N/A
				3.16E+03	100.00%		

Adjusted Gross DCGL

	DCGL (pCi/gram²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	1.22E+05	1.00	1.00	8.19E-06	121,823.36	8.99E-01
Co-60	1.83E+05	0.00	0.00	1.90E-10	4.25	2.32E-05
Sr-90	3.31E+04	0.00	0.00	1.15E-08	46.41	1.40E-03
		1.00	1.00	8.19E-06		1

Adjusted Gross DCGL 121874 dpm/100cm²

Hot Pipe Tunnel, -12 ft
Core Location #15
C9000101IFL1C1L8515-01
Surrogate

	DCGL (pCi/gram²)	Results (pCi/gm)	MDA (pCi/gm)	Used (pCi/gm)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	1.22E+05	4.43E+03	1.00E+00	4.43E+03	80.95%	1.00	8.20E-06
H-3	9.19E+06	1.60E+00	5.30E+00	5.30E+00	0.10%	0.00	1.31E-10
Co-60	1.83E+05	2.69E+01	3.00E-01	2.69E+01	0.49%	N/A	N/A
Sr-90	3.31E+04	1.01E+03	1.00E+00	1.01E+03	18.46%	N/A	N/A
				5.47E+03	100.00%		

Adjusted Gross DCGL

	DCGL (pCi/gram²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	1.22E+05	0.81	0.81	6.64E-06	86,146.41	5.42E-01
Co-60	1.83E+05	0.00	0.00	2.66E-08	401.86	2.18E-03
Sr-90	3.31E+04	0.18	0.18	5.58E-06	15,080.78	4.56E-01
		1.00	1.00	1.22E-05		1

Adjusted Gross DCGL 81629 dpm/100cm²

Hot Pipe Tunnel, -12 ft
Core Location #16
C9000101IFL1C1L8516-01
Surrogate

	DCGL (pCi/gram²)	Results (pCi/gm)	MDA (pCi/gm)	Used (pCi/gm)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	1.22E+05	2.60E+02	4.00E-01	2.60E+02	23.42%	1.00	8.20E-06
H-3	9.19E+06	2.10E+00	5.20E+00	5.20E+00	0.47%	0.02	2.20E-09
Co-60	1.83E+05	8.97E+00	2.40E-01	8.97E+00	0.81%	N/A	N/A
Sr-90	3.31E+04	8.36E+02	2.00E+00	8.36E+02	75.30%	N/A	N/A
				1.11E+03	100.00%		

Adjusted Gross DCGL

	DCGL (pCi/gram²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	1.22E+05	0.23	0.24	1.92E-06	8,476.07	7.77E-02
Co-60	1.83E+05	0.01	0.01	4.42E-08	326.82	1.79E-03
Sr-90	3.31E+04	0.75	0.76	2.26E-05	30,469.21	9.21E-01
		1.00	1.00	2.47E-05		1

Adjusted Gross DCGL 40272 dpm/100cm²

Fan House -12 ft
Core Location #17
C9000101IFL1C1L8517-01
Surrogate

	DCGL (pCi/gram²)	Results (pCi/gm)	MDA (pCi/gm)	Used (pCi/gm)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	1.22E+05	4.10E-01	9.00E-02	4.10E-01	5.69%	1.00	8.20E-06
H-3	9.19E+06	6.20E+00	5.30E+00	6.20E+00	85.87%	15.12	1.86E-06
Co-60	1.83E+05	-2.70E-02	1.10E-01	1.10E-01	1.52%	N/A	N/A
Sr-90	3.31E+04	0.00E+00	5.00E-01	5.80E-01	8.03%	N/A	N/A
				7.22E+00	100.00%		

Adjusted Gross DCGL

	DCGL (pCi/gram²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	1.01E+05	0.05	0.40	5.60E-07	20,760.75	2.05E-01
Co-60	1.83E+05	0.02	0.11	8.33E-08	5,569.86	3.04E-02
Sr-90	3.31E+04	0.07	0.49	2.09E-06	25,317.98	7.65E-01
		0.14	1.00	2.74E-06		1

Adjusted Gross DCGL 81649 dpm/100cm²

BOP Core Samples Mean Distribution
Surrogate

	DCGL (pCi/gram²)	Nuclide Distribution	Ratio to Surrogate	Ratio/ DCGL
Cs-137	1.22E+05	41.45%	1.00	8.20E-06
H-3	9.19E+06	35.35%	0.85	9.37E-08
Co-60	1.83E+05	7.84%	N/A	N/A
Sr-90	3.31E+04	15.36%	N/A	N/A
		100.00%		

Adjusted Gross DCGL

	DCGL (pCi/gram²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Cs-137	1.21E+05	0.41	0.84	3.44E-06	46,741.43	4.04E-01
Co-60	1.83E+05	0.08	0.12	4.29E-07	9,222.75	5.04E-02
Sr-90	3.31E+04	0.15	0.24	4.64E-06	38,056.55	5.46E-01
		0.65	1.00	8.50E-06		1

Adjusted Gross DCGL 76021 dpm/100cm²

	Mean Conc (pCi/liter)	Mean Distribution	Std Deviation
Cs-137	8.55E+02	41.45%	41.88%
H-3	6.24E+00	35.35%	41.38%
Co-60	6.26E+00	7.84%	16.17%
Sr-90	2.31E+02	15.36%	24.93%

Area	
Rx Bldg -23A, Area 22	109440
CTMT -23 ft, Canal E	121407
Rx Bldg -15 ft, SE Area	81188
CTMT -23 ft, Area 18	81282
Waste Handling Bldg -15 ft	121874
Hot Pipe Tunnel, -12 ft	81629
Hot Pipe Tunnel, -12 ft	40272
Fan House -12 ft	81649
BOP Core Samples Mean Distribution	76021
Mean	81093
Median	71456
Minimum	40272
Maximum	121874
Standard Deviation	32545

HOT LABORATORY

Hot Laboratory 0 ft
Core Location 811
C9000101FL1C1L0511-01
Surrogate
Adjusted Gross DCGL

	DCGL (pCi/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Co-137	1.22E+05	0.99	0.99	8.08E-06	116,466.26	9.55E-01
Co-60	1.83E+05	0.00	0.00	1.04E-08	224.40	1.23E-03
Sr-90	3.31E+04	0.01	0.01	3.72E-07	1,454.53	4.39E-02
		1.00	1.00	8.46E-06		1
			Adjusted Gross DCGL	118168	dpm/100cm²	

Hot Laboratory 0 ft
Core Location 812
C9000101FL1C1L0512-01
Surrogate
Adjusted Gross DCGL

	DCGL (pCi/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Co-137	1.22E+05	0.50	0.50	4.08E-06	26,772.76	2.19E-01
Co-60	1.83E+05	0.03	0.03	1.40E-07	1,371.80	7.50E-03
Sr-90	3.31E+04	0.48	0.48	1.44E-05	25,588.12	7.73E-01
		1.00	1.00	1.86E-05		1
			Adjusted Gross DCGL	53733	dpm/100cm²	

Hot Laboratory 0 ft
Core Location 813
C9000101FL1C3L0513-01
Surrogate
Adjusted Gross DCGL

	DCGL (pCi/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Co-137	1.22E+05	0.90	0.90	7.36E-06	86,151.81	7.0E-01
Co-60	1.83E+05	0.00	0.00	7.79E-10	13.62	7.44E-05
Sr-90	3.31E+04	0.10	0.10	3.05E-06	9,723.53	2.94E-01
		1.00	1.00	1.04E-05		1
			Adjusted Gross DCGL	95899	dpm/100cm²	

Hot Laboratory 0 ft
Core Location 814
C9000101FL1C3L0514-01
Surrogate
Adjusted Gross DCGL

	DCGL (pCi/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Co-137	1.22E+05	0.95	0.95	7.83E-06	105,206.33	8.82E-01
Co-60	1.83E+05	0.00	0.00	2.10E-08	423.59	2.31E-03
Sr-90	3.31E+04	0.04	0.04	1.23E-06	4,479.70	1.35E-01
		1.00	1.00	9.08E-06		1
			Adjusted Gross DCGL	110110	dpm/100cm²	

Hot Laboratory Mean Distribution
Surrogate
Adjusted Gross DCGL

	DCGL (pCi/100cm²)	Nuclide Fraction	Beta Nuclide Fraction	Fraction/ DCGL	Unity Rule Check Gross*Fract	Fract/DCGL
Co-137	1.22E+05	0.83	0.83	6.84E-06	71,655.36	5.87E-01
Co-60	1.83E+05	0.01	0.01	4.29E-08	874.44	3.86E-03
Sr-90	3.31E+04	0.16	0.16	4.76E-06	13,337.09	4.06E-01
		1.00	1.00	1.16E-05		1
			Adjusted Gross DCGL	85867	dpm/100cm²	

Area	
Hot Laboratory 0 ft	118168
Hot Laboratory 0 ft	53733
Hot Laboratory 0 ft	95899
Hot Laboratory 0 ft	110110
Hot Laboratory Mean Distribution	85867
Mean	94475
Median	102999
Minimum	53733
Maximum	118168
Standard Deviation	26681

Final Status Survey Plan
for the
Plum Brook Reactor Facility

Attachment A
Radionuclide Distribution Basis for DCGL Determination, and Final Status Survey of the Plum Brook Reactor Facility (PBRF)

Addendum 7
RESRAD and RESRAD-BUILD Models Used for Evaluation of Structural Radionuclide Distribution Using Core Samples

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th BOP CORE MIX.bld

RESRAD-BUILD Table of Contents

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th BOP CORE MIX.bld

RESRAD-BUILD Input Parameters

Number of Sources : 6
Number of Receptors: 1
Total Time : 3.652500E+02 days
Fraction Inside : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	7.500	2.500	1.000	1.000	3.36E+01	0.00E+00

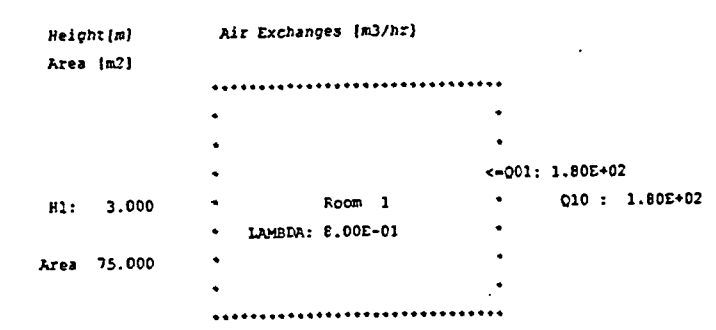
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete
1	2	2.40E+00	0.00E+00	Concrete
1	3	2.40E+00	0.00E+00	Concrete
1	4	2.40E+00	0.00E+00	Concrete
1	5	2.40E+00	0.00E+00	Concrete
1	6	2.40E+00	0.00E+00	Concrete

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th BOP CORE MIX.bld

-------- Building Information --------

Building Air Exchange Rate: 8.00E-01 1/hr



Deposition velocity: 2.70E-06 [m/s] Resuspension Rate: 1.40E-05 [1/s]

-------- Source Information --------

Source: 1
Location:: Room : 1 x: 0.00 y: 2.50 z: 1.50[m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/(pCi/m3)]
FE-55	1.000E-10	6.070E-07	2.690E-06	0.000E+00

Source: 2
Location:: Room : 1 x: 15.00 y: 2.50 z: 1.50[m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/(pCi/m3)]
FE-55	1.000E-10	6.070E-07	2.690E-06	0.000E+00

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th BOP CORE MIX.bld

Source: 3
Location:: Room : 1 x: 7.50 y: 0.00 z: 1.50[m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
FE-55	1.000E-10	6.070E-07	2.690E-06	0.000E+00

Source: 4
Location:: Room : 1 x: 7.50 y: 5.00 z: 1.50[m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
FE-55	1.000E-10	6.070E-07	2.690E-06	0.000E+00

Source: 5

Location:: Room : 1 x: 7.50 y: 2.50 z: 0.00[m]

Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 4.070E-07 [1/hr]

Fraction released to air: 7.000E-02

Removable fraction: 1.000E-01

Time to Remove: 1.820E+04 [day]

Radon Release Fraction: 0.000E+00

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
	[pCi/m2]	Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/ (pCi/m3)]
PU-241	2.490E+00	6.850E-05	8.250E-03	2.560E-08
AM-241	2.900E-01	3.640E-03	4.440E-01	9.570E-05
PU-239	6.000E-02	3.540E-03	4.290E-01	4.960E-07
PU-238	7.000E-02	3.200E-03	3.920E-01	5.710E-07
NP-237	0.000E+00	4.440E-03	5.400E-01	1.210E-03
U-238	9.700E-01	2.690E-04	1.180E-01	1.600E-04
U-235	9.000E-02	2.670E-04	1.230E-01	9.030E-04
U-234	9.800E-01	2.830E-04	1.320E-01	8.930E-07
U-233	0.000E+00	2.890E-04	1.350E-01	1.910E-06
PA-231	0.000E+00	1.060E-02	1.280E+00	2.010E-04
TH-230	0.000E+00	5.460E-04	3.260E-01	2.040E-06
TH-229	0.000E+00	4.030E-03	2.160E+00	1.720E-03
AC-227	0.000E+00	1.480E-02	6.720E+00	2.160E-03
RA-226	0.000E+00	1.330E-03	8.600E-03	1.040E-02
PB-210	0.000E+00	5.370E-03	1.380E-02	1.050E-05
SR-90	1.170E+01	1.530E-04	1.310E-03	2.310E-05
NI-63	1.970E+01	5.770E-07	6.290E-06	0.000E+00
FE-55	1.890E+01	6.070E-07	2.690E-06	0.000E+00

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th BOF CORE MIX.bld

Source: 6
Location:: Room : 1 x: 7.50 y: 2.50 z: 3.00[m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
	[pCi/m2]	Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/ (pCi/m3)]
FE-55	1.000E-10	6.070E-07	2.690E-06	0.000E+00

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th BOP CORE MIX.bld
Evaluation Time: 0.00000000E+00 years

==========
==========
=== Assessment for Time: 1 ===
=== Time =0.00E+00 yr ===
==========
==========

======== Source Information ========

Source: 1
Location:: Room : 1 x: 0.00 y: 2.50 z: 1.50 [m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination:: Nuclide Concentration
[pCi/m2]
FE-55 1.000E-10

Source: 2
Location:: Room : 1 x: 15.00 y: 2.50 z: 1.50 [m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination:: Nuclide Concentration
[pCi/m2]
FE-55 1.000E-10

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th BOF CORE MIX.bld
Evaluation Time: 0.00000000E+00 years

Source: 3
Location:: Room : 1 x: 7.50 y: 0.00 z: 1.50 [m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	FE-55	1.000E-10

Source: 4
Location:: Room : 1 x: 7.50 y: 5.00 z: 1.50 [m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	FE-55	1.000E-10

Source: 5
Location:: Room : 1 x: 7.50 y: 2.50 z: 0.00 [m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	PU-241	2.490E+00
	AM-241	2.900E-01

Evaluation Time: 0.00000000E+00 years

PU-239	6.000E-02
PU-238	7.000E-02
NP-237	0.000E+00
U-238	9.700E-01
U-235	9.000E-02
U-234	9.800E-01
U-233	0.000E+00
PA-231	0.000E+00
TH-230	0.000E+00
TH-229	0.000E+00
AC-227	0.000E+00
RA-226	0.000E+00
PB-210	0.000E+00
SR-90	1.170E+01
NI-63	1.970E+01
FE-55	1.890E+01

Source: 6
Location:: Room : 1 x: 7.50 y: 2.50 z: 3.00 [m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	FE-55	1.000E-10

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Flum Brook 25th BOP CORE MIX.bld
Evaluation Time: 0.00000000E+00 years

RESRAD-BUILDDose Tables

Source Contributions to Receptor Doses

[mrem]

	Source 1	Source 2	Source 3	Source 4	Source 5	Source 6	Total
Receptor 1	7.68E-20	7.68E-20	2.30E-19	2.30E-19	4.00E-05	3.84E-19	4.00E-05
Total	7.68E-20	7.68E-20	2.30E-19	2.30E-19	4.00E-05	3.84E-19	4.00E-05

Title : Flumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Flum Brook 25th BOF CORE MIX.bld
Evaluation Time: 0.00000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	1.04E-21	0.00E+00	7.58E-20
Total	0.00E+00	0.00E+00	0.00E+00	1.04E-21	0.00E+00	7.58E-20

Source: 2

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	1.04E-21	0.00E+00	7.58E-20
Total	0.00E+00	0.00E+00	0.00E+00	1.04E-21	0.00E+00	7.58E-20

Source: 3

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	3.11E-21	0.00E+00	2.27E-19
Total	0.00E+00	0.00E+00	0.00E+00	3.11E-21	0.00E+00	2.27E-19

Source: 4

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	3.11E-21	0.00E+00	2.27E-19
Total	0.00E+00	0.00E+00	0.00E+00	3.11E-21	0.00E+00	2.27E-19

Source: 5

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.21E-06	1.56E-15	9.51E-13	1.03E-05	1.11E-21	2.84E-05
Total	1.21E-06	1.56E-15	9.51E-13	1.03E-05	1.11E-21	2.84E-05

Source: 6

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	5.19E-21	0.00E+00	3.79E-19
Total	0.00E+00	0.00E+00	0.00E+00	5.19E-21	0.00E+00	3.79E-19

Title : Flumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Flum Brook 25th BOF CORE MIX.bld
Evaluation Time: 0.00000000E+00 years

Nuclide Detail of Doses

(mrem)

Source: 1

Nuclide	Receptor 1	Total
FE-55		
FE-55	7.68E-20	7.68E-20

Source: 2

Nuclide	Receptor 1	Total
FE-55		
FE-55	7.68E-20	7.68E-20

: 3

Nuclide	Receptor 1	Total
FE-55		
FE-55	2.30E-19	2.30E-19

Source: 4

Nuclide	Receptor 1	Total
FE-55		
FE-55	2.30E-19	2.30E-19

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th BOP CORE MIX.bld
Evaluation Time: 0.00000000E+00 years

Source: 5

Nuclide	Receptor 1	Total
PU-241		
PU-241	1.62E-06	1.62E-06
AM-241	7.04E-08	7.04E-08
NP-237	9.66E-15	9.66E-15
U-233	1.17E-21	1.17E-21
TH-229	3.49E-25	3.49E-25
AM-241		
AM-241	1.04E-05	1.04E-05
NP-237	2.13E-12	2.13E-12
U-233	3.42E-19	3.42E-19
TH-229	1.27E-22	1.27E-22
PU-239		
PU-239	2.07E-06	2.07E-06
U-235	1.84E-16	1.84E-16
PA-231	2.15E-20	2.15E-20
AC-227	4.20E-22	4.20E-22
PU-238		
PU-238	2.18E-06	2.18E-06
U-234	4.85E-13	4.85E-13
TH-230	3.27E-18	3.27E-18
RA-226	6.13E-22	6.13E-22
PB-210	7.61E-24	7.61E-24
U-238		
U-238	4.66E-06	4.66E-06
U-234	6.74E-12	6.74E-12
TH-230	4.54E-17	4.54E-17
RA-226	1.13E-20	1.13E-20
PB-210	1.06E-22	1.06E-22
U-235		
U-235	5.62E-07	5.62E-07
PA-231	9.82E-11	9.82E-11
AC-227	2.56E-12	2.56E-12
U-234		
U-234	4.81E-06	4.81E-06
TH-230	4.86E-11	4.86E-11
RA-226	1.61E-14	1.61E-14
PB-210	1.87E-16	1.87E-16
SR-90		
SR-90	1.35E-05	1.35E-05
NI-63		
NI-63	8.28E-08	8.28E-08
FE-55		
FE-55	7.26E-08	7.26E-08

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th BOF CORE MIX.bld
Evaluation Time: 0.00000000E+00 years

Source: 6

Nuclide	Receptor 1	Total
FE-55		
FE-55	3.84E-19	3.84E-19

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th BOP CORE MIX.bld
Dose Summary

RESRAD-BUILD Dose (Time) Tables

Receptor Dose Received for the Exposure Duration

(mrem)

	Evaluation Time [yr] 0.00E+00
1	4.00E-05

Receptor Dose/Yr Averaged Over Exposure Duration

(mrem/yr)

	Evaluation Time [yr] 0.00E+00
1	4.00E-05

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th BOP CORE MIX.bld

RESRAD-BUILD Table of Contents

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th BOF CORE MIX.bld

RESRAD-BUILD Input Parameters

Number of Sources : 6
Number of Receptors: 1
Total Time : 3.652500E+02 days
Fraction Inside : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	7.500	2.500	1.000	1.000	3.36E+01	0.00E+00

Receptor-Source Shielding Relationship

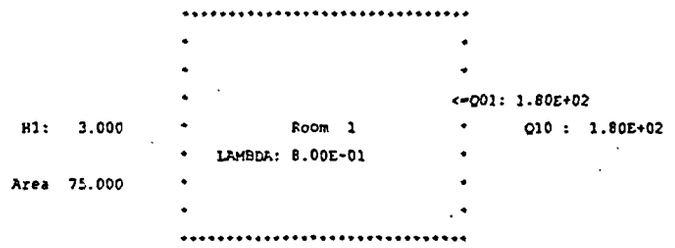
Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete
1	2	2.40E+00	0.00E+00	Concrete
1	3	2.40E+00	0.00E+00	Concrete
1	4	2.40E+00	0.00E+00	Concrete
1	5	2.40E+00	0.00E+00	Concrete
1	6	2.40E+00	0.00E+00	Concrete

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Flum Erook 75th BOP CORE MIX.bld

-------- Building Information --------

Building Air Exchange Rate: 8.00E-01 1/hr

Height[m] Air Exchanges [m3/hr]
Area [m2]



Deposition velocity: 2.70E-06 [m/s] Resuspension Rate: 1.40E-05 [1/s]

======== Source Information ========

Source: 1

Location:: Room : 1 x: 0.00 y: 2.50 z: 1.50[m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
EU-154	1.000E-10	9.550E-06	2.860E-04	7.180E-03

Source: 2

Location:: Room : 1 x: 15.00 y: 2.50 z: 1.50[m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
EU-154	1.000E-10	9.550E-06	2.860E-04	7.180E-03

Source: 3
Location:: Room : 1 x: 7.50 y: 0.00 z: 1.50[m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
EU-154	1.000E-10	9.550E-06	2.860E-04	7.180E-03

Source: 4
Location:: Room : 1 x: 7.50 y: 5.00 z: 1.50[m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
EU-154	1.000E-10	9.550E-06	2.860E-04	7.180E-03

Source: 5

Location:: Room : 1 x: 7.50 y: 2.50 z: 0.00[m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
CS-137	3.480E+01	5.000E-05	3.190E-05	3.190E-03
CO-60	1.230E+00	2.690E-05	2.190E-04	1.470E-02

Source: 6

Location:: Room : 1 x: 7.50 y: 2.50 z: 3.00[m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
EU-154	1.000E-10	9.550E-06	2.860E-04	7.180E-03

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th BOF CORE MIX.bld
Evaluation Time: 0.00000000E+00 years

==========
==========
=== Assessment for Time: 1 ===
=== Time =0.00E+00 yr ===
==========
==========

======== Source Information ========

Source: 1
Location:: Room : 1 x: 0.00 y: 2.50 z: 1.50 [m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination:: Nuclide Concentration
[pCi/m2]
EU-154 1.000E-10

Source: 2
Location:: Room : 1 x: 15.00 y: 2.50 z: 1.50 [m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination:: Nuclide Concentration
[pCi/m2]
EU-154 1.000E-10

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th BOP CORE MIX.bld
Evaluation Time: 0.00000000E+00 years

Source: 3
Location:: Room : 1 x: 7.50 y: 0.00 z: 1.50 [m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	EU-154	1.000E-10

Source: 4
Location:: Room : 1 x: 7.50 y: 5.00 z: 1.50 [m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	EU-154	1.000E-10

Source: 5
Location:: Room : 1 x: 7.50 y: 2.50 z: 0.00 [m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	CS-137	3.480E+01
	CO-60	1.230E+00

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th BOP CORE MIX.bld
Evaluation Time: 0.00000000E+00 years

Source: 6
Location:: Room : 1 x: 7.50 y: 2.50 z: 3.00 [m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	EU-154	1.000E-10

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th EOP CORE MIX.bld
Duration Time: 0.00000000E+00 years

RESRAD-BUILDDose Tables

Source Contributions to Receptor Doses

[mrem]

	Source 1	Source 2	Source 3	Source 4	Source 5	Source 6	Total
Receptor 1	1.29E-16	1.29E-16	1.88E-15	1.88E-15	2.19E-04	3.09E-15	2.19E-04
Total	1.29E-16	1.29E-16	1.88E-15	1.88E-15	2.19E-04	3.09E-15	2.19E-04

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th BOP CORE MIX.bld
Duration Time: 0.00000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.28E-16	4.55E-25	8.52E-23	4.16E-20	0.00E+00	1.31E-18
Total	1.28E-16	4.55E-25	8.52E-23	4.16E-20	0.00E+00	1.31E-18

Source: 2

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.28E-16	4.55E-25	8.52E-23	4.16E-20	0.00E+00	1.31E-18
Total	1.28E-16	4.55E-25	8.52E-23	4.16E-20	0.00E+00	1.31E-18

Source: 3

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.88E-15	1.36E-24	2.56E-22	1.25E-19	0.00E+00	3.92E-18
Total	1.88E-15	1.36E-24	2.56E-22	1.25E-19	0.00E+00	3.92E-18

Source: 4

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.88E-15	1.36E-24	2.56E-22	1.25E-19	0.00E+00	3.92E-18
Total	1.88E-15	1.36E-24	2.56E-22	1.25E-19	0.00E+00	3.92E-18

Source: 5

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	2.07E-04	9.20E-14	7.81E-11	1.02E-08	0.00E+00	1.25E-05
Total	2.07E-04	9.20E-14	7.81E-11	1.02E-08	0.00E+00	1.25E-05

Source: 6

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	3.09E-15	2.27E-24	4.26E-22	2.08E-19	0.00E+00	6.54E-18
Total	3.09E-15	2.27E-24	4.26E-22	2.08E-19	0.00E+00	6.54E-18

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th EOF CORE MIX.bld
Evaluation Time: 0.00000000E+00 years

Nuclide Detail of Doses
[mrem]

Source: 1

Nuclide	Receptor 1	Total
EU-154		
EU-154	1.29E-16	1.29E-16

Source: 2

Nuclide	Receptor 1	Total
EU-154		
EU-154	1.29E-16	1.29E-16

Source: 3

Nuclide	Receptor 1	Total
EU-154		
EU-154	1.88E-15	1.88E-15

Source: 4

Nuclide	Receptor 1	Total
EU-154		
EU-154	1.88E-15	1.88E-15

Title : Flumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Flum Brook 75th BOP CORE MIX.bld
Evaluation Time: 0.00000000E+00 years

Source: 5

Nuclide	Receptor 1	Total
CS-137		
CS-137	1.94E-04	1.94E-04
CO-60		
CO-60	2.57E-05	2.57E-05

Source: 6

Nuclide	Receptor 1	Total
EU-154		
EU-154	3.09E-15	3.09E-15

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th BOF CORE MIX.bld

Summary

RESRAD-BUILD Dose (Time) Tables

Receptor Dose Received for the Exposure Duration

(mrem)

	Evaluation Time [yr] 0.00E+00
1	2.19E-04

Receptor Dose/Yr Averaged Over Exposure Duration

(mrem/yr)

	Evaluation Time [yr] 0.00E+00
1	2.19E-04

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 BOP CORE MIX.bld

RESRAD-BUILD Table of Contents

Title : Flumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Flum Brook H-3 BOP CORE MIX.bld

RESRAD-BUILD Input Parameters

Number of Sources : 6
Number of Receptors: 1
Total Time : 3.652500E+02 days
Fraction Inside : 2.670000E-01

Receptor Information

Receptor	Room	x (m)	y (m)	z (m)	FracTime	Inhalation (m3/day)	Ingestion(Dust) (m2/hr)
1	1	7.500	2.500	1.000	1.000	3.36E+01	0.00E+00

Receptor-Source Shielding Relationship

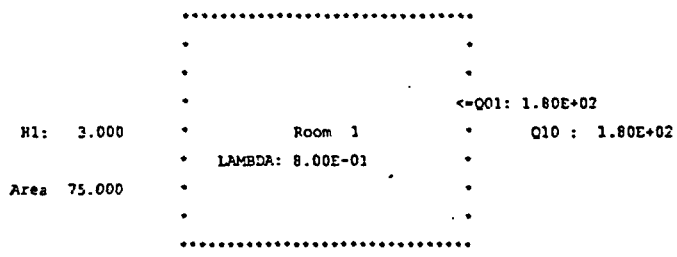
Receptor	Source	Density (g/cm3)	Thickness (cm)	Material
1	1	2.40E+00	0.00E+00	Concrete
1	2	2.40E+00	0.00E+00	Concrete
1	3	2.40E+00	0.00E+00	Concrete
1	4	2.40E+00	0.00E+00	Concrete
1	5	2.40E+00	0.00E+00	Concrete
1	6	2.40E+00	0.00E+00	Concrete

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 BOF CORE MIX.bld

======== Building Information ========

Building Air Exchange Rate: 8.00E-01 1/hr

Height[m] Air Exchanges [m3/hr]
Area [m2]



Deposition velocity: 2.70E-06 [m/s] Resuspension Rate: 1.40E-05 [1/s]

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 BOF CORE MIX.bld

-------- Source Information --------

Source: 1
Location:: Room : 1 x: 0.00 y: 2.50 z: 1.50[m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration [pCi/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/(pCi/m3)]
H-3	1.000E-10	6.400E-08	6.400E-08	0.000E+00

Source: 2
Location:: Room : 1 x: 15.00 y: 2.50 z: 1.50[m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration [pCi/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/(pCi/m3)]
H-3	1.000E-10	6.400E-08	6.400E-08	0.000E+00

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 BOP CORE MIX.bld

Source: 3
Location:: Room : 1 x: 7.50 y: 0.00 z: 1.50[m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
H-3	1.000E-10	6.400E-08	6.400E-08	0.000E+00

Source: 4
Location:: Room : 1 x: 7.50 y: 5.00 z: 1.50[m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
H-3	1.000E-10	6.400E-08	6.400E-08	0.000E+00

Source: 5

Location:: Room : 1 x: 7.50 y: 2.50 z: 0.00[m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
H-3	8.460E+00	6.400E-08	6.400E-08	0.000E+00

Source: 6

Location:: Room : 1 x: 7.50 y: 2.50 z: 3.00[m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
H-3	1.000E-10	6.400E-08	6.400E-08	0.000E+00

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 BOP CORE MIX.bld
Calculation Time: 0.00000000E+00 years

--- Assessment for Time: 1 ---
--- Time =0.00E+00 yr ---

******** Source Information ********

Source: 1
Location:: Room : 1 x: 0.00 y: 2.50 z: 1.50 [m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	H-3	1.000E-10

Source: 2
Location:: Room : 1 x: 15.00 y: 2.50 z: 1.50 [m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	H-3	1.000E-10

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 BOP CORE MIX.bld
Evaluation Time: 0.00000000E+00 years

Source: 3
Location:: Room : 1 x: 7.50 y: 0.00 z: 1.50 [m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	H-3	1.000E-10

Source: 4
Location:: Room : 1 x: 7.50 y: 5.00 z: 1.50 [m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	H-3	1.000E-10

Source: 5
Location:: Room : 1 x: 7.50 y: 2.50 z: 0.00 [m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	H-3	8.460E+00

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 BOP CORE MIX.bld
Simulation Time: 0.00000000E+00 years

Source: 6
Location:: Room : 1 x: 7.50 y: 2.50 z: 3.00 [m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	H-3	1.000E-10

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 BOP CORE MIX.bld
Calculation Time: 0.00000000E+00 years

RESRAD-BUILDDose Tables

Source Contributions to Receptor Doses

[mrem]

	Source 1	Source 2	Source 3	Source 4	Source 5	Source 6	Total
Receptor 1	9.39E-21	9.39E-21	2.62E-20	2.62E-20	3.97E-09	4.69E-20	3.97E-09
Total	9.39E-21	9.39E-21	2.62E-20	2.62E-20	3.97E-09	4.69E-20	3.97E-09

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 BOP CORE MIX.bld
Calculation Time: 0.00000000E+00 years

Pathway Detail of Doses

(mrem)

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	5.84E-22	0.00E+00	8.80E-21
Total	0.00E+00	0.00E+00	0.00E+00	5.84E-22	0.00E+00	8.80E-21

Source: 2

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	5.84E-22	0.00E+00	8.80E-21
Total	0.00E+00	0.00E+00	0.00E+00	5.84E-22	0.00E+00	8.80E-21

Source: 3

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	1.75E-21	0.00E+00	2.64E-20
Total	0.00E+00	0.00E+00	0.00E+00	1.75E-21	0.00E+00	2.64E-20

Source: 4

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	1.75E-21	0.00E+00	2.64E-20
Total	0.00E+00	0.00E+00	0.00E+00	1.75E-21	0.00E+00	2.64E-20

Source: 5

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	2.47E-10	0.00E+00	3.72E-09
Total	0.00E+00	0.00E+00	0.00E+00	2.47E-10	0.00E+00	3.72E-09

Source: 6

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	2.92E-21	0.00E+00	4.40E-20
Total	0.00E+00	0.00E+00	0.00E+00	2.92E-21	0.00E+00	4.40E-20

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 BOP CORE MIX.bld
Calculation Time: 0.00000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor 1	Total
H-3		
H-3	9.39E-21	9.39E-21

Source: 2

Nuclide	Receptor 1	Total
H-3		
H-3	9.39E-21	9.39E-21

Source: 3

Nuclide	Receptor 1	Total
H-3		
H-3	2.82E-20	2.82E-20

Source: 4

Nuclide	Receptor 1	Total
H-3		
H-3	2.82E-20	2.82E-20

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 BOP CORE MIX.bld
Calculation Time: 0.00000000E+00 years

Source: 5

Nuclide	Receptor 1	Total
H-3		
H-3	3.97E-09	3.97E-09

Source: 6

Nuclide	Receptor 1	Total
H-3		
H-3	4.69E-20	4.69E-20

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 BOP CORE MIX.bld
Summary

RESRAD-BUILD Dose (Time) Tables

Receptor Dose Received for the Exposure Duration

(mrem)

	Evaluation Time [yr] 0.00E+00
1	3.97E-09

Receptor Dose/Yr Averaged Over Exposure Duration

(mrem/yr)

	Evaluation Time [yr] 0.00E+00
1	3.97E-09

Summary : RESRAD Default Parameters
File : Plumbrook Subsurface Modified BOP CORE MIX.RAD

Table of Contents

Part I: Mixture Sums and Single Radionuclide Guidelines

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

Menu	Parameter	Current Value	Default	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	6.720E+00	6.720E+00	DCF2(1)
B-1	Ag-108m+D	2.830E-04	2.830E-04	DCF2(2)
B-1	Am-241	4.440E-01	4.440E-01	DCF2(3)
B-1	Am-243+D	4.400E-01	4.400E-01	DCF2(4)
B-1	C-14	2.090E-06	2.090E-06	DCF2(5)
B-1	Cm-243	3.070E-01	3.070E-01	DCF2(6)
B-1	Cm-245	4.550E-01	4.550E-01	DCF2(8)
B-1	Co-60	2.190E-04	2.190E-04	DCF2(10)
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2(11)
B-1	Eu-152	2.210E-04	2.210E-04	DCF2(12)
B-1	Eu-154	2.860E-04	2.860E-04	DCF2(14)
B-1	Eu-155	4.140E-05	4.140E-05	DCF2(15)
B-1	Fe-55	2.690E-06	2.690E-06	DCF2(16)
B-1	Gd-152	2.430E-01	2.430E-01	DCF2(17)
B-1	H-3	6.400E-08	6.400E-08	DCF2(18)
B-1	I-129	1.740E-04	1.740E-04	DCF2(19)
B-1	Na-22	7.660E-06	7.660E-06	DCF2(20)
B-1	Nb-94	4.140E-04	4.140E-04	DCF2(21)
B-1	Ni-59	2.700E-06	2.700E-06	DCF2(22)
B-1	Ni-63	6.290E-06	6.290E-06	DCF2(23)
B-1	Np-237+D	5.400E-01	5.400E-01	DCF2(24)
B-1	Pa-231	1.280E+00	1.280E+00	DCF2(25)
B-1	Pb-210+D	2.320E-02	2.320E-02	DCF2(26)
B-1	Pu-238	3.920E-01	3.920E-01	DCF2(27)
B-1	Pu-239	4.290E-01	4.290E-01	DCF2(28)
B-1	Pu-241+D	8.250E-03	8.250E-03	DCF2(29)
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF2(31)
B-1	Sb-125+D	1.386E-05	1.386E-05	DCF2(32)
B-1	Sr-90+D	1.310E-03	1.310E-03	DCF2(33)
B-1	Tc-99	8.330E-06	8.330E-06	DCF2(34)
B-1	Th-229+D	2.160E+00	2.160E+00	DCF2(35)
B-1	Th-230	3.260E-01	3.260E-01	DCF2(36)
B-1	U-233	1.350E-01	1.350E-01	DCF2(37)
B-1	U-234	1.320E-01	1.320E-01	DCF2(38)
B-1	U-235+D	1.230E-01	1.230E-01	DCF2(39)
B-1	U-238+D	1.180E-01	1.180E-01	DCF2(40)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	1.480E-02	1.480E-02	DCF3(1)
D-1	Ag-108m+D	7.620E-06	7.620E-06	DCF3(2)
D-1	Am-241	3.640E-03	3.640E-03	DCF3(3)
D-1	Am-243+D	3.630E-03	3.630E-03	DCF3(4)
D-1	C-14	2.090E-06	2.090E-06	DCF3(5)
D-1	Cm-243	2.510E-03	2.510E-03	DCF3(6)
D-1	Cm-245	3.740E-03	3.740E-03	DCF3(8)
D-1	Co-60	2.690E-05	2.690E-05	DCF3(10)
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3(11)
D-1	Eu-152	6.480E-06	6.480E-06	DCF3(12)
D-1	Eu-154	9.550E-06	9.550E-06	DCF3(14)

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

Menu	Parameter	Current Value	Default	Parameter Name
D-1	Eu-155	1.530E-06	1.530E-06	DCF3(15)
D-1	Fe-55	6.070E-07	6.070E-07	DCF3(16)
D-1	Gd-152	1.610E-04	1.610E-04	DCF3(17)
D-1	H-3	6.400E-08	6.400E-08	DCF3(18)
D-1	I-129	2.760E-04	2.760E-04	DCF3(19)
D-1	Na-22	1.150E-05	1.150E-05	DCF3(20)
D-1	Nb-94	7.140E-06	7.140E-06	DCF3(21)
D-1	Ni-59	2.100E-07	2.100E-07	DCF3(22)
D-1	Ni-63	5.770E-07	5.770E-07	DCF3(23)
D-1	Np-237+D	4.440E-03	4.440E-03	DCF3(24)
D-1	Pa-231	1.060E-02	1.060E-02	DCF3(25)
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF3(26)
D-1	Pu-238	3.200E-03	3.200E-03	DCF3(27)
D-1	Pu-239	3.540E-03	3.540E-03	DCF3(28)
D-1	Pu-241+D	6.850E-05	6.850E-05	DCF3(29)
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF3(31)
D-1	Sb-125+D	3.647E-06	3.647E-06	DCF3(32)
D-1	Sr-90+D	1.530E-04	1.530E-04	DCF3(33)
D-1	Tc-99	1.460E-06	1.460E-06	DCF3(34)
D-1	Th-229+D	4.030E-03	4.030E-03	DCF3(35)
D	Th-230	5.480E-04	5.480E-04	DCF3(36)
D	U-233	2.890E-04	2.890E-04	DCF3(37)
D-1	U-234	2.830E-04	2.830E-04	DCF3(38)
D-1	U-235+D	2.670E-04	2.670E-04	DCF3(39)
D-1	U-238+D	2.690E-04	2.690E-04	DCF3(40)
D-34	Food transfer factors:			
D-34	Ac-227+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(1,1)
D-34	Ac-227+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,2)
D-34	Ac-227+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,3)
D-34				
D-34	Ag-108m+D, plant/soil concentration ratio, dimensionless	1.500E-01	1.500E-01	RTF(2,1)
D-34	Ag-108m+D, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-03	3.000E-03	RTF(2,2)
D-34	Ag-108m+D, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.500E-02	2.500E-02	RTF(2,3)
D-34				
D-34	Am-241 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(3,1)
D-34	Am-241 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-05	5.000E-05	RTF(3,2)
D-34	Am-241 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(3,3)
D-34				
D-34	Am-243+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(4,1)
D-34	Am-243+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-05	5.000E-05	RTF(4,2)
D-34	Am-243+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(4,3)
D-34				
D-34	C-14 , plant/soil concentration ratio, dimensionless	5.500E+00	5.500E+00	RTF(5,1)
D-34	C-14 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.100E-02	3.100E-02	RTF(5,2)
D-34	C-14 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.200E-02	1.200E-02	RTF(5,3)
D-34	Cm-243 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(6,1)
D-34	Cm-243 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(6,2)
D-34	Cm-243 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(6,3)

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

Menu	Parameter	Current Value	Default	Parameter Name
D-34	Cm-245 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(8,1)
D-34	Cm-245 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(8,2)
D-34	Cm-245 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(8,3)
D-34				
D-34	Co-60 , plant/soil concentration ratio, dimensionless	8.000E-02	8.000E-02	RTF(10,1)
D-34	Co-60 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-02	2.000E-02	RTF(10,2)
D-34	Co-60 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(10,3)
D-34				
D-34	Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(11,1)
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(11,2)
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(11,3)
D-34				
D-34	Eu-152 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(12,1)
D-34	Eu-152 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(12,2)
D-34	Eu-152 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(12,3)
D-34				
D-34	Eu-154 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(14,1)
D-34	Eu-154 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(14,2)
D-34	Eu-154 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(14,3)
D-34				
D-34	Eu-155 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(15,1)
D-34	Eu-155 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(15,2)
D-34	Eu-155 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(15,3)
D-34				
D-34	Fe-55 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(16,1)
D-34	Fe-55 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-02	2.000E-02	RTF(16,2)
D-34	Fe-55 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(16,3)
D-34				
D-34	Gd-152 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(17,1)
D-34	Gd-152 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(17,2)
D-34	Gd-152 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(17,3)
D-34				
D-34	H-3 , plant/soil concentration ratio, dimensionless	4.800E+00	4.800E+00	RTF(18,1)
D-34	H-3 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.200E-02	1.200E-02	RTF(18,2)
D-34	H-3 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-02	1.000E-02	RTF(18,3)
D-34				
D-34	I-129 , plant/soil concentration ratio, dimensionless	2.000E-02	2.000E-02	RTF(19,1)
D-34	I-129 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	7.000E-03	7.000E-03	RTF(19,2)
D-34	I-129 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-02	1.000E-02	RTF(19,3)
D-34				
D-34	Na-22 , plant/soil concentration ratio, dimensionless	5.000E-02	5.000E-02	RTF(20,1)
D-34	Na-22 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-02	8.000E-02	RTF(20,2)
D-34	Na-22 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	4.000E-02	4.000E-02	RTF(20,3)
D-34				
D-34	Nb-94 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(21,1)
D-34	Nb-94 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-07	3.000E-07	RTF(21,2)
D-34	Nb-94 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(21,3)
D-34				

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

Menu	Parameter	Current Value	Default	Parameter Name
D-34	Ni-59 , plant/soil concentration ratio, dimensionless	5.000E-02	5.000E-02	RTF(22,1)
D-34	Ni-59 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(22,2)
D-34	Ni-59 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-02	2.000E-02	RTF(22,3)
D-34				
D-34	Ni-63 , plant/soil concentration ratio, dimensionless	5.000E-02	5.000E-02	RTF(23,1)
D-34	Ni-63 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(23,2)
D-34	Ni-63 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-02	2.000E-02	RTF(23,3)
D-34				
D-34	Np-237+D , plant/soil concentration ratio, dimensionless	2.000E-02	2.000E-02	RTF(24,1)
D-34	Np-237+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(24,2)
D-34	Np-237+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(24,3)
D-34				
D-34	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(25,1)
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(25,2)
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(25,3)
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(26,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(26,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(26,3)
D-34				
	Pu-238 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(27,1)
D-34	Pu-238 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(27,2)
D-34	Pu-238 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(27,3)
D-34				
D-34	Pu-239 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(28,1)
D-34	Pu-239 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(28,2)
D-34	Pu-239 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(28,3)
D-34				
D-34	Pu-241+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(29,1)
D-34	Pu-241+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(29,2)
D-34	Pu-241+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(29,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(31,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(31,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(31,3)
D-34				
D-34	Sb-125+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(32,1)
D-34	Sb-125+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(32,2)
D-34	Sb-125+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-04	1.000E-04	RTF(32,3)
D-34				
D-34	Sr-90+D , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF(33,1)
D-34	Sr-90+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-03	8.000E-03	RTF(33,2)
D-34	Sr-90+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(33,3)
D-34				
D-34	Tc-99 , plant/soil concentration ratio, dimensionless	5.000E+00	5.000E+00	RTF(34,1)
	Tc-99 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(34,2)
	Tc-99 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(34,3)
D-34				

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

Menu	Parameter	Current Value	Default	Parameter Name
D-34	Th-229+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(35,1)
D-34	Th-229+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(35,2)
D-34	Th-229+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(35,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(36,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(36,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(36,3)
D-34				
D-34	U-233 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(37,1)
D-34	U-233 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(37,2)
D-34	U-233 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(37,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(38,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(38,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(38,3)
D-34				
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(39,1)
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(39,2)
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(39,3)
D-34				
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(40,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(40,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(40,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Ac-227+D , fish	1.500E+01	1.500E+01	BIOFAC(1,1)
D-5	Ac-227+D , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(1,2)
D-5				
D-5	Ag-108m+D, fish	5.000E+00	5.000E+00	BIOFAC(2,1)
D-5	Ag-108m+D, crustacea and mollusks	7.700E+02	7.700E+02	BIOFAC(2,2)
D-5				
D-5	Am-241 , fish	3.000E+01	3.000E+01	BIOFAC(3,1)
D-5	Am-241 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(3,2)
D-5				
D-5	Am-243+D , fish	3.000E+01	3.000E+01	BIOFAC(4,1)
D-5	Am-243+D , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(4,2)
D-5				
D-5	C-14 , fish	5.000E+04	5.000E+04	BIOFAC(5,1)
D-5	C-14 , crustacea and mollusks	9.100E+03	9.100E+03	BIOFAC(5,2)
D-5				
D-5	Cm-243 , fish	3.000E+01	3.000E+01	BIOFAC(6,1)
D-5	Cm-243 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(6,2)
D-5				
D-5	Cm-245 , fish	3.000E+01	3.000E+01	BIOFAC(8,1)
D-5	Cm-245 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(8,2)
D-5	Co-60 , fish	3.000E+02	3.000E+02	BIOFAC(10,1)
D-5	Co-60 , crustacea and mollusks	2.000E+02	2.000E+02	BIOFAC(10,2)
D-5				

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

Menu	Parameter	Current Value	Default	Parameter Name
D-5	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC(11,1)
D-5	Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(11,2)
D-5				
D-5	Eu-152 , fish	5.000E+01	5.000E+01	BIOFAC(12,1)
D-5	Eu-152 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(12,2)
D-5				
D-5	Eu-154 , fish	5.000E+01	5.000E+01	BIOFAC(14,1)
D-5	Eu-154 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(14,2)
D-5				
D-5	Eu-155 , fish	5.000E+01	5.000E+01	BIOFAC(15,1)
D-5	Eu-155 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(15,2)
D-5				
D-5	Fe-55 , fish	2.000E+02	2.000E+02	BIOFAC(16,1)
D-5	Fe-55 , crustacea and mollusks	3.200E+03	3.200E+03	BIOFAC(16,2)
D-5				
D-5	Gd-152 , fish	2.500E+01	2.500E+01	BIOFAC(17,1)
D-5	Gd-152 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(17,2)
D-5				
D-5	H-3 , fish	1.000E+00	1.000E+00	BIOFAC(18,1)
D-5	H-3 , crustacea and mollusks	1.000E+00	1.000E+00	BIOFAC(18,2)
D-5				
D-5	I-129 , fish	4.000E+01	4.000E+01	BIOFAC(19,1)
D-5	I-129 , crustacea and mollusks	5.000E+00	5.000E+00	BIOFAC(19,2)
D-5				
D-5	Na-22 , fish	2.000E+01	2.000E+01	BIOFAC(20,1)
D-5	Na-22 , crustacea and mollusks	2.000E+02	2.000E+02	BIOFAC(20,2)
D-5				
D-5	Nb-94 , fish	3.000E+02	3.000E+02	BIOFAC(21,1)
D-5	Nb-94 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(21,2)
D-5				
D-5	Ni-59 , fish	1.000E+02	1.000E+02	BIOFAC(22,1)
D-5	Ni-59 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(22,2)
D-5				
D-5	Ni-63 , fish	1.000E+02	1.000E+02	BIOFAC(23,1)
D-5	Ni-63 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(23,2)
D-5				
D-5	Np-237+D , fish	3.000E+01	3.000E+01	BIOFAC(24,1)
D-5	Np-237+D , crustacea and mollusks	4.000E+02	4.000E+02	BIOFAC(24,2)
D-5				
D-5	Pa-231 , fish	1.000E+01	1.000E+01	BIOFAC(25,1)
D-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(25,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(26,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(26,2)
D-5				
D-5	Pu-238 , fish	3.000E+01	3.000E+01	BIOFAC(27,1)
D-5	Pu-238 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(27,2)
D-5				
D-5	Pu-239 , fish	3.000E+01	3.000E+01	BIOFAC(28,1)
D-5	Pu-239 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(28,2)

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

Menu	Parameter	Current Value	Default	Parameter Name
D-5	Pu-241+D , fish	3.000E+01	3.000E+01	BIOFAC(29,1)
D-5	Pu-241+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(29,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(31,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(31,2)
D-5				
D-5	Sb-125+D , fish	1.000E+02	1.000E+02	BIOFAC(32,1)
D-5	Sb-125+D , crustacea and mollusks	1.000E+01	1.000E+01	BIOFAC(32,2)
D-5				
D-5	Sr-90+D , fish	6.000E+01	6.000E+01	BIOFAC(33,1)
D-5	Sr-90+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(33,2)
D-5				
D-5	Tc-99 , fish	2.000E+01	2.000E+01	BIOFAC(34,1)
D-5	Tc-99 , crustacea and mollusks	5.000E+00	5.000E+00	BIOFAC(34,2)
D-5				
D-5	Th-229+D , fish	1.000E+02	1.000E+02	BIOFAC(35,1)
D-5	Th-229+D , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(35,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(36,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(36,2)
D-5				
D-5	U-233 , fish	1.000E+01	1.000E+01	BIOFAC(37,1)
D-5	U-233 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(37,2)
D-5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(38,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(38,2)
D-5				
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIOFAC(39,1)
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(39,2)
D-5				
D-5	U-236+D , fish	1.000E+01	1.000E+01	BIOFAC(40,1)
D-5	U-236+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(40,2)

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)	3.850E+03	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	3.000E+00	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	7.000E+01	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	2.500E+01	---	BRDL
R011	Time since placement of material (yr)	1.000E+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): Am-241	2.900E-01	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): Cm-245	1.900E-01	0.000E+00	---	S1(8)
R012	Initial principal radionuclide (pCi/g): Co-60	1.230E+00	0.000E+00	---	S1(10)
R012	Initial principal radionuclide (pCi/g): Cs-137	3.479E+01	0.000E+00	---	S1(11)
R012	Initial principal radionuclide (pCi/g): Fe-55	1.893E+01	0.000E+00	---	S1(16)
R012	Initial principal radionuclide (pCi/g): H-3	8.460E+00	0.000E+00	---	S1(18)
R012	Initial principal radionuclide (pCi/g): Ni-63	1.971E+01	0.000E+00	---	S1(23)
R012	Initial principal radionuclide (pCi/g): Pu-238	7.000E-02	0.000E+00	---	S1(27)
R012	Initial principal radionuclide (pCi/g): Pu-239	6.000E-02	0.000E+00	---	S1(28)
R012	Initial principal radionuclide (pCi/g): Pu-241	2.490E+00	0.000E+00	---	S1(29)
R012	Initial principal radionuclide (pCi/g): Sr-90	1.174E+01	0.000E+00	---	S1(33)
R012	Initial principal radionuclide (pCi/g): U-234	9.800E-01	0.000E+00	---	S1(38)
R012	Initial principal radionuclide (pCi/g): U-235	9.000E-02	0.000E+00	---	S1(39)
R012	Initial principal radionuclide (pCi/g): U-238	9.700E-01	0.000E+00	---	S1(40)
R012	Concentration in groundwater (pCi/L): Am-241	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): Cm-245	not used	0.000E+00	---	W1(8)
R012	Concentration in groundwater (pCi/L): Co-60	not used	0.000E+00	---	W1(10)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	W1(11)
R012	Concentration in groundwater (pCi/L): Fe-55	not used	0.000E+00	---	W1(16)
R012	Concentration in groundwater (pCi/L): H-3	not used	0.000E+00	---	W1(18)
R012	Concentration in groundwater (pCi/L): Ni-63	not used	0.000E+00	---	W1(23)
R012	Concentration in groundwater (pCi/L): Pu-238	not used	0.000E+00	---	W1(27)
R012	Concentration in groundwater (pCi/L): Pu-239	not used	0.000E+00	---	W1(28)
R012	Concentration in groundwater (pCi/L): Pu-241	not used	0.000E+00	---	W1(29)
R012	Concentration in groundwater (pCi/L): Sr-90	not used	0.000E+00	---	W1(33)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(38)
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	---	W1(39)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(40)
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)	1.560E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.100E-01	4.000E-01	---	TPCZ

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	6.600E-01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	1.400E+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)	8.000E+00	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	8.600E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	1.040E+00	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)	1.000E+06	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	1.460E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	4.500E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	2.000E-01	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	2.000E-01	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	1.070E+03	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	4.500E-03	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	0.000E+00	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	2.010E+00	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	MB	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	1.180E+02	2.500E+02	---	UW
R015	Number of unsaturated zone strata	1	1	---	NS
R015	Unsat. zone 1, thickness (m)	0.000E+00	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.560E+00	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	4.100E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	3.000E-01	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	2.000E-01	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	1.400E+00	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	1.262E+03	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Am-241				
R016	Contaminated zone (cm**3/g)	4.450E+02	2.000E+01	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.146E-04	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for Cm-245				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCC(8)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU(8,1)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.340E-04	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Co-60				
R016	Contaminated zone (cm**3/g)	1.700E+01	1.000E+03	---	DCNUCC(10)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCU(10,1)
R016	Saturated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCS(10)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.069E-02	ALEACH(10)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(10)
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	6.500E+00	1.000E+03	---	DCNUCC(11)
R016	Unsaturated zone 1 (cm**3/g)	4.470E+02	1.000E+03	---	DCNUCU(11,1)
R016	Saturated zone (cm**3/g)	4.470E+02	1.000E+03	---	DCNUCS(11)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.730E-02	ALEACH(11)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(11)
R016	Distribution coefficients for Fe-55				
R016	Contaminated zone (cm**3/g)	1.300E+01	1.000E+03	---	DCNUCC(16)
R016	Unsaturated zone 1 (cm**3/g)	8.910E+02	1.000E+03	---	DCNUCU(16,1)
R016	Saturated zone (cm**3/g)	8.910E+02	1.000E+03	---	DCNUCS(16)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.392E-02	ALEACH(16)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(16)
R016	Distribution coefficients for H-3				
R016	Contaminated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCC(18)
R016	Unsaturated zone 1 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU(18,1)
R016	Saturated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCS(18)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.024E-01	ALEACH(18)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(18)
R016	Distribution coefficients for Ni-63				
R016	Contaminated zone (cm**3/g)	3.200E+01	1.000E+03	---	DCNUCC(23)
R016	Unsaturated zone 1 (cm**3/g)	3.700E+01	1.000E+03	---	DCNUCU(23,1)
R016	Saturated zone (cm**3/g)	3.700E+01	1.000E+03	---	DCNUCS(23)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.722E-03	ALEACH(23)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(23)
R016	Distribution coefficients for Pu-238				
R016	Contaminated zone (cm**3/g)	1.625E+03	2.000E+03	---	DCNUCC(27)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCU(27,1)
R016	Saturated zone (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCS(27)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.136E-04	ALEACH(27)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(27)
R016	Distribution coefficients for Pu-239				
R016	Contaminated zone (cm**3/g)	1.625E+03	2.000E+03	---	DCNUCC(28)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCU(28,1)
R016	Saturated zone (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCS(28)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.136E-04	ALEACH(28)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(28)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Pu-241				
R016	Contaminated zone (cm**3/g)	1.625E+03	2.000E+03	---	DCNUCC(29)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCU(29,1)
R016	Saturated zone (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCS(29)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.136E-04	ALEACH(29)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(29)
R016	Distribution coefficients for Sr-90				
R016	Contaminated zone (cm**3/g)	3.500E+00	3.000E+01	---	DCNUCC(33)
R016	Unsaturated zone 1 (cm**3/g)	3.200E+01	3.000E+01	---	DCNUCU(33,1)
R016	Saturated zone (cm**3/g)	3.200E+01	3.000E+01	---	DCNUCS(33)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.906E-02	ALEACH(33)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(33)
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	2.120E+02	5.000E+01	---	DCNUCC(38)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(38,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(38)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.697E-04	ALEACH(38)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(38)
R016	Distribution coefficients for U-235				
R016	Contaminated zone (cm**3/g)	2.120E+02	5.000E+01	---	DCNUCC(39)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(39,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(39)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.697E-04	ALEACH(39)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(39)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	2.120E+02	5.000E+01	---	DCNUCC(40)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(40,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(40)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.697E-04	ALEACH(40)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(40)
R016	Distribution coefficients for daughter Ac-227				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.111E-03	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for daughter Ag-108m				
R016	Contaminated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.024E-01	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for daughter Am-243				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(4)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.111E-03	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)
R016	Distribution coefficients for daughter C-14				
R016	Contaminated zone (cm**3/g)	2.600E+01	0.000E+00	---	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	2.100E+01	0.000E+00	---	DCNUCU(5,1)
R016	Saturated zone (cm**3/g)	2.100E+01	0.000E+00	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.030E-03	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R016	Distribution coefficients for daughter Cm-243				
R016	Contaminated zone (cm**3/g)	4.000E+02	-1.000E+00	---	DCNUCC(6)
R016	Unsaturated zone 1 (cm**3/g)	6.760E+03	-1.000E+00	---	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	6.760E+03	-1.000E+00	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.612E-04	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R016	Distribution coefficients for daughter Cm-243				
R016	Contaminated zone (cm**3/g)	4.000E+02	-1.000E+00	---	DCNUCC(7)
R016	Unsaturated zone 1 (cm**3/g)	6.760E+03	-1.000E+00	---	DCNUCU(7,1)
R016	Saturated zone (cm**3/g)	6.760E+03	-1.000E+00	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.612E-04	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for daughter Eu-152				
R016	Contaminated zone (cm**3/g)	4.000E+02	-1.000E+00	---	DCNUCC(12)
R016	Unsaturated zone 1 (cm**3/g)	9.550E+02	-1.000E+00	---	DCNUCU(12,1)
R016	Saturated zone (cm**3/g)	9.550E+02	-1.000E+00	---	DCNUCS(12)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.612E-04	ALEACH(12)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(12)
R016	Distribution coefficients for daughter Eu-152				
R016	Contaminated zone (cm**3/g)	4.000E+02	-1.000E+00	---	DCNUCC(13)
R016	Unsaturated zone 1 (cm**3/g)	9.550E+02	-1.000E+00	---	DCNUCU(13,1)
R016	Saturated zone (cm**3/g)	9.550E+02	-1.000E+00	---	DCNUCS(13)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.612E-04	ALEACH(13)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(13)
R016	Distribution coefficients for daughter Eu-154				
R016	Contaminated zone (cm**3/g)	4.000E+02	-1.000E+00	---	DCNUCC(14)
R016	Unsaturated zone 1 (cm**3/g)	9.550E+02	-1.000E+00	---	DCNUCU(14,1)
R016	Saturated zone (cm**3/g)	9.550E+02	-1.000E+00	---	DCNUCS(14)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.612E-04	ALEACH(14)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(14)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for daughter Eu-155				
R016	Contaminated zone (cm**3/g)	4.000E+02	-1.000E+00	---	DCNUCC(15)
R016	Unsaturated zone 1 (cm**3/g)	9.550E+02	-1.000E+00	---	DCNUCU(15,1)
R016	Saturated zone (cm**3/g)	9.550E+02	-1.000E+00	---	DCNUCS(15)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.612E-04	ALEACH(15)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(15)
R016	Distribution coefficients for daughter Gd-152				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCC(17)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU(17,1)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCS(17)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.237E-04	ALEACH(17)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(17)
R016	Distribution coefficients for daughter I-129				
R016	Contaminated zone (cm**3/g)	3.200E+00	1.000E-01	---	DCNUCC(19)
R016	Unsaturated zone 1 (cm**3/g)	1.000E-01	1.000E-01	---	DCNUCU(19,1)
R016	Saturated zone (cm**3/g)	1.000E-01	1.000E-01	---	DCNUCS(19)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.331E-02	ALEACH(19)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(19)
R016	Distribution coefficients for daughter Na-22				
R016	Contaminated zone (cm**3/g)	1.000E+01	1.000E+01	---	DCNUCC(20)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+01	1.000E+01	---	DCNUCU(20,1)
R016	Saturated zone (cm**3/g)	1.000E+01	1.000E+01	---	DCNUCS(20)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.799E-02	ALEACH(20)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(20)
R016	Distribution coefficients for daughter Nb-94				
R016	Contaminated zone (cm**3/g)	3.250E+02	0.000E+00	---	DCNUCC(21)
R016	Unsaturated zone 1 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU(21,1)
R016	Saturated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCS(21)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.676E-04	ALEACH(21)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(21)
R016	Distribution coefficients for daughter Ni-59				
R016	Contaminated zone (cm**3/g)	3.200E+01	1.000E+03	---	DCNUCC(22)
R016	Unsaturated zone 1 (cm**3/g)	3.700E+01	1.000E+03	---	DCNUCU(22,1)
R016	Saturated zone (cm**3/g)	3.700E+01	1.000E+03	---	DCNUCS(22)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.722E-03	ALEACH(22)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(22)
R016	Distribution coefficients for daughter Np-237				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCC(24)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCU(24,1)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCS(24)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.164E-04	ALEACH(24)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(24)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for daughter Pa-231				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(25)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(25,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(25)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.673E-03	ALEACH(25)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(25)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC(26)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCU(26,1)
R016	Saturated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCS(26)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.841E-03	ALEACH(26)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(26)
R016	Distribution coefficients for daughter Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(31)
R016	Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU(31,1)
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCS(31)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.627E-03	ALEACH(31)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(31)
R016	Distribution coefficients for daughter Sb-125				
R016	Contaminated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCC(32)
R016	Unsaturated zone 1 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU(32,1)
R016	Saturated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCS(32)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.024E-01	ALEACH(32)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(32)
R016	Distribution coefficients for daughter Tc-99				
R016	Contaminated zone (cm**3/g)	5.200E+00	0.000E+00	---	DCNUCC(34)
R016	Unsaturated zone 1 (cm**3/g)	7.000E+00	0.000E+00	---	DCNUCU(34,1)
R016	Saturated zone (cm**3/g)	7.000E+00	0.000E+00	---	DCNUCS(34)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.379E-02	ALEACH(34)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(34)
R016	Distribution coefficients for daughter Th-229				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(35)
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCU(35,1)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(35)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.077E-06	ALEACH(35)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(35)
R016	Distribution coefficients for daughter Th-230				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(36)
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCU(36,1)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(36)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.077E-06	ALEACH(36)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(36)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for daughter U-233				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(37)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(37,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(37)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.673E-03	ALEACH(37)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(37)
R017	Inhalation rate (m**3/yr)	8.400E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	6.000E-06	1.000E-04	---	MLINH
R017	Exposure duration	3.653E+02	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	4.700E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	6.600E-01	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	1.100E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS
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)	7.800E+01	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	1.500E+01	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	1.180E+02	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	5.200E+01	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	1.600E+01	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	0.000E+00	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	1.830E+01	3.650E+01	---	SOIL

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R018	Drinking water intake (L/yr)	4.780E+02	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	1.000E+00	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	1.000E+00	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	1.000E+00	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	5.000E-01	5.000E-01	---	FR9
R018	Contamination fraction of plant food	1.000E+00	-1	---	FPLANT
R018	Contamination fraction of meat	1.000E+00	-1	---	FMEAT
R018	Contamination fraction of milk	1.000E+00	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	8.500E+00	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	1.700E+01	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	5.000E+01	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	1.600E+02	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	5.000E-01	5.000E-01	---	LSI
R019	Mass loading for foliar deposition (g/m**3)	1.000E-04	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	9.000E-01	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	1.000E+00	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	1.000E+00	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	1.000E+00	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	7.000E-01	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	1.500E+00	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	1.100E+00	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	1.700E-01	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	2.500E-01	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	8.000E-02	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	1.000E-01	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	1.000E+00	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	1.000E+00	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	2.000E+01	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	2.000E-05	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	3.000E-02	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	2.000E-02	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	9.800E-01	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	3.000E-01	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	7.000E-07	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	1.000E-10	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	8.000E-01	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	2.000E-01	2.000E-01	---	AVFG5
C14	DCF correction factor for gaseous forms of C14	8.894E+01	8.894E+01	---	CO2F

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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
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	1	---	---	KYMAX

Summary of Pathway Selections

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

Summary : RESRAD Default Parameters
File : Plumbrook Subsurface Modified BOF CORE MIX.RAD

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	3850.00 square meters	Am-241	2.900E-01
Thickness:	3.00 meters	Cm-245	1.900E-01
Cover Depth:	0.00 meters	Co-60	1.230E+00
		Cs-137	3.479E+01
		Fe-55	1.893E+01
		H-3	8.460E+00
		Ni-63	1.971E+01
		Pu-238	7.000E-02
		Pu-239	6.000E-02
		Pu-241	2.490E+00
		Sr-90	1.174E+01
		U-234	9.800E-01
		U-235	9.000E-02
		U-238	9.700E-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):	8.692E+02	8.155E+02	7.187E+02	4.652E+02	1.421E+02	7.770E+00	3.934E+00	1.930E+00
M(t):	3.477E+01	3.262E+01	2.875E+01	1.861E+01	5.685E+00	3.108E-01	1.574E-01	7.720E-02

Maximum TDOSE(t): 8.692E+02 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-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	*mrem/yr*	*fract.*	*mrem/yr*	*fract.*	*mrem/yr*	*fract.*	*mrem/yr*	*fract.*	*mrem/yr*	*fract.*	*mrem/yr*	*fract.*	*mrem/yr*	*fract.*
Am-241	5.042E-03	0.0000	3.721E-04	0.0000	0.000E+00	0.0000	9.821E-02	0.0001	1.394E-03	0.0000	1.287E-04	0.0000	1.486E-02	0.0000
Cm-245	2.550E-02	0.0000	2.501E-04	0.0000	0.000E+00	0.0000	6.620E-02	0.0001	3.765E-04	0.0000	8.672E-05	0.0000	1.002E-02	0.0000
Co-60	7.180E+00	0.0083	7.263E-07	0.0000	0.000E+00	0.0000	2.295E-01	0.0003	3.789E-02	0.0000	1.355E-02	0.0000	4.346E-04	0.0000
Cs-137	4.441E+01	0.0511	3.131E-06	0.0000	0.000E+00	0.0000	6.316E+00	0.0073	2.228E+00	0.0026	1.893E+00	0.0022	2.390E-02	0.0000
Fe-55	0.000E+00	0.0000	1.290E-07	0.0000	0.000E+00	0.0000	9.378E-04	0.0000	5.328E-03	0.0000	1.843E-04	0.0000	1.419E-04	0.0000
H-3	0.000E+00	0.0000	2.231E-03	0.0000	0.000E+00	0.0000	8.330E-02	0.0001	4.971E-03	0.0000	1.015E-02	0.0000	4.008E-06	0.0000
Ni-63	0.000E+00	0.0000	3.563E-07	0.0000	0.000E+00	0.0000	5.255E-02	0.0001	2.719E-03	0.0000	3.602E-02	0.0000	1.592E-04	0.0000
Pu-238	4.347E-06	0.0000	7.905E-05	0.0000	0.000E+00	0.0000	2.078E-02	0.0000	5.900E-04	0.0000	1.361E-05	0.0000	3.144E-03	0.0000
Pu-239	7.027E-06	0.0000	7.445E-05	0.0000	0.000E+00	0.0000	1.978E-02	0.0000	5.616E-04	0.0000	1.296E-05	0.0000	2.993E-03	0.0000
Pu-241	5.231E-05	0.0000	6.053E-05	0.0000	0.000E+00	0.0000	1.617E-02	0.0000	4.507E-04	0.0000	1.103E-05	0.0000	2.447E-03	0.0000
Sr-90	1.076E-01	0.0001	4.290E-05	0.0000	0.000E+00	0.0000	4.840E+01	0.0557	2.213E+00	0.0025	2.300E+00	0.0026	2.441E-02	0.0000
U-234	1.573E-04	0.0000	3.740E-04	0.0000	0.000E+00	0.0000	6.449E-02	0.0001	2.555E-03	0.0000	1.065E-02	0.0000	3.906E-03	0.0000
U-235	2.674E-02	0.0000	3.201E-05	0.0000	0.000E+00	0.0000	5.597E-03	0.0000	2.227E-04	0.0000	9.227E-04	0.0000	3.386E-04	0.0000
U-238	5.716E-02	0.0001	3.309E-04	0.0000	0.000E+00	0.0000	6.067E-02	0.0001	2.404E-03	0.0000	1.002E-02	0.0000	3.675E-03	0.0000
Total	5.181E+01	0.0596	3.851E-03	0.0000	0.000E+00	0.0000	5.543E+01	0.0638	4.500E+00	0.0052	4.275E+00	0.0049	9.043E-02	0.0001

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-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	*mrem/yr*	*fract.*	*mrem/yr*	*fract.*	*mrem/yr*	*fract.*	*mrem/yr*	*fract.*	*mrem/yr*	*fract.*	*mrem/yr*	*fract.*	*mrem/yr*	*fract.*
Am-241	1.132E+00	0.0013	2.187E-03	0.0000	0.000E+00	0.0000	6.373E-01	0.0007	8.013E-04	0.0000	1.790E-04	0.0000	1.892E+00	0.0022
Cm-245	2.466E-01	0.0003	4.768E-04	0.0000	0.000E+00	0.0000	1.389E-01	0.0002	7.018E-05	0.0000	3.899E-05	0.0000	4.886E-01	0.0006
Co-60	8.541E-01	0.0010	1.651E-02	0.0000	0.000E+00	0.0000	4.894E-01	0.0006	2.425E-01	0.0003	1.353E-01	0.0002	9.199E+00	0.0106
Cs-137	1.200E+02	0.1381	1.547E+01	0.0178	0.000E+00	0.0000	6.820E+01	0.0785	5.118E+01	0.0589	7.609E+01	0.0875	3.858E+02	0.4439
Fe-55	3.629E-01	0.0004	4.678E-03	0.0000	0.000E+00	0.0000	2.044E-01	0.0002	1.029E-01	0.0001	8.617E-03	0.0000	6.902E-01	0.0008
H-3	2.756E-01	0.0003	1.807E-05	0.0000	0.000E+00	0.0000	1.334E-01	0.0002	2.031E-02	0.0000	6.263E-02	0.0001	5.926E-01	0.0007
Ni-63	1.674E-01	0.0002	1.079E-03	0.0000	0.000E+00	0.0000	9.529E-02	0.0001	1.187E-02	0.0000	2.650E-01	0.0003	6.321E-01	0.0007
Pu-238	6.559E-02	0.0001	1.268E-04	0.0000	0.000E+00	0.0000	3.694E-02	0.0000	9.268E-05	0.0000	5.195E-06	0.0000	1.274E-01	0.0001
Pu-239	6.243E-02	0.0001	1.207E-04	0.0000	0.000E+00	0.0000	3.516E-02	0.0000	8.842E-05	0.0000	4.938E-06	0.0000	1.212E-01	0.0001
Pu-241	7.199E-02	0.0001	1.389E-04	0.0000	0.000E+00	0.0000	4.043E-02	0.0000	8.490E-05	0.0000	7.416E-06	0.0000	1.318E-01	0.0002
Sr-90	2.205E+02	0.2537	8.532E-01	0.0010	0.000E+00	0.0000	1.324E+02	0.1523	2.526E+01	0.0291	3.513E+01	0.0404	4.672E+02	0.5375
U-234	6.240E-01	0.0007	4.021E-04	0.0000	0.000E+00	0.0000	3.516E-01	0.0004	3.005E-03	0.0000	2.961E-02	0.0000	1.091E+00	0.0013
U-235	5.437E-02	0.0001	3.504E-05	0.0000	0.000E+00	0.0000	3.063E-02	0.0000	2.789E-04	0.0000	2.566E-03	0.0000	1.217E-01	0.0001
U-238	5.871E-01	0.0007	3.783E-04	0.0000	0.000E+00	0.0000	3.308E-01	0.0004	2.827E-03	0.0000	2.786E-02	0.0000	1.083E+00	0.0012
	3.450E+02	0.3970	1.635E+01	0.0188	0.000E+00	0.0000	2.031E+02	0.2337	7.682E+01	0.0884	1.117E+02	0.1286	8.692E+02	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-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	5.032E-03	0.0000	3.713E-04	0.0000	0.000E+00	0.0000	9.801E-02	0.0001	1.392E-03	0.0000	1.264E-04	0.0000	1.483E-02	0.0000
Cm-245	2.549E-02	0.0000	2.503E-04	0.0000	0.000E+00	0.0000	6.624E-02	0.0001	3.781E-04	0.0000	6.675E-05	0.0000	1.002E-02	0.0000
Co-60	6.228E+00	0.0076	6.300E-07	0.0000	0.000E+00	0.0000	1.991E-01	0.0002	3.288E-02	0.0000	1.176E-02	0.0000	3.770E-04	0.0000
Cs-137	4.223E+01	0.0518	2.977E-06	0.0000	0.000E+00	0.0000	6.006E+00	0.0074	2.120E+00	0.0026	1.800E+00	0.0022	2.273E-02	0.0000
Fe-55	0.000E+00	0.0000	9.844E-08	0.0000	0.000E+00	0.0000	7.155E-04	0.0000	4.065E-03	0.0000	1.406E-04	0.0000	1.082E-04	0.0000
H-3	0.000E+00	0.0000	5.167E-04	0.0000	0.000E+00	0.0000	1.952E-02	0.0000	1.218E-03	0.0000	2.450E-03	0.0000	9.285E-07	0.0000
Ni-63	0.000E+00	0.0000	3.517E-07	0.0000	0.000E+00	0.0000	5.188E-02	0.0001	2.684E-03	0.0000	3.556E-02	0.0000	1.572E-04	0.0000
Pu-238	4.312E-06	0.0000	7.842E-05	0.0000	0.000E+00	0.0000	2.061E-02	0.0000	5.853E-04	0.0000	1.351E-05	0.0000	3.119E-03	0.0000
Pu-239	7.026E-06	0.0000	7.444E-05	0.0000	0.000E+00	0.0000	1.978E-02	0.0000	5.616E-04	0.0000	1.296E-05	0.0000	2.992E-03	0.0000
Pu-241	1.176E-04	0.0000	6.267E-05	0.0000	0.000E+00	0.0000	1.673E-02	0.0000	4.483E-04	0.0000	1.224E-05	0.0000	2.531E-03	0.0000
Sr-90	1.000E-01	0.0001	3.989E-05	0.0000	0.000E+00	0.0000	4.501E+01	0.0552	2.059E+00	0.0025	2.141E+00	0.0026	2.269E-02	0.0000
U-234	1.572E-04	0.0000	3.737E-04	0.0000	0.000E+00	0.0000	6.443E-02	0.0001	2.553E-03	0.0000	1.064E-02	0.0000	3.903E-03	0.0000
U-235	2.672E-02	0.0000	3.199E-05	0.0000	0.000E+00	0.0000	5.611E-03	0.0000	2.256E-04	0.0000	9.219E-04	0.0000	3.386E-04	0.0000
U-238	5.711E-02	0.0001	3.306E-04	0.0000	0.000E+00	0.0000	6.062E-02	0.0001	2.402E-03	0.0000	1.001E-02	0.0000	3.672E-03	0.0000
Total	4.867E+01	0.0597	2.134E-03	0.0000	0.000E+00	0.0000	5.164E+01	0.0633	4.229E+00	0.0052	4.013E+00	0.0049	8.748E-02	0.0001

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-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	1.129E+00	0.0014	2.182E-03	0.0000	0.000E+00	0.0000	6.358E-01	0.0008	7.994E-04	0.0000	1.786E-04	0.0000	1.888E+00	0.0023
Cm-245	2.468E-01	0.0003	4.770E-04	0.0000	0.000E+00	0.0000	1.390E-01	0.0002	7.045E-05	0.0000	3.900E-05	0.0000	4.888E-01	0.0006
Co-60	7.406E-01	0.0009	1.432E-02	0.0000	0.000E+00	0.0000	4.244E-01	0.0005	2.104E-01	0.0003	1.174E-01	0.0001	7.979E+00	0.0098
Cs-137	1.141E+02	0.1399	1.471E+01	0.0180	0.000E+00	0.0000	6.483E+01	0.0795	4.868E+01	0.0597	7.234E+01	0.0887	3.668E+02	0.4498
Fe-55	2.768E-01	0.0003	3.568E-03	0.0000	0.000E+00	0.0000	1.559E-01	0.0002	7.853E-02	0.0001	6.572E-03	0.0000	5.264E-01	0.0006
H-3	6.386E-02	0.0001	4.212E-06	0.0000	0.000E+00	0.0000	3.126E-02	0.0000	4.827E-03	0.0000	1.460E-02	0.0000	1.382E-01	0.0002
Ni-63	1.652E-01	0.0002	1.064E-03	0.0000	0.000E+00	0.0000	9.403E-02	0.0001	1.171E-02	0.0000	2.615E-01	0.0003	6.238E-01	0.0008
Pu-238	6.504E-02	0.0001	1.257E-04	0.0000	0.000E+00	0.0000	3.663E-02	0.0000	9.211E-05	0.0000	5.158E-06	0.0000	1.263E-01	0.0002
Pu-239	6.240E-02	0.0001	1.206E-04	0.0000	0.000E+00	0.0000	3.515E-02	0.0000	8.838E-05	0.0000	4.935E-06	0.0000	1.212E-01	0.0001
Pu-241	8.448E-02	0.0001	1.630E-04	0.0000	0.000E+00	0.0000	4.745E-02	0.0001	9.201E-05	0.0000	9.566E-06	0.0000	1.521E-01	0.0002
Sr-90	2.050E+02	0.2513	7.930E-01	0.0010	0.000E+00	0.0000	1.231E+02	0.1509	2.350E+01	0.0288	3.266E+01	0.0401	4.343E+02	0.5326
U-234	6.233E-01	0.0008	4.016E-04	0.0000	0.000E+00	0.0000	3.511E-01	0.0004	3.001E-03	0.0000	2.958E-02	0.0000	1.089E+00	0.0013
U-235	5.453E-02	0.0001	3.516E-05	0.0000	0.000E+00	0.0000	3.072E-02	0.0000	2.919E-04	0.0000	2.563E-03	0.0000	1.220E-01	0.0001
U-238	5.864E-01	0.0007	3.778E-04	0.0000	0.000E+00	0.0000	3.304E-01	0.0004	2.824E-03	0.0000	2.783E-02	0.0000	1.082E+00	0.0013
	3.231E+02	0.3963	1.552E+01	0.0190	0.000E+00	0.0000	1.902E+02	0.2333	7.249E+01	0.0889	1.055E+02	0.1293	8.155E+02	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-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	5.012E-03	0.0000	3.698E-04	0.0000	0.000E+00	0.0000	9.762E-02	0.0001	1.386E-03	0.0000	1.279E-04	0.0000	1.477E-02	0.0000
Cm-245	2.549E-02	0.0000	2.507E-04	0.0000	0.000E+00	0.0000	6.634E-02	0.0001	3.612E-04	0.0000	8.681E-05	0.0000	1.004E-02	0.0000
Co-60	4.686E+00	0.0065	4.741E-07	0.0000	0.000E+00	0.0000	1.498E-01	0.0002	2.474E-02	0.0000	8.846E-03	0.0000	2.837E-04	0.0000
Cs-137	3.818E+01	0.0531	2.691E-06	0.0000	0.000E+00	0.0000	5.430E+00	0.0076	1.917E+00	0.0027	1.628E+00	0.0023	2.055E-02	0.0000
Fe-55	0.000E+00	0.0000	5.729E-08	0.0000	0.000E+00	0.0000	4.164E-04	0.0000	2.366E-03	0.0000	8.162E-05	0.0000	6.298E-05	0.0000
H-3	0.000E+00	0.0000	2.769E-05	0.0000	0.000E+00	0.0000	1.046E-03	0.0000	6.530E-05	0.0000	1.313E-04	0.0000	4.975E-08	0.0000
Ni-63	0.000E+00	0.0000	3.427E-07	0.0000	0.000E+00	0.0000	5.055E-02	0.0001	2.616E-03	0.0000	3.465E-02	0.0000	1.532E-04	0.0000
Pu-238	4.244E-06	0.0000	7.717E-05	0.0000	0.000E+00	0.0000	2.028E-02	0.0000	5.760E-04	0.0000	1.330E-05	0.0000	3.069E-03	0.0000
Pu-239	7.024E-06	0.0000	7.441E-05	0.0000	0.000E+00	0.0000	1.977E-02	0.0000	5.614E-04	0.0000	1.295E-05	0.0000	2.991E-03	0.0000
Pu-241	2.386E-04	0.0000	6.664E-05	0.0000	0.000E+00	0.0000	1.776E-02	0.0000	4.435E-04	0.0000	1.448E-05	0.0000	2.687E-03	0.0000
Sr-90	6.646E-02	0.0001	3.448E-05	0.0000	0.000E+00	0.0000	3.890E+01	0.0541	1.780E+00	0.0025	1.850E+00	0.0026	1.962E-02	0.0000
U-234	1.570E-04	0.0000	3.731E-04	0.0000	0.000E+00	0.0000	6.432E-02	0.0001	2.548E-03	0.0000	1.062E-02	0.0000	3.896E-03	0.0000
U-235	2.667E-02	0.0000	3.195E-05	0.0000	0.000E+00	0.0000	5.639E-03	0.0000	2.313E-04	0.0000	9.203E-04	0.0000	3.386E-04	0.0000
U-238	5.701E-02	0.0001	3.301E-04	0.0000	0.000E+00	0.0000	6.052E-02	0.0001	2.398E-03	0.0000	9.993E-03	0.0000	3.666E-03	0.0000
Total	4.306E+01	0.0599	1.640E-03	0.0000	0.000E+00	0.0000	4.489E+01	0.0625	3.735E+00	0.0052	3.544E+00	0.0049	8.212E-02	0.0001

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-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	1.124E+00	0.0016	2.172E-03	0.0000	0.000E+00	0.0000	6.328E-01	0.0009	7.957E-04	0.0000	1.777E-04	0.0000	1.879E+00	0.0026
Cm-245	2.472E-01	0.0003	4.778E-04	0.0000	0.000E+00	0.0000	1.392E-01	0.0002	7.106E-05	0.0000	3.904E-05	0.0000	4.896E-01	0.0007
Co-60	5.569E-01	0.0008	1.077E-02	0.0000	0.000E+00	0.0000	3.192E-01	0.0004	1.582E-01	0.0002	8.825E-02	0.0001	6.003E+00	0.0084
Cs-137	1.031E+02	0.1434	1.329E+01	0.0185	0.000E+00	0.0000	5.858E+01	0.0815	4.398E+01	0.0612	6.536E+01	0.0909	3.315E+02	0.4612
Fe-55	1.610E-01	0.0002	2.075E-03	0.0000	0.000E+00	0.0000	9.069E-02	0.0001	4.568E-02	0.0001	3.623E-03	0.0000	3.062E-01	0.0004
H-3	3.418E-03	0.0000	2.255E-07	0.0000	0.000E+00	0.0000	1.673E-03	0.0000	2.584E-04	0.0000	7.814E-04	0.0000	7.401E-03	0.0000
Ni-63	1.608E-01	0.0002	1.037E-03	0.0000	0.000E+00	0.0000	9.157E-02	0.0001	1.141E-02	0.0000	2.547E-01	0.0004	6.075E-01	0.0008
Pu-238	6.396E-02	0.0001	1.236E-04	0.0000	0.000E+00	0.0000	3.602E-02	0.0001	9.059E-05	0.0000	5.085E-06	0.0000	1.242E-01	0.0002
Pu-239	6.234E-02	0.0001	1.205E-04	0.0000	0.000E+00	0.0000	3.511E-02	0.0000	8.829E-05	0.0000	4.931E-06	0.0000	1.211E-01	0.0002
Pu-241	1.076E-01	0.0001	2.077E-04	0.0000	0.000E+00	0.0000	6.049E-02	0.0001	1.054E-04	0.0000	1.358E-05	0.0000	1.896E-01	0.0003
Sr-90	1.770E+02	0.2464	6.850E-01	0.0010	0.000E+00	0.0000	1.063E+02	0.1479	2.030E+01	0.0282	2.822E+01	0.0393	3.752E+02	0.5221
U-234	6.218E-01	0.0009	4.006E-04	0.0000	0.000E+00	0.0000	3.503E-01	0.0005	2.994E-03	0.0000	2.950E-02	0.0000	1.087E+00	0.0015
U-235	5.492E-02	0.0001	3.545E-05	0.0000	0.000E+00	0.0000	3.094E-02	0.0000	3.181E-04	0.0000	2.557E-03	0.0000	1.226E-01	0.0002
U-238	5.850E-01	0.0008	3.769E-04	0.0000	0.000E+00	0.0000	3.296E-01	0.0005	2.817E-03	0.0000	2.776E-02	0.0000	1.079E+00	0.0015
	2.839E+02	0.3950	1.399E+01	0.0195	0.000E+00	0.0000	1.670E+02	0.2324	6.450E+01	0.0897	9.399E+01	0.1308	7.187E+02	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-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	4.942E-03	0.0000	3.646E-04	0.0000	0.000E+00	0.0000	9.625E-02	0.0002	1.367E-03	0.0000	1.261E-04	0.0000	1.456E-02	0.0000
Cm-245	2.546E-02	0.0001	2.522E-04	0.0000	0.000E+00	0.0000	6.674E-02	0.0001	3.918E-04	0.0000	8.714E-05	0.0000	1.010E-02	0.0000
Co-60	1.732E+00	0.0037	1.752E-07	0.0000	0.000E+00	0.0000	5.536E-02	0.0001	9.143E-03	0.0000	3.269E-03	0.0000	1.048E-04	0.0000
Cs-137	2.683E+01	0.0577	1.891E-06	0.0000	0.000E+00	0.0000	3.816E+00	0.0082	1.347E+00	0.0029	1.144E+00	0.0025	1.444E-02	0.0000
Fe-55	0.000E+00	0.0000	8.617E-09	0.0000	0.000E+00	0.0000	6.263E-05	0.0000	3.558E-04	0.0000	1.231E-05	0.0000	9.472E-06	0.0000
H-3	0.000E+00	0.0000	9.709E-10	0.0000	0.000E+00	0.0000	3.668E-08	0.0000	2.291E-09	0.0000	4.607E-09	0.0000	1.745E-12	0.0000
Ni-63	0.000E+00	0.0000	3.130E-07	0.0000	0.000E+00	0.0000	4.617E-02	0.0001	2.389E-03	0.0000	3.165E-02	0.0001	1.399E-04	0.0000
Pu-238	4.012E-06	0.0000	7.297E-05	0.0000	0.000E+00	0.0000	1.918E-02	0.0000	5.446E-04	0.0000	1.259E-05	0.0000	2.902E-03	0.0000
Pu-239	7.017E-06	0.0000	7.434E-05	0.0000	0.000E+00	0.0000	1.975E-02	0.0000	5.608E-04	0.0000	1.294E-05	0.0000	2.988E-03	0.0000
Pu-241	5.771E-04	0.0000	7.756E-05	0.0000	0.000E+00	0.0000	2.059E-02	0.0000	4.289E-04	0.0000	2.071E-05	0.0000	3.116E-03	0.0000
Sr-90	5.191E-02	0.0001	2.070E-05	0.0000	0.000E+00	0.0000	2.336E+01	0.0502	1.069E+00	0.0023	1.111E+00	0.0024	1.178E-02	0.0000
U-234	1.569E-04	0.0000	3.708E-04	0.0000	0.000E+00	0.0000	6.394E-02	0.0001	2.533E-03	0.0000	1.056E-02	0.0000	3.673E-03	0.0000
U-235	2.651E-02	0.0001	3.186E-05	0.0000	0.000E+00	0.0000	5.741E-03	0.0000	2.509E-04	0.0000	9.149E-04	0.0000	3.390E-04	0.0000
U-238	5.667E-02	0.0001	3.281E-04	0.0000	0.000E+00	0.0000	6.015E-02	0.0001	2.383E-03	0.0000	9.933E-03	0.0000	3.643E-03	0.0000
Total	2.872E+01	0.0617	1.596E-03	0.0000	0.000E+00	0.0000	2.763E+01	0.0594	2.436E+00	0.0052	2.312E+00	0.0050	6.800E-02	0.0001

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-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	1.105E+00	0.0024	2.137E-03	0.0000	0.000E+00	0.0000	6.225E-01	0.0013	7.828E-04	0.0000	1.748E-04	0.0000	1.848E+00	0.0040
Cm-245	2.497E-01	0.0005	4.827E-04	0.0000	0.000E+00	0.0000	1.406E-01	0.0003	7.385E-05	0.0000	3.936E-05	0.0000	4.940E-01	0.0011
Co-60	2.054E-01	0.0004	3.970E-03	0.0000	0.000E+00	0.0000	1.177E-01	0.0003	5.833E-02	0.0001	3.254E-02	0.0001	2.218E+00	0.0048
Cs-137	7.226E+01	0.1553	9.316E+00	0.0200	0.000E+00	0.0000	4.107E+01	0.0883	3.083E+01	0.0663	4.582E+01	0.0985	2.324E+02	0.4996
Fe-55	2.415E-02	0.0001	3.113E-04	0.0000	0.000E+00	0.0000	1.361E-02	0.0000	6.854E-03	0.0000	5.736E-04	0.0000	4.594E-02	0.0001
H-3	1.195E-07	0.0000	7.880E-12	0.0000	0.000E+00	0.0000	5.848E-08	0.0000	9.032E-09	0.0000	2.731E-08	0.0000	2.588E-07	0.0000
Ni-63	1.466E-01	0.0003	9.445E-04	0.0000	0.000E+00	0.0000	8.344E-02	0.0002	1.040E-02	0.0000	2.321E-01	0.0005	5.538E-01	0.0012
Pu-238	6.033E-02	0.0001	1.166E-04	0.0000	0.000E+00	0.0000	3.398E-02	0.0001	8.545E-05	0.0000	4.857E-06	0.0000	1.172E-01	0.0003
Pu-239	6.214E-02	0.0001	1.201E-04	0.0000	0.000E+00	0.0000	3.500E-02	0.0001	8.800E-05	0.0000	4.914E-06	0.0000	1.207E-01	0.0003
Pu-241	1.719E-01	0.0004	3.321E-04	0.0000	0.000E+00	0.0000	9.674E-02	0.0002	1.425E-04	0.0000	2.474E-05	0.0000	2.940E-01	0.0006
Sr-90	1.061E+02	0.2280	4.104E-01	0.0009	0.000E+00	0.0000	6.370E+01	0.1369	1.216E+01	0.0261	1.690E+01	0.0363	2.248E+02	0.4833
U-234	6.165E-01	0.0013	3.973E-04	0.0000	0.000E+00	0.0000	3.473E-01	0.0007	2.969E-03	0.0000	2.926E-02	0.0001	1.078E+00	0.0023
U-235	5.673E-02	0.0001	3.693E-05	0.0000	0.000E+00	0.0000	3.196E-02	0.0001	4.079E-04	0.0000	2.538E-03	0.0000	1.255E-01	0.0003
U-238	5.801E-01	0.0012	3.738E-04	0.0000	0.000E+00	0.0000	3.268E-01	0.0007	2.794E-03	0.0000	2.753E-02	0.0001	1.071E+00	0.0023
	1.816E+02	0.3903	9.736E+00	0.0209	0.000E+00	0.0000	1.066E+02	0.2292	4.307E+01	0.0926	6.305E+01	0.1355	4.652E+02	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-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	4.747E-03	0.0000	3.502E-04	0.0000	0.000E+00	0.0000	9.246E-02	0.0007	1.313E-03	0.0000	1.211E-04	0.0000	1.399E-02	0.0001
Cm-245	2.541E-02	0.0002	2.574E-04	0.0000	0.000E+00	0.0000	6.813E-02	0.0005	4.204E-04	0.0000	8.867E-05	0.0000	1.031E-02	0.0001
Co-60	1.008E-01	0.0007	1.020E-08	0.0000	0.000E+00	0.0000	3.223E-03	0.0000	5.321E-04	0.0000	1.903E-04	0.0000	6.101E-06	0.0000
Cs-137	9.790E+00	0.0689	6.901E-07	0.0000	0.000E+00	0.0000	1.392E+00	0.0098	4.915E-01	0.0035	4.174E-01	0.0029	5.269E-03	0.0000
Fe-55	0.000E+00	0.0000	3.842E-11	0.0000	0.000E+00	0.0000	2.793E-07	0.0000	1.587E-06	0.0000	5.487E-08	0.0000	4.224E-08	0.0000
H-3	0.000E+00	0.0000	1.594E-22	0.0000	0.000E+00	0.0000	6.024E-21	0.0000	3.769E-22	0.0000	7.573E-22	0.0000	2.865E-25	0.0000
Ni-63	0.000E+00	0.0000	2.416E-07	0.0000	0.000E+00	0.0000	3.564E-02	0.0003	1.844E-03	0.0000	2.443E-02	0.0002	1.080E-04	0.0000
Pu-238	3.419E-06	0.0000	6.216E-05	0.0000	0.000E+00	0.0000	1.634E-02	0.0001	4.639E-04	0.0000	1.076E-05	0.0000	2.472E-03	0.0000
Pu-239	6.998E-06	0.0000	7.413E-05	0.0000	0.000E+00	0.0000	1.969E-02	0.0001	5.592E-04	0.0000	1.290E-05	0.0000	2.980E-03	0.0000
Pu-241	1.073E-03	0.0000	9.248E-05	0.0000	0.000E+00	0.0000	2.446E-02	0.0002	3.993E-04	0.0000	2.966E-05	0.0000	3.701E-03	0.0000
Sr-90	1.209E-02	0.0001	4.821E-06	0.0000	0.000E+00	0.0000	5.440E+00	0.0383	2.489E-01	0.0018	2.587E-01	0.0018	2.743E-03	0.0000
U-234	1.608E-04	0.0000	3.646E-04	0.0000	0.000E+00	0.0000	6.285E-02	0.0004	2.490E-03	0.0000	1.037E-02	0.0001	3.807E-03	0.0000
U-235	2.607E-02	0.0002	3.174E-05	0.0000	0.000E+00	0.0000	6.042E-03	0.0000	3.032E-04	0.0000	8.995E-04	0.0000	3.417E-04	0.0000
U-238	5.569E-02	0.0004	3.224E-04	0.0000	0.000E+00	0.0000	5.912E-02	0.0004	2.342E-03	0.0000	9.762E-03	0.0001	3.581E-03	0.0000
Total	1.002E+01	0.0705	1.561E-03	0.0000	0.000E+00	0.0000	7.220E+00	0.0508	7.510E-01	0.0053	7.221E-01	0.0051	4.930E-02	0.0003

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-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	1.054E+00	0.0074	2.038E-03	0.0000	0.000E+00	0.0000	5.939E-01	0.0042	7.470E-04	0.0000	1.668E-04	0.0000	1.764E+00	0.0124
Cm-245	2.627E-01	0.0018	5.078E-04	0.0000	0.000E+00	0.0000	1.480E-01	0.0010	8.513E-05	0.0000	4.132E-05	0.0000	5.159E-01	0.0036
Co-60	1.167E-02	0.0001	2.295E-04	0.0000	0.000E+00	0.0000	6.803E-03	0.0000	3.372E-03	0.0000	1.881E-03	0.0000	1.289E-01	0.0009
Cs-137	2.619E+01	0.1843	3.377E+00	0.0238	0.000E+00	0.0000	1.489E+01	0.1047	1.118E+01	0.0786	1.661E+01	0.1169	8.434E+01	0.5934
Fe-55	1.070E-04	0.0000	1.379E-06	0.0000	0.000E+00	0.0000	6.027E-05	0.0000	3.036E-05	0.0000	2.540E-06	0.0000	2.035E-04	0.0000
H-3	1.942E-20	0.0000	1.261E-24	0.0000	0.000E+00	0.0000	9.509E-21	0.0000	1.469E-21	0.0000	4.441E-21	0.0000	4.216E-20	0.0000
Ni-63	1.124E-01	0.0008	7.242E-04	0.0000	0.000E+00	0.0000	6.398E-02	0.0005	7.971E-03	0.0001	1.780E-01	0.0013	4.250E-01	0.0030
Pu-238	5.106E-02	0.0004	9.869E-05	0.0000	0.000E+00	0.0000	2.876E-02	0.0002	7.232E-05	0.0000	4.201E-06	0.0000	9.934E-02	0.0007
Pu-239	6.155E-02	0.0004	1.190E-04	0.0000	0.000E+00	0.0000	3.466E-02	0.0002	8.716E-05	0.0000	4.867E-06	0.0000	1.197E-01	0.0008
Pu-241	2.635E-01	0.0019	5.093E-04	0.0000	0.000E+00	0.0000	1.484E-01	0.0010	1.945E-04	0.0000	4.075E-05	0.0000	4.424E-01	0.0031
Sr-90	2.453E+01	0.1726	9.492E-02	0.0007	0.000E+00	0.0000	1.473E+01	0.1037	2.812E+00	0.0198	3.910E+00	0.0275	5.204E+01	0.3662
U-234	6.018E-01	0.0042	3.882E-04	0.0000	0.000E+00	0.0000	3.391E-01	0.0024	2.899E-03	0.0000	2.856E-02	0.0002	1.053E+00	0.0074
U-235	6.441E-02	0.0005	4.365E-05	0.0000	0.000E+00	0.0000	3.629E-02	0.0003	6.471E-04	0.0000	2.487E-03	0.0000	1.376E-01	0.0010
U-238	5.663E-01	0.0040	3.649E-04	0.0000	0.000E+00	0.0000	3.190E-01	0.0022	2.727E-03	0.0000	2.667E-02	0.0002	1.046E+00	0.0074
	5.377E+01	0.3784	3.477E+00	0.0245	0.000E-00	0.0000	3.134E+01	0.2205	1.401E+01	0.0986	2.076E+01	0.1461	1.421E+02	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-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	4.124E-03	0.0005	3.041E-04	0.0000	0.000E+00	0.0000	8.032E-02	0.0103	1.141E-03	0.0001	1.052E-04	0.0000	1.214E-02	0.0016
Cm-245	2.534E-02	0.0033	2.775E-04	0.0000	0.000E+00	0.0000	7.344E-02	0.0095	5.078E-04	0.0001	9.546E-05	0.0000	1.111E-02	0.0014
Co-60	4.793E-06	0.0000	4.648E-13	0.0000	0.000E+00	0.0000	1.532E-07	0.0000	2.530E-08	0.0000	9.047E-09	0.0000	2.901E-10	0.0000
Cs-137	2.874E-01	0.0370	2.026E-08	0.0000	0.000E+00	0.0000	4.088E-02	0.0053	1.443E-02	0.0019	1.225E-02	0.0016	1.547E-04	0.0000
Fe-55	0.000E+00	0.0000	2.275E-19	0.0000	0.000E+00	0.0000	1.653E-15	0.0000	9.393E-15	0.0000	3.249E-16	0.0000	2.501E-16	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ni-63	0.000E+00	0.0000	9.766E-08	0.0000	0.000E+00	0.0000	1.441E-02	0.0019	7.454E-04	0.0001	9.873E-03	0.0013	4.364E-05	0.0000
Pu-238	1.953E-06	0.0000	3.548E-05	0.0000	0.000E+00	0.0000	9.324E-03	0.0012	2.648E-04	0.0000	6.250E-06	0.0000	1.411E-03	0.0002
Pu-239	6.930E-06	0.0000	7.339E-05	0.0000	0.000E+00	0.0000	1.950E-02	0.0025	5.537E-04	0.0001	1.278E-05	0.0000	2.950E-03	0.0004
Pu-241	1.216E-03	0.0002	9.016E-05	0.0000	0.000E+00	0.0000	2.382E-02	0.0031	3.400E-04	0.0000	3.111E-05	0.0000	3.601E-03	0.0005
Sr-90	7.365E-05	0.0000	2.937E-08	0.0000	0.000E+00	0.0000	3.314E-02	0.0043	1.517E-03	0.0002	1.576E-03	0.0002	1.671E-05	0.0000
U-234	2.181E-04	0.0000	3.436E-04	0.0000	0.000E+00	0.0000	5.929E-02	0.0076	2.345E-03	0.0003	9.764E-03	0.0013	3.588E-03	0.0005
U-235	2.460E-02	0.0032	3.173E-05	0.0000	0.000E+00	0.0000	6.952E-03	0.0009	4.503E-04	0.0001	8.483E-04	0.0001	3.527E-04	0.0000
U-238	5.240E-02	0.0067	3.035E-04	0.0000	0.000E+00	0.0000	5.564E-02	0.0072	2.204E-03	0.0003	9.187E-03	0.0012	3.370E-03	0.0004
Total	3.954E-01	0.0509	1.460E-03	0.0002	0.000E+00	0.0000	4.167E-01	0.0536	2.450E-02	0.0032	4.375E-02	0.0056	3.874E-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 = 1.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	8.939E-01	0.1151	1.728E-03	0.0002	0.000E+00	0.0000	5.035E-01	0.0648	6.339E-04	0.0001	1.414E-04	0.0000	1.498E+00	0.1928
Cm-245	3.211E-01	0.0413	6.207E-04	0.0001	0.000E+00	0.0000	1.808E-01	0.0233	1.309E-04	0.0000	5.049E-05	0.0000	6.135E-01	0.0790
Co-60	5.511E-07	0.0000	1.066E-08	0.0000	0.000E+00	0.0000	3.158E-07	0.0000	1.565E-07	0.0000	8.733E-08	0.0000	6.102E-06	0.0000
Cs-137	7.508E-01	0.0966	9.660E-02	0.0125	0.000E+00	0.0000	4.267E-01	0.0549	3.203E-01	0.0412	4.761E-01	0.0613	2.426E+00	0.3122
Fe-55	6.184E-13	0.0000	7.971E-15	0.0000	0.000E+00	0.0000	3.484E-13	0.0000	1.755E-13	0.0000	1.469E-14	0.0000	1.177E-12	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ni-63	4.435E-02	0.0057	2.858E-04	0.0000	0.000E+00	0.0000	2.525E-02	0.0032	3.145E-03	0.0004	7.022E-02	0.0090	1.683E-01	0.0217
Pu-238	2.846E-02	0.0037	5.500E-05	0.0000	0.000E+00	0.0000	1.603E-02	0.0021	4.033E-05	0.0000	2.636E-06	0.0000	5.562E-02	0.0072
Pu-239	5.950E-02	0.0077	1.150E-04	0.0000	0.000E+00	0.0000	3.351E-02	0.0043	8.426E-05	0.0000	4.706E-06	0.0000	1.163E-01	0.0150
Pu-241	2.767E-01	0.0356	5.348E-04	0.0001	0.000E+00	0.0000	1.558E-01	0.0201	1.964E-04	0.0000	4.374E-05	0.0000	4.624E-01	0.0595
Sr-90	1.459E-01	0.0188	5.647E-04	0.0001	0.000E+00	0.0000	8.765E-02	0.0113	1.673E-02	0.0022	2.326E-02	0.0030	3.105E-01	0.0400
U-234	5.533E-01	0.0712	3.629E-04	0.0000	0.000E+00	0.0000	3.117E-01	0.0401	2.668E-03	0.0003	2.625E-02	0.0034	9.698E-01	0.1248
U-235	9.492E-02	0.0122	7.146E-05	0.0000	0.000E+00	0.0000	5.348E-02	0.0069	1.303E-03	0.0002	2.330E-03	0.0003	1.853E-01	0.0239
U-238	5.204E-01	0.0670	3.353E-04	0.0000	0.000E+00	0.0000	2.932E-01	0.0377	2.506E-03	0.0003	2.469E-02	0.0032	9.642E-01	0.1241
	3.689E+00	0.4748	1.015E-01	0.0131	0.000E+00	0.0000	2.088E+00	0.2687	3.478E-01	0.0448	6.231E-01	0.0802	7.770E+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-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	2.760E-03	0.0007	2.031E-04	0.0001	0.000E+00	0.0000	5.376E-02	0.0137	7.639E-04	0.0002	7.028E-05	0.0000	8.111E-03	0.0021
Cm-245	2.500E-02	0.0064	3.193E-04	0.0001	0.000E+00	0.0000	8.448E-02	0.0215	6.873E-04	0.0002	1.099E-04	0.0000	1.278E-02	0.0032
Co-60	2.136E-18	0.0000	2.161E-25	0.0000	0.000E+00	0.0000	6.829E-20	0.0000	1.128E-20	0.0000	4.032E-21	0.0000	1.293E-22	0.0000
Cs-137	1.204E-05	0.0000	8.485E-13	0.0000	0.000E+00	0.0000	1.712E-06	0.0000	6.042E-07	0.0000	5.132E-07	0.0000	6.479E-09	0.0000
Fe-55	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ni-63	0.000E+00	0.0000	7.337E-09	0.0000	0.000E+00	0.0000	1.082E-03	0.0003	5.600E-05	0.0000	7.418E-04	0.0002	3.279E-06	0.0000
Pu-238	4.025E-07	0.0000	7.149E-06	0.0000	0.000E+00	0.0000	1.878E-03	0.0005	5.335E-05	0.0000	1.436E-06	0.0000	2.841E-04	0.0001
Pu-239	6.738E-06	0.0000	7.133E-05	0.0000	0.000E+00	0.0000	1.895E-02	0.0048	5.381E-04	0.0001	1.242E-05	0.0000	2.868E-03	0.0007
Pu-241	8.219E-04	0.0002	6.049E-05	0.0000	0.000E+00	0.0000	1.601E-02	0.0041	2.275E-04	0.0001	2.093E-05	0.0000	2.416E-03	0.0006
Sr-90	3.452E-11	0.0000	1.377E-14	0.0000	0.000E+00	0.0000	1.554E-08	0.0000	7.109E-10	0.0000	7.389E-10	0.0000	7.834E-12	0.0000
U-234	6.357E-04	0.0002	2.901E-04	0.0001	0.000E+00	0.0000	5.098E-02	0.0130	1.994E-03	0.0005	8.235E-03	0.0021	3.036E-03	0.0008
U-235	2.080E-02	0.0053	3.008E-05	0.0000	0.000E+00	0.0000	8.002E-03	0.0020	6.523E-04	0.0002	7.163E-04	0.0002	3.515E-04	0.0001
U-238	4.403E-02	0.0112	2.552E-04	0.0001	0.000E+00	0.0000	4.678E-02	0.0119	1.853E-03	0.0005	7.725E-03	0.0020	2.834E-03	0.0007
Total	9.407E-02	0.0239	1.237E-03	0.0003	0.000E+00	0.0000	2.819E-01	0.0717	6.826E-03	0.0017	1.763E-02	0.0045	3.268E-02	0.0083

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-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	5.560E-01	0.1413	1.075E-03	0.0003	0.000E+00	0.0000	3.131E-01	0.0796	3.956E-04	0.0001	8.797E-05	0.0000	9.363E-01	0.2380
Cm-245	4.324E-01	0.1099	8.358E-04	0.0002	0.000E+00	0.0000	2.435E-01	0.0619	2.204E-04	0.0001	6.813E-05	0.0000	8.004E-01	0.2034
Co-60	2.287E-19	0.0000	4.421E-21	0.0000	0.000E+00	0.0000	1.310E-19	0.0000	6.495E-20	0.0000	3.624E-20	0.0000	2.685E-18	0.0000
Cs-137	2.928E-05	0.0000	3.774E-06	0.0000	0.000E+00	0.0000	1.664E-05	0.0000	1.249E-05	0.0000	1.857E-05	0.0000	9.562E-05	0.0000
Fe-55	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ni-63	3.102E-03	0.0008	1.999E-05	0.0000	0.000E+00	0.0000	1.766E-03	0.0004	2.200E-04	0.0001	4.912E-03	0.0012	1.190E-02	0.0030
Pu-238	5.344E-03	0.0014	1.032E-05	0.0000	0.000E+00	0.0000	3.010E-03	0.0008	7.606E-06	0.0000	9.414E-07	0.0000	1.060E-02	0.0027
Pu-239	5.384E-02	0.0137	1.041E-04	0.0000	0.000E+00	0.0000	3.032E-02	0.0077	7.625E-05	0.0000	4.258E-06	0.0000	1.068E-01	0.0271
Pu-241	1.734E-01	0.0441	3.353E-04	0.0001	0.000E+00	0.0000	9.768E-02	0.0248	1.234E-04	0.0000	2.744E-05	0.0000	2.911E-01	0.0740
Sr-90	6.369E-08	0.0000	2.464E-10	0.0000	0.000E+00	0.0000	3.825E-08	0.0000	7.302E-09	0.0000	1.015E-08	0.0000	1.367E-07	0.0000
U-234	4.362E-01	0.1109	3.389E-04	0.0001	0.000E+00	0.0000	2.458E-01	0.0625	2.129E-03	0.0005	2.066E-02	0.0053	7.703E-01	0.1958
U-235	1.345E-01	0.0342	1.092E-04	0.0000	0.000E+00	0.0000	7.577E-02	0.0193	2.116E-03	0.0005	1.900E-03	0.0005	2.449E-01	0.0622
U-238	4.074E-01	0.1035	2.625E-04	0.0001	0.000E+00	0.0000	2.295E-01	0.0583	1.962E-03	0.0005	1.933E-02	0.0049	7.620E-01	0.1937
[illegible]	2.202E+00	0.5597	3.095E-03	0.0008	0.000E+00	0.0000	1.240E+00	0.3153	7.263E-03	0.0018	4.701E-02	0.0119	3.934E+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-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	6.809E-04	0.0004	4.948E-05	0.0000	0.000E+00	0.0000	1.326E-02	0.0069	1.892E-04	0.0001	1.716E-05	0.0000	1.976E-03	0.0010
Cm-245	2.254E-02	0.0117	3.506E-04	0.0002	0.000E+00	0.0000	9.284E-02	0.0481	8.784E-04	0.0005	1.208E-04	0.0001	1.402E-02	0.0073
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	5.722E-21	0.0000	4.033E-28	0.0000	0.000E+00	0.0000	8.138E-22	0.0000	2.872E-22	0.0000	2.440E-22	0.0000	3.080E-24	0.0000
Fe-55	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ni-63	0.000E+00	0.0000	8.530E-13	0.0000	0.000E+00	0.0000	1.258E-07	0.0000	6.510E-09	0.0000	8.623E-08	0.0000	3.812E-10	0.0000
Pu-238	6.165E-08	0.0000	3.072E-08	0.0000	0.000E+00	0.0000	7.796E-06	0.0000	2.286E-07	0.0000	1.352E-07	0.0000	1.089E-06	0.0000
Pu-239	6.106E-06	0.0000	6.457E-05	0.0000	0.000E+00	0.0000	1.715E-02	0.0089	4.871E-04	0.0003	1.124E-05	0.0000	2.596E-03	0.0013
Pu-241	2.027E-04	0.0001	1.474E-05	0.0000	0.000E+00	0.0000	3.947E-03	0.0020	5.632E-05	0.0000	5.109E-06	0.0000	5.885E-04	0.0003
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	2.752E-03	0.0014	1.619E-04	0.0001	0.000E+00	0.0000	3.414E-02	0.0177	1.212E-03	0.0006	4.663E-03	0.0024	1.747E-03	0.0009
U-235	1.139E-02	0.0059	1.848E-05	0.0000	0.000E+00	0.0000	5.687E-03	0.0029	5.239E-04	0.0003	3.918E-04	0.0002	2.253E-04	0.0001
U-238	2.396E-02	0.0124	1.391E-04	0.0001	0.000E+00	0.0000	2.551E-02	0.0132	1.011E-03	0.0005	4.211E-03	0.0022	1.545E-03	0.0008
Total	6.152E-02	0.0319	7.988E-04	0.0004	0.000E+00	0.0000	1.925E-01	0.0998	4.358E-03	0.0023	9.421E-03	0.0049	2.270E-02	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+03 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	1.003E-01	0.0520	1.939E-04	0.0001	0.000E+00	0.0000	5.650E-02	0.0293	7.294E-05	0.0000	1.590E-05	0.0000	1.733E-01	0.0898
Cm-245	4.291E-01	0.2223	8.294E-04	0.0004	0.000E+00	0.0000	2.417E-01	0.1252	2.505E-04	0.0001	6.773E-05	0.0000	8.026E-01	0.4159
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	1.030E-20	0.0000	1.328E-21	0.0000	0.000E+00	0.0000	5.856E-21	0.0000	4.396E-21	0.0000	6.534E-21	0.0000	3.549E-20	0.0000
Fe-55	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ni-63	2.670E-07	0.0000	1.721E-09	0.0000	0.000E+00	0.0000	1.520E-07	0.0000	1.894E-08	0.0000	4.228E-07	0.0000	1.081E-06	0.0000
Pu-238	1.979E-05	0.0000	3.693E-08	0.0000	0.000E+00	0.0000	1.115E-05	0.0000	4.876E-08	0.0000	2.497E-07	0.0000	4.061E-05	0.0000
Pu-239	3.608E-02	0.0187	6.975E-05	0.0000	0.000E+00	0.0000	2.032E-02	0.0105	5.110E-05	0.0000	2.854E-06	0.0000	7.684E-02	0.0398
Pu-241	3.129E-02	0.0162	6.049E-05	0.0000	0.000E+00	0.0000	1.763E-02	0.0091	2.273E-05	0.0000	4.961E-06	0.0000	5.382E-02	0.0279
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	1.906E-01	0.0987	3.768E-04	0.0002	0.000E+00	0.0000	1.074E-01	0.0557	1.038E-03	0.0005	8.851E-03	0.0046	3.529E-01	0.1829
U-235	8.175E-02	0.0424	6.638E-05	0.0000	0.000E+00	0.0000	4.606E-02	0.0239	1.353E-03	0.0007	8.006E-04	0.0004	1.483E-01	0.0768
U-238	1.644E-01	0.0852	1.062E-04	0.0001	0.000E+00	0.0000	9.264E-02	0.0480	7.920E-04	0.0004	7.803E-03	0.0040	3.222E-01	0.1669
*	1.034E+00	0.5355	1.705E-03	0.0009	0.000E+00	0.0000	5.822E-01	0.3017	3.561E-03	0.0019	1.755E-02	0.0091	1.930E+00	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)	Branch Fraction*	DSR(j,t) (mrem/yr)/(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
Am-241	Am-241	1.000E+00	6.524E+00	6.509E+00	6.479E+00	6.374E+00	6.083E+00	5.165E+00	3.227E+00	5.960E-01
Am-241	Np-237	1.000E+00	7.567E-06	1.465E-05	2.874E-05	7.737E-05	2.105E-04	6.140E-04	1.343E-03	1.557E-03
Am-241	U-233	1.000E+00	8.738E-12	2.106E-11	6.466E-11	4.106E-10	2.941E-09	2.579E-08	1.405E-07	3.040E-07
Am-241	Th-229	1.000E+00	2.372E-11	2.373E-11	2.376E-11	2.387E-11	2.478E-11	4.785E-11	4.566E-10	5.811E-09
Am-241	ΣDSR(j)		6.524E+00	6.509E+00	6.479E+00	6.374E+00	6.084E+00	5.166E+00	3.229E+00	5.975E-01
Cm-245	Cm-245	1.000E+00	2.568E+00	2.567E+00	2.565E+00	2.556E+00	2.532E+00	2.447E+00	2.217E+00	1.525E+00
Cm-245	Pu-241	1.000E+00	2.389E-03	4.114E-03	7.319E-03	1.635E-02	3.005E-02	3.705E-02	3.378E-02	2.310E-02
Cm-245	Am-241	1.000E+00	5.132E-04	1.421E-03	4.553E-03	2.717E-02	1.536E-01	7.443E-01	1.961E+00	2.675E+00
Cm-245	Np-237	1.000E+00	3.100E-10	9.891E-10	6.175E-09	1.086E-07	1.901E-06	3.516E-05	3.216E-04	1.783E-03
Cm-245	U-233	1.000E+00	1.115E-11	1.116E-11	1.114E-11	1.142E-11	2.553E-11	8.648E-10	2.195E-08	2.506E-07
Cm-245	Th-229	1.000E+00	1.494E-10	1.493E-10	1.491E-10	1.487E-10	1.526E-10	1.487E-10	1.924E-10	2.910E-09
Cm-245	ΣDSR(j)		2.571E+00	2.573E+00	2.577E+00	2.600E+00	2.715E+00	3.229E+00	4.213E+00	4.224E+00
Cm-245	Cm-245	2.450E-05	6.293E-05	6.290E-05	6.284E-05	6.263E-05	6.203E-05	5.996E-05	5.433E-05	3.735E-05
Cm-245	Pu-241	2.450E-05	5.854E-08	1.008E-07	1.793E-07	4.006E-07	7.362E-07	9.076E-07	8.277E-07	5.658E-07
Cm-245	Np-237	2.450E-05	5.815E-12	1.824E-11	6.543E-11	4.299E-10	2.555E-09	1.316E-08	4.018E-08	8.729E-08
Cm-245	U-233	2.450E-05	2.814E-16	2.958E-16	3.820E-16	1.903E-15	2.684E-14	4.606E-13	3.707E-12	1.428E-11
Cm-245	Th-229	2.450E-05	3.653E-15	3.651E-15	3.648E-15	3.639E-15	3.741E-15	4.032E-15	1.386E-14	2.166E-13
Cm-245	ΣDSR(j)		6.299E-05	6.300E-05	6.302E-05	6.303E-05	6.277E-05	6.088E-05	5.520E-05	3.801E-05
Co-60	Co-60	1.000E+00	7.479E+00	6.487E+00	4.881E+00	1.803E+00	1.048E-01	4.961E-06	2.183E-18	0.000E+00
Cs-137	Cs-137	1.000E+00	1.109E+01	1.054E+01	9.527E+00	6.681E+00	2.424E+00	6.973E-02	2.748E-06	1.020E-21
Fe-55	Fe-55	1.000E+00	3.646E-02	2.781E-02	1.617E-02	2.427E-03	1.075E-05	6.215E-14	1.800E-37	0.000E+00
H-3	H-3	1.000E+00	7.005E-02	1.634E-02	8.749E-04	3.060E-08	4.984E-21	0.000E+00	0.000E+00	0.000E+00
Ni-63	Ni-63	1.000E+00	3.207E-02	3.165E-02	3.082E-02	2.810E-02	2.156E-02	8.540E-03	6.040E-04	5.487E-08
Pu-238	Pu-238	1.000E+00	1.819E+00	1.804E+00	1.775E+00	1.675E+00	1.419E+00	7.944E-01	1.511E-01	4.400E-04
Pu-238	U-234	1.000E+00	4.345E-06	7.465E-06	1.363E-05	3.429E-05	8.616E-05	2.035E-04	2.746E-04	1.284E-04
Pu-238	Th-230	1.000E+00	6.055E-12	1.109E-11	2.609E-11	1.304E-10	8.354E-10	6.864E-09	3.688E-08	1.281E-07
Pu-238	Ra-226	1.000E+00	3.973E-12	4.495E-12	7.536E-12	6.557E-11	1.247E-09	5.439E-08	5.140E-07	3.788E-06
Pu-238	Pb-210	1.000E+00	2.067E-11	2.184E-11	2.396E-11	4.397E-11	7.198E-10	4.226E-08	9.724E-07	7.859E-06
Pu-238	ΣDSR(j)		1.819E+00	1.804E+00	1.775E+00	1.675E+00	1.419E+00	7.946E-01	1.514E-01	5.802E-04
Pu-239	Pu-239	1.000E+00	2.021E+00	2.020E+00	2.018E+00	2.012E+00	1.996E+00	1.938E+00	1.780E+00	1.281E+00
Pu-239	U-235	1.000E+00	1.568E-09	2.890E-09	5.533E-09	1.472E-08	4.044E-08	1.245E-07	3.191E-07	6.216E-07
Pu-239	Pa-231	1.000E+00	9.303E-12	1.618E-11	4.086E-11	2.393E-10	1.715E-09	1.568E-08	9.689E-08	3.404E-07
Pu-239	Ac-227	1.000E+00	7.561E-12	8.241E-12	1.253E-11	8.788E-11	1.354E-09	2.457E-08	2.046E-07	7.842E-07
Pu-239	ΣDSR(j)		2.021E+00	2.020E+00	2.018E+00	2.012E+00	1.996E+00	1.938E+00	1.780E+00	1.281E+00

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

Parent (i)	Product (j)	Branch Fraction*	DSR(j,t) (mrem/yr)/(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
Pu-241	Pu-241	1.000E+00	3.618E-02	3.637E-02	3.301E-02	2.350E-02	8.906E-03	2.982E-04	1.816E-08	3.101E-23
Pu-241	Am-241	1.000E+00	1.477E-02	2.471E-02	4.315E-02	9.455E-02	1.688E-01	1.854E-01	1.169E-01	2.156E-02
Pu-241	Np-237	1.000E+00	8.501E-09	2.615E-08	9.254E-08	6.002E-07	3.507E-06	1.707E-05	4.380E-05	5.319E-05
Pu-241	U-233	1.000E+00	3.088E-14	5.312E-14	1.798E-13	2.346E-12	3.736E-11	6.219E-10	4.422E-09	1.052E-08
Pu-241	Th-229	1.000E+00	2.665E-13	2.927E-13	3.416E-13	4.805E-13	7.020E-13	1.308E-12	1.299E-11	1.867E-10
Pu-241	∑DSR(j)		5.295E-02	6.108E-02	7.616E-02	1.181E-01	1.777E-01	1.857E-01	1.169E-01	2.162E-02
Pu-241	Pu-241	2.450E-05	9.354E-07	8.911E-07	8.087E-07	5.758E-07	2.182E-07	7.307E-09	4.448E-13	7.597E-28
Pu-241	Np-237	2.450E-05	1.846E-10	3.501E-10	6.583E-10	1.525E-09	2.826E-09	3.407E-09	2.854E-09	1.468E-09
Pu-241	U-233	2.450E-05	1.734E-16	4.754E-16	1.506E-15	8.854E-15	4.901E-14	2.218E-13	4.789E-13	3.628E-13
Pu-241	Th-229	2.450E-05	7.513E-18	8.821E-18	1.131E-17	1.916E-17	4.356E-17	2.767E-16	2.072E-15	1.075E-14
Pu-241	∑DSR(j)		9.356E-07	8.914E-07	8.093E-07	5.773E-07	2.210E-07	1.071E-08	2.855E-09	1.468E-09
Sr-90	Sr-90	1.000E+00	3.980E+01	3.700E+01	3.196E+01	1.915E+01	4.433E+00	2.645E-02	1.164E-08	6.343E-31
U-234	U-234	1.000E+00	1.113E+00	1.112E+00	1.109E+00	1.100E+00	1.074E+00	9.685E-01	7.774E-01	3.216E-01
U-234	Th-230	1.000E+00	1.427E-06	2.074E-06	3.305E-06	7.593E-06	1.969E-05	6.025E-05	1.622E-04	3.963E-04
U-234	Ra-226	1.000E+00	1.430E-07	2.925E-07	8.765E-07	5.866E-06	4.428E-05	4.213E-04	2.799E-03	1.236E-02
U-234	Pb-210	1.000E+00	4.006E-07	4.148E-07	5.033E-07	2.113E-06	3.040E-05	5.991E-04	5.587E-03	2.578E-02
U-234	∑DSR(j)		1.113E+00	1.112E+00	1.109E+00	1.100E+00	1.074E+00	9.896E-01	7.860E-01	3.601E-01
U-235	U-235	1.000E+00	1.347E+00	1.346E+00	1.343E+00	1.332E+00	1.303E+00	1.205E+00	9.629E-01	4.287E-01
U-235	Pa-231	1.000E+00	5.166E-03	8.863E-03	1.621E-02	4.135E-02	1.082E-01	2.924E-01	5.292E-01	3.589E-01
U-235	Ac-227	1.000E+00	4.020E-04	1.095E-03	3.460E-03	2.053E-02	1.173E-01	5.616E-01	1.229E+00	8.598E-01
U-235	∑DSR(j)		1.353E+00	1.355E+00	1.362E+00	1.394E+00	1.528E+00	2.059E+00	2.721E+00	1.647E+00
U-238	U-238	1.000E+00	1.117E+00	1.115E+00	1.113E+00	1.104E+00	1.078E+00	9.937E-01	7.849E-01	3.312E-01
U-238	U-234	1.000E+00	4.490E-06	7.640E-06	1.391E-05	3.562E-05	9.569E-05	2.643E-04	6.646E-04	9.142E-04
U-238	Th-230	1.000E+00	2.229E-08	2.227E-08	2.223E-08	2.215E-08	2.240E-08	2.836E-08	8.195E-08	4.895E-07
U-238	Ra-226	1.000E+00	5.871E-08	5.855E-08	5.849E-08	5.804E-08	5.794E-08	9.245E-08	8.583E-07	1.218E-05
U-238	Pb-210	1.000E+00	3.090E-07	3.086E-07	3.079E-07	3.054E-07	2.987E-07	3.214E-07	1.709E-06	2.474E-05
U-238	∑DSR(j)		1.117E+00	1.115E+00	1.113E+00	1.104E+00	1.078E+00	9.940E-01	7.855E-01	3.321E-01

*Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
The DSR includes contributions from associated (half-life ≤ 0.5 yr) 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
Am-241	3.832E+00	3.841E+00	3.859E+00	3.922E+00	4.109E+00	4.840E+00	7.743E+00	4.184E+01
Cm-245	9.722E+00	9.717E+00	9.702E+00	9.616E+00	9.207E+00	7.743E+00	5.935E+00	5.918E+00
Co-60	3.343E+00	3.854E+00	5.122E+00	1.386E+01	2.385E+02	5.039E+06	*1.131E+15	*1.131E+15
Cs-137	2.254E+00	2.371E+00	2.624E+00	3.742E+00	1.031E+01	3.585E+02	9.096E+06	*8.701E+13
Fe-55	6.857E+02	8.990E+02	1.546E+03	1.030E+04	2.326E+06	4.022E+14	*2.409E+15	*2.409E+15
H-3	3.569E+02	1.530E+03	2.858E+04	8.171E+08	*9.594E+15	*9.594E+15	*9.594E+15	*9.594E+15
Ni-63	7.796E+02	7.899E+02	8.111E+02	8.698E+02	1.159E+03	2.928E+03	4.139E+04	4.556E+08
Pu-238	1.374E+01	1.386E+01	1.409E+01	1.493E+01	1.762E+01	3.146E+01	1.651E+02	4.309E+04
Pu-239	1.237E+01	1.238E+01	1.239E+01	1.242E+01	1.253E+01	1.290E+01	1.405E+01	1.952E+01
Pu-241	4.722E+02	4.093E+02	3.263E+02	2.118E+02	1.407E+02	1.346E+02	2.138E+02	1.157E+03
Sr-90	6.262E-01	6.757E-01	7.822E-01	1.305E+00	5.639E+00	9.453E+02	2.147E+09	*1.365E+14
U-234	2.246E+01	2.249E+01	2.254E+01	2.273E+01	2.327E+01	2.526E+01	3.181E+01	6.942E+01
U-235	1.848E+01	1.844E+01	1.835E+01	1.793E+01	1.636E+01	1.214E+01	9.187E+00	1.517E+01
U-238	2.239E+01	2.241E+01	2.247E+01	2.265E+01	2.318E+01	2.515E+01	3.183E+01	7.527E+01

*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)
Am-241	2.900E-01	0.000E+00	6.524E+00	3.832E+00	6.524E+00	3.832E+00
Cm-245	1.900E-01	600 ± 1	4.625E+00	5.406E+00	2.571E+00	9.722E+00
Co-60	1.230E+00	0.000E+00	7.479E+00	3.343E+00	7.479E+00	3.343E+00
Cs-137	3.479E+01	0.000E+00	1.109E+01	2.254E+00	1.109E+01	2.254E+00
Fe-55	1.893E+01	0.000E+00	3.646E-02	6.857E+02	3.646E-02	6.857E+02
H-3	8.460E+00	0.000E+00	7.005E-02	3.569E+02	7.005E-02	3.569E+02
Ni-63	1.971E+01	0.000E+00	3.207E-02	7.796E+02	3.207E-02	7.796E+02
Pu-238	7.000E-02	0.000E+00	1.819E+00	1.374E+01	1.819E+00	1.374E+01
Pu-239	6.000E-02	0.000E+00	2.021E+00	1.237E+01	2.021E+00	1.237E+01
Pu-241	2.490E+00	60.1 ± 0.1	1.955E-01	1.279E+02	5.295E-02	4.722E+02
Sr-90	1.174E+01	0.000E+00	3.980E+01	6.282E-01	3.980E+01	6.282E-01
U-234	9.800E-01	0.000E+00	1.113E+00	2.246E+01	1.113E+00	2.246E+01
U-235	9.000E-02	351.4 ± 0.7	3.741E+00	9.120E+00	1.353E+00	1.848E+01
U-238	9.700E-01	0.000E+00	1.117E+00	2.239E+01	1.117E+00	2.239E+01

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

Nuclide (j)	Parent (i)	BRF(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
Am-241	Am-241	1.000E+00	1.892E+00	1.888E+00	1.879E+00	1.848E+00	1.764E+00	1.498E+00	9.359E-01	1.728E-01
Am-241	Cm-245	1.000E+00	9.751E-05	2.700E-04	8.650E-04	5.163E-03	2.918E-02	1.414E-01	3.726E-01	5.082E-01
Am-241	Pu-241	1.000E+00	3.678E-02	6.153E-02	1.074E-01	2.354E-01	4.202E-01	4.616E-01	2.910E-01	5.369E-02
Am-241	ΣDOSE(j)		1.929E+00	1.949E+00	1.987E+00	2.089E+00	2.214E+00	2.101E+00	1.600E+00	7.347E-01
Np-237	Am-241	1.000E+00	2.200E-06	4.248E-06	8.335E-06	2.244E-05	6.105E-05	1.781E-04	3.894E-04	4.515E-04
Np-237	Cm-245	1.000E+00	5.890E-11	1.879E-10	1.173E-09	2.063E-08	3.612E-07	6.680E-06	6.110E-05	3.388E-04
Np-237	Cm-245	2.450E-05	1.105E-12	3.465E-12	1.243E-11	8.169E-11	4.854E-10	2.501E-09	7.635E-09	1.659E-08
Np-237	Pu-241	1.000E+00	2.117E-08	6.511E-08	2.304E-07	1.495E-06	8.732E-06	4.250E-05	1.091E-04	1.324E-04
Np-237	Pu-241	2.450E-05	4.596E-10	8.716E-10	1.639E-09	3.798E-09	7.038E-09	8.483E-09	7.106E-09	3.655E-09
Np-237	ΣDOSE(j)		2.222E-06	4.315E-06	8.566E-06	2.396E-05	7.015E-05	2.273E-04	5.596E-04	9.227E-04
U-233	Am-241	1.000E+00	2.534E-12	6.109E-12	1.875E-11	1.191E-10	8.530E-10	7.478E-09	4.075E-08	8.817E-08
U-233	Cm-245	1.000E+00	2.118E-12	2.120E-12	2.116E-12	2.170E-12	4.851E-12	1.681E-10	4.170E-09	4.762E-08
U-233	Cm-245	2.450E-05	5.346E-17	5.620E-17	7.258E-17	3.615E-16	5.100E-15	8.751E-14	7.042E-13	2.714E-12
U-233	Pu-241	1.000E+00	7.689E-14	1.323E-13	4.477E-13	5.842E-12	9.303E-11	1.549E-09	1.101E-08	2.619E-08
U-233	Pu-241	2.450E-05	4.317E-16	1.184E-15	3.750E-15	2.205E-14	1.220E-13	5.524E-13	1.192E-12	9.033E-13
U-233	ΣDOSE(j)		4.729E-12	8.362E-12	2.132E-11	1.271E-10	9.510E-10	9.195E-09	5.593E-08	1.620E-07
Th-229	Am-241	1.000E+00	6.879E-12	6.882E-12	6.889E-12	6.923E-12	7.186E-12	1.388E-11	1.324E-10	1.685E-09
Th-229	Cm-245	1.000E+00	2.838E-11	2.836E-11	2.834E-11	2.825E-11	2.900E-11	2.826E-11	3.656E-11	5.529E-10
Th-229	Cm-245	2.450E-05	6.940E-16	6.937E-16	6.931E-16	6.914E-16	7.107E-16	7.661E-16	2.634E-15	4.116E-14
Th-229	Pu-241	1.000E+00	6.636E-13	7.289E-13	8.507E-13	1.196E-12	1.748E-12	3.258E-12	3.235E-11	4.650E-10
Th-229	Pu-241	2.450E-05	1.871E-17	2.196E-17	2.816E-17	4.771E-17	1.085E-16	6.889E-16	5.160E-15	2.676E-14
Th-229	ΣDOSE(j)		3.592E-11	3.598E-11	3.608E-11	3.638E-11	3.794E-11	4.540E-11	2.013E-10	2.703E-09
Cm-245	Cm-245	1.000E+00	4.880E-01	4.878E-01	4.873E-01	4.857E-01	4.810E-01	4.650E-01	4.213E-01	2.897E-01
Cm-245	Cm-245	2.450E-05	1.196E-05	1.195E-05	1.194E-05	1.190E-05	1.179E-05	1.139E-05	1.032E-05	7.097E-06
Cm-245	ΣDOSE(j)		4.880E-01	4.878E-01	4.873E-01	4.857E-01	4.810E-01	4.650E-01	4.213E-01	2.897E-01
Pu-241	Cm-245	1.000E+00	4.539E-04	7.816E-04	1.391E-03	3.107E-03	5.709E-03	7.039E-03	6.419E-03	4.386E-03
Pu-241	Pu-241	1.000E+00	9.506E-02	9.056E-02	8.219E-02	5.852E-02	2.218E-02	7.426E-04	4.521E-08	7.721E-23
Pu-241	ΣDOSE(j)		9.552E-02	9.134E-02	8.358E-02	6.163E-02	2.788E-02	7.781E-03	6.419E-03	4.388E-03
Pu-241	Cm-245	2.450E-05	1.112E-08	1.915E-06	3.407E-08	7.611E-08	1.399E-07	1.725E-07	1.573E-07	1.075E-07
Pu-241	Pu-241	2.450E-05	2.329E-06	2.219E-06	2.014E-06	1.434E-06	5.433E-07	1.819E-08	1.108E-12	1.886E-27
Pu-241	ΣDOSE(j)		2.340E-06	2.238E-06	2.046E-06	1.510E-06	6.832E-07	1.906E-07	1.573E-07	1.075E-07
Co-60	Co-60	1.000E+00	9.199E+00	7.979E+00	6.003E+00	2.218E+00	1.289E-01	6.102E-06	2.685E-18	0.000E+00
Cs-137	Cs-137	1.000E+00	3.858E+02	3.668E+02	3.315E+02	2.324E+02	8.434E+01	2.426E+00	9.562E-05	3.549E-20
Fe-55	Fe-55	1.000E+00	6.902E-01	5.264E-01	3.062E-01	4.594E-02	2.035E-04	1.177E-12	0.000E+00	0.000E+00
H-3	H-3	1.000E+00	5.926E-01	1.382E-01	7.401E-03	2.588E-07	4.216E-20	0.000E+00	0.000E+00	0.000E+00
Ni-63	Ni-63	1.000E+00	6.321E-01	6.238E-01	6.075E-01	5.538E-01	4.250E-01	1.683E-01	1.190E-02	1.081E-06
Pu-238	Pu-238	1.000E+00	1.274E-01	1.263E-01	1.242E-01	1.172E-01	9.933E-02	5.561E-02	1.058E-02	3.080E-05

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

Nuclide (j)	Parent (i)	BRF(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
U-234	Pu-238	1.000E+00	3.041E-07	5.225E-07	9.538E-07	2.400E-06	6.031E-06	1.424E-05	1.922E-05	8.987E-06
U-234	U-234	1.000E+00	1.091E+00	1.089E+00	1.087E+00	1.078E+00	1.053E+00	9.687E-01	7.619E-01	3.152E-01
U-234	U-238	1.000E+00	4.355E-06	7.411E-06	1.349E-05	3.455E-05	9.282E-05	2.757E-04	6.447E-04	8.868E-04
U-234	ΣDOSE(j)		1.091E+00	1.089E+00	1.087E+00	1.078E+00	1.053E+00	9.690E-01	7.625E-01	3.161E-01
Th-230	Pu-238	1.000E+00	4.238E-13	7.762E-13	1.827E-12	9.128E-12	5.848E-11	4.805E-10	2.581E-09	8.967E-09
Th-230	U-234	1.000E+00	1.399E-06	2.033E-06	3.238E-06	7.441E-06	1.929E-05	5.905E-05	1.590E-04	3.883E-04
Th-230	U-238	1.000E+00	2.162E-08	2.160E-08	2.157E-08	2.149E-08	2.172E-08	2.751E-08	7.949E-08	4.748E-07
Th-230	ΣDOSE(j)		1.420E-06	2.054E-06	3.260E-06	7.462E-06	1.932E-05	5.907E-05	1.591E-04	3.888E-04
Ra-226	Pu-238	1.000E+00	2.781E-13	3.147E-13	5.275E-13	4.590E-12	8.732E-11	2.407E-09	3.598E-08	2.651E-07
Ra-226	U-234	1.000E+00	1.402E-07	2.867E-07	8.590E-07	5.749E-06	4.339E-05	4.129E-04	2.743E-03	1.212E-02
Ra-226	U-238	1.000E+00	5.695E-08	5.680E-08	5.674E-08	5.630E-08	5.620E-08	8.968E-08	8.325E-07	1.182E-05
Ra-226	ΣDOSE(j)		1.971E-07	3.435E-07	9.157E-07	5.805E-06	4.345E-05	4.130E-04	2.744E-03	1.213E-02
Pb-210	Pu-238	1.000E+00	1.461E-12	1.529E-12	1.678E-12	3.078E-12	5.039E-11	2.958E-09	6.807E-08	5.501E-07
Pb-210	U-234	1.000E+00	3.925E-07	4.065E-07	4.932E-07	2.071E-06	2.979E-05	5.872E-04	5.475E-03	2.527E-02
Pb-210	U-238	1.000E+00	2.998E-07	2.994E-07	2.987E-07	2.962E-07	2.898E-07	3.117E-07	1.658E-06	2.400E-05
Pb-210	ΣDOSE(j)		6.923E-07	7.059E-07	7.919E-07	2.367E-06	3.008E-05	5.875E-04	5.477E-03	2.529E-02
	Pu-239	1.000E+00	1.212E-01	1.212E-01	1.211E-01	1.207E-01	1.197E-01	1.163E-01	1.068E-01	7.684E-02
U-235	Pu-239	1.000E+00	9.406E-11	1.734E-10	3.320E-10	8.832E-10	2.427E-09	7.473E-09	1.915E-08	3.729E-08
U-235	U-235	1.000E+00	1.212E-01	1.211E-01	1.208E-01	1.199E-01	1.173E-01	1.085E-01	8.666E-02	3.858E-02
U-235	ΣDOSE(j)		1.212E-01	1.211E-01	1.208E-01	1.199E-01	1.173E-01	1.085E-01	8.666E-02	3.858E-02
Pa-231	Pu-239	1.000E+00	5.582E-13	9.711E-13	2.452E-12	1.436E-11	1.029E-10	9.408E-10	5.813E-09	2.043E-08
Pa-231	U-235	1.000E+00	4.650E-04	7.977E-04	1.459E-03	3.721E-03	9.742E-03	2.632E-02	4.763E-02	3.230E-02
Pa-231	ΣDOSE(j)		4.650E-04	7.977E-04	1.459E-03	3.721E-03	9.742E-03	2.632E-02	4.763E-02	3.230E-02
Ac-227	Pu-239	1.000E+00	4.537E-13	4.944E-13	7.517E-13	5.273E-12	8.123E-11	1.474E-09	1.228E-08	4.705E-08
Ac-227	U-235	1.000E+00	3.618E-05	9.857E-05	3.114E-04	1.848E-03	1.056E-02	5.056E-02	1.106E-01	7.739E-02
Ac-227	ΣDOSE(j)		3.618E-05	9.857E-05	3.114E-04	1.848E-03	1.056E-02	5.056E-02	1.106E-01	7.739E-02
Sr-90	Sr-90	1.000E+00	4.672E+02	4.343E+02	3.752E+02	2.248E+02	5.204E+01	3.105E-01	1.367E-07	0.000E+00
U-238	U-238	1.000E+00	1.083E+00	1.082E+00	1.079E+00	1.071E+00	1.046E+00	9.639E-01	7.613E-01	3.212E-01

BRF(i) is the branch fraction of the parent nuclide.

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	BRF(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
Am-241	Am-241	1.000E+00	2.900E-01	2.894E-01	2.882E-01	2.842E-01	2.730E-01	2.370E-01	1.583E-01	3.853E-02
Am-241	Cm-245	1.000E+00	0.000E+00	7.212E-06	6.279E-05	6.235E-04	4.196E-03	2.200E-02	6.272E-02	1.132E-01
Am-241	Pu-241	1.000E+00	0.000E+00	3.895E-03	1.112E-02	3.134E-02	6.099E-02	6.990E-02	4.714E-02	1.148E-02
Am-241	∑S(j):		2.900E-01	2.933E-01	2.994E-01	3.162E-01	3.381E-01	3.289E-01	2.681E-01	1.632E-01
Np-237	Am-241	1.000E+00	0.000E+00	9.380E-08	2.806E-07	9.266E-07	2.705E-06	8.198E-06	1.882E-05	2.565E-05
Np-237	Cm-245	1.000E+00	0.000E+00	7.817E-13	2.058E-11	6.995E-10	1.508E-08	3.033E-07	2.942E-06	1.924E-05
Np-237	Cm-245	2.450E-05	0.000E+00	3.570E-14	3.111E-13	3.099E-12	2.106E-11	1.149E-10	3.689E-10	9.424E-10
Np-237	Pu-241	1.000E+00	0.000E+00	6.359E-10	5.534E-09	5.489E-08	3.680E-07	1.899E-06	5.129E-06	7.353E-06
Np-237	Pu-241	2.450E-05	0.000E+00	1.928E-11	5.513E-11	1.561E-10	3.091E-10	3.836E-10	3.353E-10	2.030E-10
Np-237	∑S(j):		0.000E+00	9.446E-08	2.863E-07	9.823E-07	3.088E-06	1.040E-05	2.689E-05	5.224E-05
U-233	Am-241	1.000E+00	0.000E+00	2.049E-13	1.837E-12	2.010E-11	1.734E-10	1.662E-09	9.895E-09	2.889E-08
U-233	Cm-245	1.000E+00	0.000E+00	8.562E-19	6.786E-17	7.779E-15	5.168E-13	3.618E-11	1.008E-09	1.560E-08
U-233	Cm-245	2.450E-05	0.000E+00	5.221E-20	1.373E-18	4.654E-17	9.942E-16	1.935E-14	1.710E-13	8.900E-13
U-233	Pu-241	1.000E+00	0.000E+00	9.300E-16	2.444E-14	8.255E-13	1.746E-11	3.271E-10	2.554E-09	8.205E-09
U-233	Pu-241	2.450E-05	0.000E+00	4.246E-17	3.691E-16	3.646E-15	2.414E-14	1.186E-13	2.780E-13	2.833E-13
U-233	∑S(j):		0.000E+00	2.059E-13	1.862E-12	2.094E-11	1.914E-10	2.025E-09	1.346E-08	5.270E-08
[illegible]	Am-241	1.000E+00	0.000E+00	6.455E-18	1.737E-16	6.361E-15	1.663E-13	5.504E-12	1.089E-10	1.512E-09
[illegible]	Cm-245	1.000E+00	0.000E+00	1.620E-23	3.866E-21	1.495E-18	3.074E-16	7.767E-14	7.332E-12	4.767E-10
Th-229	Cm-245	2.450E-05	0.000E+00	1.236E-24	9.802E-23	1.127E-20	7.546E-19	5.447E-17	1.669E-15	3.649E-14
Th-229	Pu-241	1.000E+00	0.000E+00	2.201E-20	1.745E-18	2.000E-16	1.330E-14	9.327E-13	2.614E-11	4.163E-10
Th-229	Pu-241	2.450E-05	0.000E+00	1.342E-21	3.531E-20	1.197E-18	2.559E-17	4.992E-16	4.451E-15	2.405E-14
Th-229	∑S(j):		0.000E+00	6.478E-18	1.755E-16	6.564E-15	1.799E-13	6.515E-12	1.424E-10	2.405E-09
Cm-245	Cm-245	1.000E+00	1.900E-01	1.900E-01	1.899E-01	1.896E-01	1.888E-01	1.859E-01	1.781E-01	1.532E-01
Cm-245	Cm-245	2.450E-05	4.655E-06	4.654E-06	4.652E-06	4.645E-06	4.625E-06	4.556E-06	4.364E-06	3.753E-06
Cm-245	∑S(j):		1.900E-01	1.900E-01	1.899E-01	1.896E-01	1.888E-01	1.859E-01	1.781E-01	1.532E-01
Pu-241	Cm-245	1.000E+00	0.000E+00	8.927E-03	2.553E-02	7.247E-02	1.444E-01	1.848E-01	1.785E-01	1.535E-01
Pu-241	Pu-241	1.000E+00	2.490E+00	2.373E+00	2.154E+00	1.537E+00	5.855E-01	1.999E-02	1.288E-06	2.767E-21
Pu-241	∑S(j):		2.490E+00	2.382E+00	2.160E+00	1.609E+00	7.299E-01	2.048E-01	1.785E-01	1.535E-01
U-241	Cm-245	2.450E-05	0.000E+00	2.187E-07	6.256E-07	1.775E-06	3.538E-06	4.528E-06	4.373E-06	3.761E-06
U-241	Pu-241	2.450E-05	6.100E-05	5.813E-05	5.278E-05	3.766E-05	1.435E-05	4.897E-07	3.156E-11	6.779E-26
U-241	∑S(j):		6.100E-05	5.835E-05	5.341E-05	3.943E-05	1.788E-05	5.018E-06	4.373E-06	3.761E-06
Co-60	Co-60	1.000E+00	1.230E+00	1.067E+00	8.029E-01	2.967E-01	1.727E-02	8.211E-07	3.659E-19	0.000E+00
Cs-137	Cs-137	1.000E+00	3.479E+01	3.308E+01	2.991E+01	2.102E+01	7.669E+00	2.251E-01	9.429E-06	4.482E-21
Fe-55	Fe-55	1.000E+00	1.893E+01	1.444E+01	8.405E+00	1.264E+00	5.637E-03	3.337E-11	1.037E-34	0.000E+00
[illegible]	H-3	1.000E+00	8.460E+00	1.960E+00	1.050E-01	3.688E-06	6.079E-19	0.000E+00	0.000E+00	0.000E+00
Ni-63	Ni-63	1.000E+00	1.971E+01	1.946E+01	1.896E+01	1.732E+01	1.337E+01	5.403E+00	4.059E-01	4.719E-05
Pu-238	Pu-238	1.000E+00	7.000E-02	6.944E-02	6.834E-02	6.461E-02	5.504E-02	3.141E-02	6.324E-03	2.317E-05

Summary : RESRAD Default Parameters
File : Plumbrook Subsurface Modified BOP CORE MIX.RAD

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	BRF(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
U-234	Pu-238	1.000E+00	0.000E+00	1.976E-07	5.875E-07	1.899E-06	5.220E-06	1.300E-05	1.888E-05	1.160E-05
U-234	U-234	1.000E+00	9.800E-01	9.791E-01	9.774E-01	9.715E-01	9.547E-01	8.981E-01	7.543E-01	4.095E-01
U-234	U-238	1.000E+00	0.000E+00	2.748E-06	8.228E-06	2.726E-05	8.037E-05	2.520E-04	6.352E-04	1.151E-03
U-234	ΣS(j):		9.800E-01	9.791E-01	9.774E-01	9.715E-01	9.548E-01	8.984E-01	7.549E-01	4.107E-01
Th-230	Pu-238	1.000E+00	0.000E+00	8.906E-13	7.968E-12	8.672E-11	7.365E-10	6.743E-09	3.758E-08	1.349E-07
Th-230	U-234	1.000E+00	0.000E+00	8.818E-06	2.643E-05	8.783E-05	2.612E-04	8.443E-04	2.324E-03	5.845E-03
Th-230	U-238	1.000E+00	0.000E+00	1.237E-11	1.112E-10	1.231E-09	1.095E-08	1.168E-07	9.364E-07	7.045E-06
Th-230	ΣS(j):		0.000E+00	8.818E-06	2.643E-05	8.783E-05	2.612E-04	8.444E-04	2.325E-03	5.852E-03
Ra-226	Pu-238	1.000E+00	0.000E+00	1.286E-16	3.451E-15	1.252E-13	3.187E-12	9.655E-11	1.538E-09	1.347E-08
Ra-226	U-234	1.000E+00	0.000E+00	1.908E-09	1.713E-08	1.886E-07	1.654E-06	1.679E-05	1.180E-04	6.180E-04
Ra-226	U-238	1.000E+00	0.000E+00	1.785E-15	4.808E-14	1.766E-12	4.655E-11	1.587E-09	3.401E-08	6.015E-07
Ra-226	ΣS(j):		0.000E+00	1.908E-09	1.713E-08	1.886E-07	1.654E-06	1.679E-05	1.181E-04	6.186E-04
Pb-210	Pu-238	1.000E+00	0.000E+00	9.933E-19	7.904E-17	9.174E-15	6.269E-13	4.551E-11	1.156E-09	1.222E-08
Pb-210	U-234	1.000E+00	0.000E+00	1.962E-11	5.201E-10	1.809E-08	4.120E-07	9.223E-06	9.390E-05	5.647E-04
Pb-210	U-238	1.000E+00	0.000E+00	1.378E-17	1.100E-15	1.290E-13	9.074E-12	7.312E-10	2.475E-08	5.338E-07
Pb-210	ΣS(j):		0.000E+00	1.962E-11	5.201E-10	1.809E-08	4.120E-07	9.223E-06	9.393E-05	5.653E-04
	Pu-239	1.000E+00	6.000E-02	5.999E-02	5.997E-02	5.991E-02	5.974E-02	5.915E-02	5.749E-02	5.204E-02
J-235	Pu-239	1.000E+00	0.000E+00	5.906E-11	1.770E-10	5.879E-10	1.746E-09	5.619E-09	1.526E-08	3.641E-08
J-235	U-235	1.000E+00	9.000E-02	8.992E-02	8.977E-02	8.922E-02	8.768E-02	8.250E-02	6.933E-02	3.772E-02
J-235	ΣS(j):		9.000E-02	8.992E-02	8.977E-02	8.922E-02	8.768E-02	8.250E-02	6.933E-02	3.772E-02
a-231	Pu-239	1.000E+00	0.000E+00	6.242E-16	5.600E-15	6.154E-14	5.369E-13	5.359E-12	3.605E-11	1.678E-10
a-231	U-235	1.000E+00	0.000E+00	1.900E-06	5.674E-06	1.861E-05	5.336E-05	1.521E-04	2.968E-04	2.658E-04
a-231	ΣS(j):		0.000E+00	1.900E-06	5.674E-06	1.861E-05	5.336E-05	1.521E-04	2.968E-04	2.658E-04
c-227	Pu-239	1.000E+00	0.000E+00	6.559E-18	1.731E-16	5.935E-15	1.304E-13	2.678E-12	2.455E-11	1.275E-10
c-227	U-235	1.000E+00	0.000E+00	2.986E-08	2.608E-07	2.615E-06	1.793E-05	9.342E-05	2.224E-04	2.101E-04
c-227	ΣS(j):		0.000E+00	2.986E-08	2.608E-07	2.615E-06	1.793E-05	9.342E-05	2.224E-04	2.101E-04
r-90	Sr-90	1.000E+00	1.174E+01	1.091E+01	9.435E+00	5.665E+00	1.319E+00	8.038E-03	3.768E-09	2.656E-31
-238	U-238	1.000E+00	9.700E-01	9.692E-01	9.675E-01	9.616E-01	9.450E-01	8.892E-01	7.472E-01	4.065E-01

RF(i) is the branch fraction of the parent nuclide.

ESCALC.EXE execution time = 33.58 seconds

Title : Plumbrook Duplicate
Input File : 'C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th HL CORE MIX.bld

RESRAD-BUILD Table of Contents

Title : Flumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th HL CORE MIX.bld

RESRAD-BUILD Input Parameters

Number of Sources : 6
Number of Receptors: 1
Total Time : 3.652500E+02 days
Fraction Inside : 2.670000E-01

Receptor Information

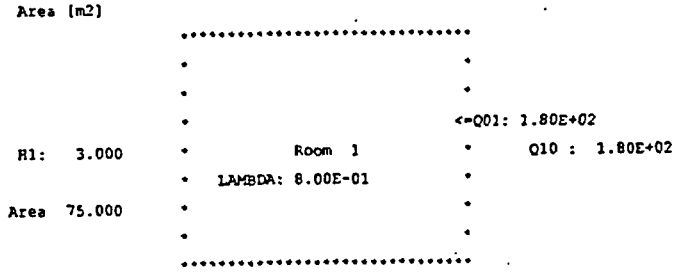
Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	7.500	2.500	1.000	1.000	3.36E+01	0.00E+00

Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete
1	2	2.40E+00	0.00E+00	Concrete
1	3	2.40E+00	0.00E+00	Concrete
1	4	2.40E+00	0.00E+00	Concrete
1	5	2.40E+00	0.00E+00	Concrete
1	6	2.40E+00	0.00E+00	Concrete

-------- Building Information --------

Building Air Exchange Rate: 8.00E-01 1/hr



Deposition velocity: 2.70E-06 [m/s] Resuspension Rate: 1.40E-05 [1/s]

======== Source Information ========

Source: 1

Location:: Room : 1 x: 0.00 y: 2.50 z: 1.50[m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
FE-55	1.000E-10	6.070E-07	2.690E-06	0.000E+00

Source: 2

Location:: Room : 1 x: 15.00 y: 2.50 z: 1.50[m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
FE-55	1.000E-10	6.070E-07	2.690E-06	0.000E+00

Source: 3

Location:: Room : 1 x: 7.50 y: 0.00 z: 1.50[m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
FE-55	1.000E-10	6.070E-07	2.690E-06	0.000E+00

Source: 4

Location:: Room : 1 x: 7.50 y: 5.00 z: 1.50[m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
FE-55	1.000E-10	6.070E-07	2.690E-06	0.000E+00

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Flum Brook 25th HL CORE MIX.bld

Source: 5

Location:: Room : 1 x: 7.50 y: 2.50 z: 0.00[m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Radon Release Fraction: 0.000E+00

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
	[pCi/m2]	Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/ (pCi/m3)]
PU-241	8.100E-01	6.850E-05	8.250E-03	2.560E-08
AM-241	4.100E-01	3.640E-03	4.440E-01	9.570E-05
PU-239	5.900E-01	3.540E-03	4.290E-01	4.960E-07
PU-238	6.000E-02	3.200E-03	3.920E-01	5.710E-07
NP-237	0.000E+00	4.440E-03	5.400E-01	1.210E-03
U-238	1.100E-01	2.690E-04	1.180E-01	1.600E-04
U-235	1.000E-02	2.670E-04	1.230E-01	9.030E-04
U-234	1.400E-01	2.830E-04	1.320E-01	8.930E-07
U-233	0.000E+00	2.890E-04	1.350E-01	1.910E-06
PA-231	0.000E+00	1.060E-02	1.280E+00	2.010E-04
TH-230	0.000E+00	5.480E-04	3.260E-01	2.040E-06
TH-229	0.000E+00	4.030E-03	2.160E+00	1.720E-03
AC-227	0.000E+00	1.480E-02	6.720E+00	2.160E-03
RA-226	0.000E+00	1.330E-03	8.600E-03	1.040E-02
PB-210	0.000E+00	5.370E-03	1.380E-02	1.050E-05
SR-90	1.320E+01	1.530E-04	1.310E-03	2.310E-05
NI-63	3.090E+00	5.770E-07	6.290E-06	0.000E+00

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th HL CORE MIX.bld

Source: 6
Location:: Room : 1 x: 7.50 y: 2.50 z: 3.00[m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
FE-55	1.000E-10	6.070E-07	2.690E-06	0.000E+00

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th HL CORE MIX.bld
Evaluation Time: 0.00000000E+00 years

==========
==========
=== Assessment for Time: 1 ===
=== Time =0.00E+00 yr ===
==========
==========

-------- Source Information --------

Source: 1
Location:: Room : 1 x: 0.00 y: 2.50 z: 1.50 [m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination:: Nuclide Concentration
[pCi/m2]
FE-55 1.000E-10

Source: 2
Location:: Room : 1 x: 15.00 y: 2.50 z: 1.50 [m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination:: Nuclide Concentration
[pCi/m2]
FE-55 1.000E-10

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th HL CORE MIX.bld
Evaluation Time: 0.00000000E+00 years

Source: 3
Location:: Room : 1 x: 7.50 y: 0.00 z: 1.50 [m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	FE-55	1.000E-10

Source: 4
Location:: Room : 1 x: 7.50 y: 5.00 z: 1.50 [m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	FE-55	1.000E-10

Source: 5
Location:: Room : 1 x: 7.50 y: 2.50 z: 0.00 [m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	PU-241	8.100E-01
	AM-241	4.100E-01

PU-239	5.900E-01
PU-238	6.000E-02
NP-237	0.000E+00
U-238	1.100E-01
U-235	1.000E-02
U-234	1.400E-01
U-233	0.000E+00
PA-231	0.000E+00
TH-230	0.000E+00
TH-229	0.000E+00
AC-227	0.000E+00
RA-226	0.000E+00
PB-210	0.000E+00
SR-90	1.320E+01
NI-63	3.090E+00

Source: 6
Location:: Room : 1 x: 7.50 y: 2.50 z: 3.00 [m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	FE-55	1.000E-10

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th HL CORE MIX.bld
Evaluation Time: 0.00000000E+00 years

RESRAD-BUILDDose Tables

Source Contributions to Receptor Doses

(mrem)

	Source 1	Source 2	Source 3	Source 4	Source 5	Source 6	Total
Receptor 1	7.68E-20	7.68E-20	2.30E-19	2.30E-19	5.39E-05	3.84E-19	5.39E-05
Total	7.68E-20	7.68E-20	2.30E-19	2.30E-19	5.39E-05	3.84E-19	5.39E-05

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th HL CORE MIX.bld
Evaluation Time: 0.00000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	1.04E-21	0.00E+00	7.58E-20
Total	0.00E+00	0.00E+00	0.00E+00	1.04E-21	0.00E+00	7.58E-20

Source: 2

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	1.04E-21	0.00E+00	7.58E-20
Total	0.00E+00	0.00E+00	0.00E+00	1.04E-21	0.00E+00	7.58E-20

Source: 3

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	3.11E-21	0.00E+00	2.27E-19
Total	0.00E+00	0.00E+00	0.00E+00	3.11E-21	0.00E+00	2.27E-19

Source: 4

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	3.11E-21	0.00E+00	2.27E-19
Total	0.00E+00	0.00E+00	0.00E+00	3.11E-21	0.00E+00	2.27E-19

Source: 5

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	9.18E-07	1.18E-15	6.57E-13	1.13E-05	1.59E-22	4.17E-05
Total	9.18E-07	1.18E-15	6.57E-13	1.13E-05	1.59E-22	4.17E-05

Source: 6

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	5.19E-21	0.00E+00	3.79E-19
Total	0.00E+00	0.00E+00	0.00E+00	5.19E-21	0.00E+00	3.79E-19

Title : Flumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Flum Brook 25th HL CORE MIX.bld
Evaluation Time: 0.00000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor 1	Total
FE-55		
FE-55	7.68E-20	7.68E-20

Source: 2

Nuclide	Receptor 1	Total
FE-55		
FE-55	7.68E-20	7.68E-20

Source: 3

Nuclide	Receptor 1	Total
FE-55		
FE-55	2.30E-19	2.30E-19

Source: 4

Nuclide	Receptor 1	Total
FE-55		
FE-55	2.30E-19	2.30E-19

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th HL CORE MIX.bld
Evaluation Time: 0.00000000E+00 years

Source: 5

Nuclide	Receptor 1	Total
PU-241		
PU-241	5.26E-07	5.26E-07
AM-241	2.29E-08	2.29E-08
NP-237	3.14E-15	3.14E-15
U-233	3.80E-22	3.80E-22
TH-229	1.14E-25	1.14E-25
AM-241		
AM-241	1.47E-05	1.47E-05
NP-237	3.01E-12	3.01E-12
U-233	4.84E-19	4.84E-19
TH-229	1.80E-22	1.80E-22
PU-239		
PU-239	2.03E-05	2.03E-05
U-235	1.81E-15	1.81E-15
PA-231	2.11E-19	2.11E-19
AC-227	4.13E-21	4.13E-21
PU-238		
PU-238	1.87E-06	1.87E-06
U-234	4.16E-13	4.16E-13
TH-230	2.80E-18	2.80E-18
RA-226	6.97E-22	6.97E-22
PB-210	6.52E-24	6.52E-24
U-238		
U-238	5.29E-07	5.29E-07
U-234	7.65E-13	7.65E-13
TH-230	5.15E-18	5.15E-18
RA-226	1.28E-21	1.28E-21
PB-210	1.20E-23	1.20E-23
U-235		
U-235	6.24E-08	6.24E-08
PA-231	1.09E-11	1.09E-11
AC-227	2.84E-13	2.84E-13
U-234		
U-234	6.87E-07	6.87E-07
TH-230	6.94E-12	6.94E-12
RA-226	2.30E-15	2.30E-15
PB-210	2.68E-17	2.68E-17
SR-90		
SR-90	1.52E-05	1.52E-05
NI-63		
NI-63	1.30E-08	1.30E-08

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th HL CORE MIX.bld
Evaluation Time: 0.00000000E+00 years

Source: 6

Nuclide	Receptor 1	Total
FE-55		
FE-55	3.84E-19	3.84E-19

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 25th HL CORE MIX.bld
Full Summary

RESRAD-BUILD Dose (Time) Tables

Receptor Dose Received for the Exposure Duration

(mrem)

	Evaluation Time [yr] 0.00E+00
1	5.39E-05

Receptor Dose/Yr Averaged Over Exposure Duration

(mrem/yr)

	Evaluation Time [yr] 0.00E+00
1	5.39E-05

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th HL CORE MIX.bld

RESRAD-BUILD Table of Contents

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th HL CORE MIX.bld

RESRAD-BUILD Input Parameters

Number of Sources : 6
Number of Receptors: 1
Total Time : 3.652500E+02 days
Fraction Inside : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	7.500	2.500	1.000	1.000	3.36E+01	0.00E+00

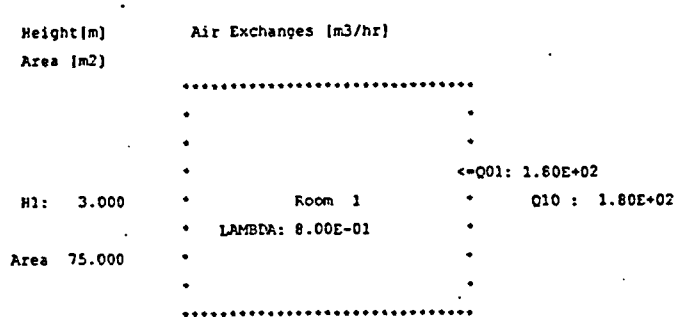
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete
1	2	2.40E+00	0.00E+00	Concrete
1	3	2.40E+00	0.00E+00	Concrete
1	4	2.40E+00	0.00E+00	Concrete
1	5	2.40E+00	0.00E+00	Concrete
1	6	2.40E+00	0.00E+00	Concrete

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th HL CORE MIX.bld

-------- Building Information --------

Building Air Exchange Rate: 8.00E-01 1/hr



Deposition velocity: 2.70E-06 [m/s] Resuspension Rate: 1.40E-05 [1/s]

======== Source Information ========

Source: 1
Location:: Room : 1 x: 0.00 y: 2.50 z: 1.50[m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
EU-154	1.000E-10	9.550E-06	2.860E-04	7.180E-03

Source: 2

Location:: Room : 1 x: 15.00 y: 2.50 z: 1.50[m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::-

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
EU-154	1.000E-10	9.550E-06	2.860E-04	7.180E-03

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th HL CORE MIX.bld

Source: 3
Location:: Room : 1 x: 7.50 y: 0.00 z: 1.50[m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
EU-154	1.000E-10	9.550E-06	2.860E-04	7.180E-03

Source: 4
Location:: Room : 1 x: 7.50 y: 5.00 z: 1.50[m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
EU-154	1.000E-10	9.550E-06	2.860E-04	7.180E-03

Source: 5

Location:: Room : 1 x: 7.50 y: 2.50 z: 0.00[m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	*Inhalation*	*Submersion*
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
CS-137	7.800E+01	5.000E-05	3.190E-05	3.190E-03
CO-60	6.500E-01	2.690E-05	2.190E-04	1.470E-02

Source: 6

Location:: Room : 1 x: 7.50 y: 2.50 z: 3.00[m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	*Inhalation*	*Submersion*
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
EU-154	1.000E-10	9.550E-06	2.860E-04	7.180E-03

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th HL CORE MIX.bld
Evaluation Time: 0.00000000E+00 years

=== Assessment for Time: 1 ===
=== Time =0.00E+00 yr ===

-------- Source Information --------

Source: 1
Location:: Room : 1 x: 0.00 y: 2.50 z: 1.50 [m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination:: Nuclide Concentration [pCi/m2]
EU-154 1.000E-10

Source: 2
Location:: Room : 1 x: 15.00 y: 2.50 z: 1.50 [m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination:: Nuclide Concentration [pCi/m2]
EU-154 1.000E-10

Title : Flumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Flum Brook 75th HL CORE MIX.bld
Evaluation Time: 0.00000000E+00 years

Source: 3
Location:: Room : 1 x: 7.50 y: 0.00 z: 1.50 [m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	EU-154	1.000E-10

Source: 4
Location:: Room : 1 x: 7.50 y: 5.00 z: 1.50 [m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	EU-154	1.000E-10

Source: 5
Location:: Room : 1 x: 7.50 y: 2.50 z: 0.00 [m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	CS-137	7.800E+01
	CO-60	6.500E-01

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th HL CORE MIX.bld
Evaluation Time: 0.00000000E+00 years

Source: 6
Location:: Room : 1 x: 7.50 y: 2.50 z: 3.00 [m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 7.000E-02
Removable fraction: 1.000E-01
Time to Remove: 5.270E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	EU-154	1.000E-10

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook 75th HL CORE MIX.bld
Evaluation Time: 0.00000000E+00 years

RESRAD-BUILDDose Tables

Source Contributions to Receptor Doses

[mrem]

	Source 1	Source 2	Source 3	Source 4	Source 5	Source 6	Total
Receptor 1	1.29E-16	1.29E-16	1.88E-15	1.88E-15	4.48E-04	3.09E-15	4.48E-04
Total	1.29E-16	1.29E-16	1.88E-15	1.88E-15	4.48E-04	3.09E-15	4.48E-04

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Flum Brook 75th HL CORE MIX.bld
Evaluation Time: 0.00000000E+00 years

Pathway Detail of Doses

(mrem)

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.28E-16	4.55E-25	8.52E-23	4.16E-20	0.00E+00	1.31E-18
Total	1.28E-16	4.55E-25	8.52E-23	4.16E-20	0.00E+00	1.31E-18

Source: 2

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.28E-16	4.55E-25	8.52E-23	4.16E-20	0.00E+00	1.31E-18
Total	1.28E-16	4.55E-25	8.52E-23	4.16E-20	0.00E+00	1.31E-18

Source: 3

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.88E-15	1.36E-24	2.56E-22	1.25E-19	0.00E+00	3.92E-18
Total	1.88E-15	1.36E-24	2.56E-22	1.25E-19	0.00E+00	3.92E-18

Source: 4

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.88E-15	1.36E-24	2.56E-22	1.25E-19	0.00E+00	3.92E-18
Total	1.88E-15	1.36E-24	2.56E-22	1.25E-19	0.00E+00	3.92E-18

Source: 5

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	4.20E-04	1.87E-13	1.57E-10	1.96E-08	0.00E+00	2.76E-05
Total	4.20E-04	1.87E-13	1.57E-10	1.96E-08	0.00E+00	2.76E-05

Source: 6

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	3.09E-15	2.27E-24	4.26E-22	2.08E-19	0.00E+00	6.54E-18
Total	3.09E-15	2.27E-24	4.26E-22	2.08E-19	0.00E+00	6.54E-18

Title : Flumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Flum Brook 75th ML CORE MIX.bld
Evaluation Time: 0.00000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor 1	Total
EU-154		
EU-154	1.29E-16	1.29E-16

Source: 2

Nuclide	Receptor 1	Total
EU-154		
EU-154	1.29E-16	1.29E-16

Source: 3

Nuclide	Receptor 1	Total
EU-154		
EU-154	1.88E-15	1.88E-15

Source: 4

Nuclide	Receptor 1	Total
EU-154		
EU-154	1.88E-15	1.88E-15

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Flum Brook 75th HL CORE MIX.bld
Evaluation Time: 0.00000000E+00 years

Source: 5

Nuclide	Receptor 1	Total
CS-137		
CS-137	4.34E-04	4.34E-04
CO-60		
CO-60	1.36E-05	1.36E-05

Source: 6

Nuclide	Receptor 1	Total
EU-154		
EU-154	3.09E-15	3.09E-15

Title : Flumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Flum Brook 75th HL CORE MIX.bld
Full Summary

RESRAD-BUILD Dose (Time) Tables

Receptor Dose Received for the Exposure Duration

(mrem)

	Evaluation Time [yr] 0.00E+00
1	4.48E-04

Receptor Dose/Yr Averaged Over Exposure Duration

(mrem/yr)

	Evaluation Time [yr] 0.00E+00
1	4.48E-04

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 HL CORE MIX.bld

RESRAD-BUILD Table of Contents

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Flum Brook H-3 HL CORE MIX.bld

RESRAD-BUILD Input Parameters

Number of Sources : 6
Number of Receptors: 1
Total Time : 3.652500E+02 days
Fraction Inside : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	7.500	2.500	1.000	1.000	3.36E-01	0.00E+00

Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete
1	2	2.40E+00	0.00E+00	Concrete
1	3	2.40E+00	0.00E+00	Concrete
1	4	2.40E+00	0.00E+00	Concrete
1	5	2.40E+00	0.00E+00	Concrete
1	6	2.40E+00	0.00E+00	Concrete

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 HL CORE MIX.bld

-------- Building Information --------

Building Air Exchange Rate: 8.00E-01 1/hr

Deposition velocity: 2.70E-06 (m/s) Resuspension Rate: 1.40E-05 (1/s)

======== Source Information ========

Source: 1

Location:: Room : 1 x: 0.00 y: 2.50 z: 1.50[m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration [pCi/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/(pCi/m3)]
H-3	1.000E-10	6.400E-08	6.400E-08	0.000E+00

Source: 2

Location:: Room : 1 x: 15.00 y: 2.50 z: 1.50[m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration [pCi/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/(pCi/m3)]
H-3	1.000E-10	6.400E-08	6.400E-08	0.000E+00

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 HL CORE MIX.bld

Source: 3
Location:: Room : 1 x: 7.50 y: 0.00 z: 1.50[m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
H-3	1.000E-10	6.400E-08	6.400E-06	0.000E+00

Source: 4
Location:: Room : 1 x: 7.50 y: 5.00 z: 1.50[m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.620E+04 [day]

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
H-3	1.000E-10	6.400E-06	6.400E-08	0.000E+00

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 HL CORE MIX.bld

Source: 5
Location:: Room : 1 x: 7.50 y: 2.50 z: 0.00[m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration [pCi/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/(pCi/m3)]
H-3	6.300E-01	6.400E-08	6.400E-08	0.000E+00

Source: 6
Location:: Room : 1 x: 7.50 y: 2.50 z: 3.00[m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::

Nuclide	Concentration [pCi/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/(pCi/m3)]
H-3	1.000E-10	6.400E-08	6.400E-08	0.000E+00

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 HL CORE MIX.bld
Evaluation Time: 0.00000000E+00 years

Assessment for Time: 1
Time =0.00E+00 yr

-------- Source Information --------

Source: 1
Location:: Room : 1 x: 0.00 y: 2.50 z: 1.50 [m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination:: Nuclide Concentration [pCi/m2]
H-3 1.000E-10

Source: 2
Location:: Room : 1 x: 15.00 y: 2.50 z: 1.50 [m]
Geometry:: Type: Area Area:1.50E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination:: Nuclide Concentration [pCi/m2]
H-3 1.000E-10

Source: 3
Location:: Room : 1 x: 7.50 y: 0.00 z: 1.50 [m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	H-3	1.000E-10

Source: 4
Location:: Room : 1 x: 7.50 y: 5.00 z: 1.50 [m]
Geometry:: Type: Area Area:4.50E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	H-3	1.000E-10

Source: 5
Location:: Room : 1 x: 7.50 y: 2.50 z: 0.00 [m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	H-3	5.300E-01

Title : Flumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Flum Brook H-3 HL CORE MIX.bld
Evaluation Time: 0.00000000E+00 years

Source: 6
Location:: Room : 1 x: 7.50 y: 2.50 z: 3.00 [m]
Geometry:: Type: Area Area:7.50E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 4.070E-07 [1/hr]
Fraction released to air: 1.000E+00
Removable fraction: 1.000E-01
Time to Remove: 1.820E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	H-3	1.000E-10

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 HL CORE MIX.bld
Evaluation Time: 0.00000000E+00 years

RESRAD-BUILDDose Tables

Source Contributions to Receptor Doses

[mrem]

	Source 1	Source 2	Source 3	Source 4	Source 5	Source 6	Total
Receptor 1	9.39E-21	9.39E-21	2.82E-20	2.82E-20	3.90E-10	4.69E-20	3.90E-10
Total	9.39E-21	9.39E-21	2.82E-20	2.82E-20	3.90E-10	4.69E-20	3.90E-10

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 HL CORE MIX.bld
Evaluation Time: 0.00000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	5.84E-22	0.00E+00	8.80E-21
Total	0.00E+00	0.00E+00	0.00E+00	5.84E-22	0.00E+00	8.80E-21

Source: 2

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	5.84E-22	0.00E+00	8.80E-21
Total	0.00E+00	0.00E+00	0.00E+00	5.84E-22	0.00E+00	8.80E-21

Source: 3

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	1.75E-21	0.00E+00	2.64E-20
Total	0.00E+00	0.00E+00	0.00E+00	1.75E-21	0.00E+00	2.64E-20

Source: 4

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	1.75E-21	0.00E+00	2.64E-20
Total	0.00E+00	0.00E+00	0.00E+00	1.75E-21	0.00E+00	2.64E-20

Source: 5

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	2.42E-11	0.00E+00	3.65E-10
Total	0.00E+00	0.00E+00	0.00E+00	2.42E-11	0.00E+00	3.65E-10

Source: 6

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	2.92E-21	0.00E+00	4.40E-20
Total	0.00E+00	0.00E+00	0.00E+00	2.92E-21	0.00E+00	4.40E-20

Title : Flumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Flum Brook H-3 HL CORE MIX.bld
Evaluation Time: 0.00000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor 1	Total
H-3		
H-3	9.39E-21	9.39E-21

Source: 2

Nuclide	Receptor 1	Total
H-3		
H-3	9.39E-21	9.39E-21

Source: 3

Nuclide	Receptor 1	Total
H-3		
H-3	2.82E-20	2.82E-20

Source: 4

Nuclide	Receptor 1	Total
H-3		
H-3	2.82E-20	2.82E-20

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Plum Brook H-3 HL CORE MIX.bld
Evaluation Time: 0.00000000E+00 years

Source: 5

Nuclide	Receptor 1	Total
H-3		
H-3	3.90E-10	3.90E-10

Source: 6

Nuclide	Receptor 1	Total
H-3		
H-3	4.69E-20	4.69E-20

Title : Plumbrook Duplicate
Input File : C:\Program Files\RESRAD_Family\BUILD\Flum Brook H-2 HL CORE MIX.bld
Summary

RESRAD-BUILD Dose (Time) Tables

Receptor Dose Received for the Exposure Duration

(mrem)

	Evaluation Time (yr) 0.00E+00
1	3.90E-10

Receptor Dose/Yr Averaged Over Exposure Duration

(mrem/yr)

	Evaluation Time (yr) 0.00E+00
1	3.90E-10

Summary : RESRAD Default Parameters
File : Plumbrook Subsurface Modified HL CORE MIX.RAD

Table of Contents

Part I: Mixture Sums and Single Radionuclide Guidelines

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

Menu	Parameter	Current Value	Default	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	6.720E+00	6.720E+00	DCF2(1)
B-1	Am-241	4.440E-01	4.440E-01	DCF2(2)
B-1	Am-243+D	4.400E-01	4.400E-01	DCF2(3)
B-1	C-14	2.090E-06	2.090E-06	DCF2(4)
B-1	Cm-243	3.070E-01	3.070E-01	DCF2(5)
B-1	Cm-245	4.550E-01	4.550E-01	DCF2(7)
B-1	Co-60	2.190E-04	2.190E-04	DCF2(9)
B-1	Cs-134	4.630E-05	4.630E-05	DCF2(10)
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2(11)
B-1	Eu-152	2.210E-04	2.210E-04	DCF2(12)
B-1	Eu-154	2.860E-04	2.860E-04	DCF2(14)
B-1	Eu-155	4.140E-05	4.140E-05	DCF2(15)
B-1	Fe-55	2.690E-06	2.690E-06	DCF2(16)
B-1	Gd-152	2.430E-01	2.430E-01	DCF2(17)
B-1	H-3	6.400E-08	6.400E-08	DCF2(18)
B-1	I-129	1.740E-04	1.740E-04	DCF2(19)
B-1	Na-22	7.660E-06	7.660E-06	DCF2(20)
B-1	Nb-94	4.140E-04	4.140E-04	DCF2(21)
B-1	Ni-59	2.700E-06	2.700E-06	DCF2(22)
B-1	Ni-63	6.290E-06	6.290E-06	DCF2(23)
B-1	Np-237+D	5.400E-01	5.400E-01	DCF2(24)
B-1	Pa-231	1.280E+00	1.280E+00	DCF2(25)
B-1	Pb-210+D	2.320E-02	2.320E-02	DCF2(26)
B-1	Pu-238	3.920E-01	3.920E-01	DCF2(27)
B-1	Pu-239	4.290E-01	4.290E-01	DCF2(28)
B-1	Pu-241+D	8.250E-03	8.250E-03	DCF2(29)
B-1	Pu-242	4.110E-01	4.110E-01	DCF2(31)
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF2(32)
B-1	Ra-228+D	5.080E-03	5.080E-03	DCF2(33)
B-1	Sr-90+D	1.310E-03	1.310E-03	DCF2(34)
B-1	Tc-99	8.330E-06	8.330E-06	DCF2(35)
B-1	Th-228+D	3.450E-01	3.450E-01	DCF2(36)
B-1	Th-229+D	2.160E+00	2.160E+00	DCF2(37)
B-1	Th-230	3.260E-01	3.260E-01	DCF2(38)
B-1	Th-232	1.640E+00	1.640E+00	DCF2(39)
B-1	U-233	1.350E-01	1.350E-01	DCF2(40)
B-1	U-234	1.320E-01	1.320E-01	DCF2(41)
B-1	U-235+D	1.230E-01	1.230E-01	DCF2(42)
B-1	U-236	1.250E-01	1.250E-01	DCF2(43)
B-1	U-238+D	1.180E-01	1.180E-01	DCF2(44)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	1.480E-02	1.480E-02	DCF3(1)
D-1	Am-241	3.640E-03	3.640E-03	DCF3(2)
D-1	Am-243+D	3.630E-03	3.630E-03	DCF3(3)
D-1	C-14	2.090E-06	2.090E-06	DCF3(4)
D-1	Cm-243	2.510E-03	2.510E-03	DCF3(5)
D-1	Cm-245	3.740E-03	3.740E-03	DCF3(7)
D-1	Co-60	2.690E-05	2.690E-05	DCF3(9)

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

Menu	Parameter	Current Value	Default	Parameter Name
D-1	Cs-134	7.330E-05	7.330E-05	DCF3(10)
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3(11)
D-1	Eu-152	6.480E-06	6.480E-06	DCF3(12)
D-1	Eu-154	9.550E-06	9.550E-06	DCF3(14)
D-1	Eu-155	1.530E-06	1.530E-06	DCF3(15)
D-1	Fe-55	6.070E-07	6.070E-07	DCF3(16)
D-1	Gd-152	1.610E-04	1.610E-04	DCF3(17)
D-1	H-3	6.400E-08	6.400E-08	DCF3(18)
D-1	I-129	2.760E-04	2.760E-04	DCF3(19)
D-1	Na-22	1.150E-05	1.150E-05	DCF3(20)
D-1	Nb-94	7.140E-06	7.140E-06	DCF3(21)
D-1	Ni-59	2.100E-07	2.100E-07	DCF3(22)
D-1	Ni-63	5.770E-07	5.770E-07	DCF3(23)
D-1	Np-237+D	4.440E-03	4.440E-03	DCF3(24)
D-1	Pa-231	1.060E-02	1.060E-02	DCF3(25)
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF3(26)
D-1	Pu-238	3.200E-03	3.200E-03	DCF3(27)
D-1	Pu-239	3.540E-03	3.540E-03	DCF3(28)
D-1	Pu-241+D	6.850E-05	6.850E-05	DCF3(29)
D-1	Pu-242	3.360E-03	3.360E-03	DCF3(31)
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF3(32)
D-1	Ra-228+D	1.440E-03	1.440E-03	DCF3(33)
D-1	Sr-90+D	1.530E-04	1.530E-04	DCF3(34)
D-1	Tc-99	1.460E-06	1.460E-06	DCF3(35)
D-1	Th-228+D	8.080E-04	8.080E-04	DCF3(36)
D-1	Th-229+D	4.030E-03	4.030E-03	DCF3(37)
D-1	Th-230	5.480E-04	5.480E-04	DCF3(38)
D-1	Th-232	2.730E-03	2.730E-03	DCF3(39)
D-1	U-233	2.890E-04	2.890E-04	DCF3(40)
D-1	U-234	2.830E-04	2.830E-04	DCF3(41)
D-1	U-235+D	2.670E-04	2.670E-04	DCF3(42)
D-1	U-236	2.690E-04	2.690E-04	DCF3(43)
D-1	U-238+D	2.690E-04	2.690E-04	DCF3(44)
D-34	Food transfer factors:			
D-34	Ac-227+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(1,1)
D-34	Ac-227+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,2)
D-34	Ac-227+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,3)
D-34				
D-34	Am-241 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(2,1)
D-34	Am-241 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-05	5.000E-05	RTF(2,2)
D-34	Am-241 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(2,3)
D-34				
D-34	Am-243+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(3,1)
D-34	Am-243+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-05	5.000E-05	RTF(3,2)
D-34	Am-243+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(3,3)
D-34	C-14 , plant/soil concentration ratio, dimensionless	5.500E+00	5.500E+00	RTF(4,1)
D-34	C-14 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.100E-02	3.100E-02	RTF(4,2)
D-34	C-14 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.200E-02	1.200E-02	RTF(4,3)

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

Menu	Parameter	Current Value	Default	Parameter Name
D-34	Cm-243 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(5,1)
D-34	Cm-243 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(5,2)
D-34	Cm-243 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(5,3)
D-34				
D-34	Cm-245 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(7,1)
D-34	Cm-245 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(7,2)
D-34	Cm-245 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(7,3)
D-34				
D-34	Co-60 , plant/soil concentration ratio, dimensionless	8.000E-02	8.000E-02	RTF(9,1)
D-34	Co-60 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-02	2.000E-02	RTF(9,2)
D-34	Co-60 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(9,3)
D-34				
D-34	Cs-134 , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(10,1)
D-34	Cs-134 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(10,2)
D-34	Cs-134 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(10,3)
D-34				
D-34	Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(11,1)
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(11,2)
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(11,3)
D-34				
D-34	Eu-152 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(12,1)
D-34	Eu-152 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(12,2)
D-34	Eu-152 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(12,3)
D-34				
D-34	Eu-154 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(14,1)
D-34	Eu-154 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(14,2)
D-34	Eu-154 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(14,3)
D-34				
D-34	Eu-155 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(15,1)
D-34	Eu-155 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(15,2)
D-34	Eu-155 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(15,3)
D-34				
D-34	Fe-55 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(16,1)
D-34	Fe-55 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-02	2.000E-02	RTF(16,2)
D-34	Fe-55 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(16,3)
D-34				
D-34	Gd-152 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(17,1)
D-34	Gd-152 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(17,2)
D-34	Gd-152 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(17,3)
D-34				
D-34	H-3 , plant/soil concentration ratio, dimensionless	4.800E+00	4.800E+00	RTF(18,1)
D-34	H-3 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.200E-02	1.200E-02	RTF(18,2)
D-34	H-3 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-02	1.000E-02	RTF(18,3)
D-34				
D-34	I-129 , plant/soil concentration ratio, dimensionless	2.000E-02	2.000E-02	RTF(19,1)
D-34	I-129 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	7.000E-03	7.000E-03	RTF(19,2)
D-34	I-129 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-02	1.000E-02	RTF(19,3)
D-34				

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

Menu	Parameter	Current Value	Default	Parameter Name
D-34	Na-22 , plant/soil concentration ratio, dimensionless	5.000E-02	5.000E-02	RTF(20,1)
D-34	Na-22 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-02	8.000E-02	RTF(20,2)
D-34	Na-22 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	4.000E-02	4.000E-02	RTF(20,3)
D-34				
D-34	Nb-94 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(21,1)
D-34	Nb-94 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-07	3.000E-07	RTF(21,2)
D-34	Nb-94 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(21,3)
D-34				
D-34	Ni-59 , plant/soil concentration ratio, dimensionless	5.000E-02	5.000E-02	RTF(22,1)
D-34	Ni-59 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(22,2)
D-34	Ni-59 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-02	2.000E-02	RTF(22,3)
D-34				
D-34	Ni-63 , plant/soil concentration ratio, dimensionless	5.000E-02	5.000E-02	RTF(23,1)
D-34	Ni-63 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(23,2)
D-34	Ni-63 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-02	2.000E-02	RTF(23,3)
D-34				
D-34	Np-237+D , plant/soil concentration ratio, dimensionless	2.000E-02	2.000E-02	RTF(24,1)
D-34	Np-237+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(24,2)
D-34	Np-237+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(24,3)
D-34				
D-34	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(25,1)
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(25,2)
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(25,3)
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(26,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(26,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(26,3)
D-34				
D-34	Pu-238 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(27,1)
D-34	Pu-238 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(27,2)
D-34	Pu-238 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(27,3)
D-34				
D-34	Pu-239 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(28,1)
D-34	Pu-239 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(28,2)
D-34	Pu-239 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(28,3)
D-34				
D-34	Pu-241+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(29,1)
D-34	Pu-241+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(29,2)
D-34	Pu-241+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(29,3)
D-34				
D-34	Pu-242 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(31,1)
D-34	Pu-242 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(31,2)
D-34	Pu-242 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(31,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(32,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(32,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(32,3)
D-34				

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

Menu	Parameter	Current Value	Default	Parameter Name
D-34	Ra-228+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(33,1)
D-34	Ra-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(33,2)
D-34	Ra-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(33,3)
D-34				
D-34	Sr-90+D , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF(34,1)
D-34	Sr-90+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-03	8.000E-03	RTF(34,2)
D-34	Sr-90+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(34,3)
D-34				
D-34	Tc-99 , plant/soil concentration ratio, dimensionless	5.000E+00	5.000E+00	RTF(35,1)
D-34	Tc-99 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(35,2)
D-34	Tc-99 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(35,3)
D-34				
D-34	Th-228+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(36,1)
D-34	Th-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(36,2)
D-34	Th-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(36,3)
D-34				
D-34	Th-229+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(37,1)
D-34	Th-229+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(37,2)
D-34	Th-229+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(37,3)
D-34				
	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(38,1)
	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(38,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(38,3)
D-34				
D-34	Th-232 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(39,1)
D-34	Th-232 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(39,2)
D-34	Th-232 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(39,3)
D-34				
D-34	U-233 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(40,1)
D-34	U-233 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(40,2)
D-34	U-233 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(40,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(41,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(41,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(41,3)
D-34				
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(42,1)
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(42,2)
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(42,3)
D-34				
D-34	U-236 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(43,1)
D-34	U-236 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(43,2)
D-34	U-236 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(43,3)
D-34				
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(44,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(44,2)
	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(44,3)

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

Menu	Parameter	Current Value	Default	Parameter Name
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Ac-227+D , fish	1.500E+01	1.500E+01	BIOFAC(1,1)
D-5	Ac-227+D , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(1,2)
D-5				
D-5	Am-241 , fish	3.000E+01	3.000E+01	BIOFAC(2,1)
D-5	Am-241 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(2,2)
D-5				
D-5	Am-243+D , fish	3.000E+01	3.000E+01	BIOFAC(3,1)
D-5	Am-243+D , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(3,2)
D-5				
D-5	C-14 , fish	5.000E+04	5.000E+04	BIOFAC(4,1)
D-5	C-14 , crustacea and mollusks	9.100E+03	9.100E+03	BIOFAC(4,2)
D-5				
D-5	Cm-243 , fish	3.000E+01	3.000E+01	BIOFAC(5,1)
D-5	Cm-243 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(5,2)
D-5				
D-5	Cm-245 , fish	3.000E+01	3.000E+01	BIOFAC(7,1)
D-5	Cm-245 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(7,2)
D-5				
D-5	Co-60 , fish	3.000E+02	3.000E+02	BIOFAC(9,1)
D-5	Co-60 , crustacea and mollusks	2.000E+02	2.000E+02	BIOFAC(9,2)
D-5				
D-5	Cs-134 , fish	2.000E+03	2.000E+03	BIOFAC(10,1)
D-5	Cs-134 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(10,2)
D-5				
D-5	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC(11,1)
D-5	Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(11,2)
D-5				
D-5	Eu-152 , fish	5.000E+01	5.000E+01	BIOFAC(12,1)
D-5	Eu-152 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(12,2)
D-5				
D-5	Eu-154 , fish	5.000E+01	5.000E+01	BIOFAC(14,1)
D-5	Eu-154 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(14,2)
D-5				
D-5	Eu-155 , fish	5.000E+01	5.000E+01	BIOFAC(15,1)
D-5	Eu-155 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(15,2)
D-5				
D-5	Fe-55 , fish	2.000E+02	2.000E+02	BIOFAC(16,1)
D-5	Fe-55 , crustacea and mollusks	3.200E+03	3.200E+03	BIOFAC(16,2)
D-5				
D-5	Gd-152 , fish	2.500E+01	2.500E+01	BIOFAC(17,1)
D-5	Gd-152 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(17,2)
D-5				
D-5	H-3 , fish	1.000E+00	1.000E+00	BIOFAC(18,1)
D-5	H-3 , crustacea and mollusks	1.000E+00	1.000E+00	BIOFAC(18,2)
D-5				
D-5	I-129 , fish	4.000E+01	4.000E+01	BIOFAC(19,1)
D-5	I-129 , crustacea and mollusks	5.000E+00	5.000E+00	BIOFAC(19,2)
D-5				

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

Menu	Parameter	Current Value	Default	Parameter Name
D-5	Na-22 , fish	2.000E+01	2.000E+01	BIOFAC(20,1)
D-5	Na-22 , crustacea and mollusks	2.000E+02	2.000E+02	BIOFAC(20,2)
D-5				
D-5	Nb-94 , fish	3.000E+02	3.000E+02	BIOFAC(21,1)
D-5	Nb-94 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(21,2)
D-5				
D-5	Ni-59 , fish	1.000E+02	1.000E+02	BIOFAC(22,1)
D-5	Ni-59 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(22,2)
D-5				
D-5	Ni-63 , fish	1.000E+02	1.000E+02	BIOFAC(23,1)
D-5	Ni-63 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(23,2)
D-5				
D-5	Np-237+D , fish	3.000E+01	3.000E+01	BIOFAC(24,1)
D-5	Np-237+D , crustacea and mollusks	4.000E+02	4.000E+02	BIOFAC(24,2)
D-5				
D-5	Pa-231 , fish	1.000E+01	1.000E+01	BIOFAC(25,1)
D-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(25,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(26,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(26,2)
	Pu-238 , fish	3.000E+01	3.000E+01	BIOFAC(27,1)
D-5	Pu-238 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(27,2)
D-5				
D-5	Pu-239 , fish	3.000E+01	3.000E+01	BIOFAC(28,1)
D-5	Pu-239 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(28,2)
D-5				
D-5	Pu-241+D , fish	3.000E+01	3.000E+01	BIOFAC(29,1)
D-5	Pu-241+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(29,2)
D-5				
D-5	Pu-242 , fish	3.000E+01	3.000E+01	BIOFAC(31,1)
D-5	Pu-242 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(31,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(32,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(32,2)
D-5				
D-5	Ra-228+D , fish	5.000E+01	5.000E+01	BIOFAC(33,1)
D-5	Ra-228+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(33,2)
D-5				
D-5	Sr-90+D , fish	6.000E+01	6.000E+01	BIOFAC(34,1)
D-5	Sr-90+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(34,2)
D-5				
D-5	Tc-99 , fish	2.000E+01	2.000E+01	BIOFAC(35,1)
D-5	Tc-99 , crustacea and mollusks	5.000E+00	5.000E+00	BIOFAC(35,2)
D-5				
D-5	Th-228+D , fish	1.000E+02	1.000E+02	BIOFAC(36,1)
D-5	Th-228+D , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(36,2)
D-5				
D-5	Th-229+D , fish	1.000E+02	1.000E+02	BIOFAC(37,1)
D-5	Th-229+D , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(37,2)

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

Menu	Parameter	Current Value	Default	Parameter Name
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(38,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(38,2)
D-5				
D-5	Th-232 , fish	1.000E+02	1.000E+02	BIOFAC(39,1)
D-5	Th-232 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(39,2)
D-5				
D-5	U-233 , fish	1.000E+01	1.000E+01	BIOFAC(40,1)
D-5	U-233 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(40,2)
D-5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(41,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(41,2)
D-5				
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIOFAC(42,1)
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(42,2)
D-5				
D-5	U-236 , fish	1.000E+01	1.000E+01	BIOFAC(43,1)
D-5	U-236 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(43,2)
D-5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(44,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(44,2)

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)	3.650E+03	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	3.000E+00	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	7.000E+01	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	2.500E+01	---	BRDL
R011	Time since placement of material (yr)	1.000E+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): Am-241	4.100E-01	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): C-14	1.970E+00	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Cm-245	7.000E-02	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): Co-60	6.560E-01	0.000E+00	---	S1(9)
R012	Initial principal radionuclide (pCi/g): Cs-137	7.804E+01	0.000E+00	---	S1(11)
R012	Initial principal radionuclide (pCi/g): H-3	8.300E-01	0.000E+00	---	S1(18)
R012	Initial principal radionuclide (pCi/g): Ni-63	3.090E+00	0.000E+00	---	S1(23)
R012	Initial principal radionuclide (pCi/g): Pu-238	6.000E-02	0.000E+00	---	S1(27)
R012	Initial principal radionuclide (pCi/g): Pu-239	5.900E-01	0.000E+00	---	S1(28)
R012	Initial principal radionuclide (pCi/g): Pu-241	8.100E-01	0.000E+00	---	S1(29)
R012	Initial principal radionuclide (pCi/g): Sr-90	1.323E+01	0.000E+00	---	S1(34)
R012	Initial principal radionuclide (pCi/g): U-234	1.400E-01	0.000E+00	---	S1(41)
R012	Initial principal radionuclide (pCi/g): U-235	1.000E-02	0.000E+00	---	S1(42)
R012	Initial principal radionuclide (pCi/g): U-238	1.100E-01	0.000E+00	---	S1(44)
R012	Concentration in groundwater (pCi/L): Am-241	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): C-14	not used	0.000E+00	---	W1(4)
R012	Concentration in groundwater (pCi/L): Cm-245	not used	0.000E+00	---	W1(7)
R012	Concentration in groundwater (pCi/L): Co-60	not used	0.000E+00	---	W1(9)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	W1(11)
R012	Concentration in groundwater (pCi/L): H-3	not used	0.000E+00	---	W1(18)
R012	Concentration in groundwater (pCi/L): Ni-63	not used	0.000E+00	---	W1(23)
R012	Concentration in groundwater (pCi/L): Pu-238	not used	0.000E+00	---	W1(27)
R012	Concentration in groundwater (pCi/L): Pu-239	not used	0.000E+00	---	W1(28)
R012	Concentration in groundwater (pCi/L): Pu-241	not used	0.000E+00	---	W1(29)
R012	Concentration in groundwater (pCi/L): Sr-90	not used	0.000E+00	---	W1(34)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(41)
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	---	W1(42)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(44)
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)	1.560E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.100E-01	4.000E-01	---	TPCZ

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	8.600E-01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	1.400E+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)	8.000E+00	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	8.600E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	1.040E+00	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)	1.000E+06	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	1.460E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	4.500E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	2.000E-01	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	2.000E-01	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	1.070E+03	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	4.500E-03	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	0.000E+00	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	2.010E+00	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	MB	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	1.180E+02	2.500E+02	---	UW
R015	Number of unsaturated zone strata	1	1	---	NS
R015	Unsat. zone 1, thickness (m)	0.000E+00	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.560E+00	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	4.100E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	3.000E-01	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	2.000E-01	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	1.400E+00	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	1.262E+03	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Am-241				
R016	Contaminated zone (cm**3/g)	4.450E+02	2.000E+01	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.146E-04	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for C-14				
R016	Contaminated zone (cm**3/g)	2.600E+01	0.000E+00	---	DCNUCC(4)
R016	Unsaturated zone 1 (cm**3/g)	2.100E+01	0.000E+00	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	2.100E+01	0.000E+00	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.030E-03	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Cm-245				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCC(7)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU(7,1)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.340E-04	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for Co-60				
R016	Contaminated zone (cm**3/g)	1.700E+01	1.000E+03	---	DCNUCC(9)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCU(9,1)
R016	Saturated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCS(9)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.069E-02	ALEACH(9)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(9)
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	6.500E+00	1.000E+03	---	DCNUCC(11)
R016	Unsaturated zone 1 (cm**3/g)	4.470E+02	1.000E+03	---	DCNUCU(11,1)
R016	Saturated zone (cm**3/g)	4.470E+02	1.000E+03	---	DCNUCS(11)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.730E-02	ALEACH(11)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(11)
R016	Distribution coefficients for H-3				
R016	Contaminated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCC(18)
R016	Unsaturated zone 1 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU(18,1)
R016	Saturated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCS(18)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.024E-01	ALEACH(18)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(18)
R016	Distribution coefficients for Ni-63				
R016	Contaminated zone (cm**3/g)	3.200E+01	1.000E+03	---	DCNUCC(23)
R016	Unsaturated zone 1 (cm**3/g)	3.700E+01	1.000E+03	---	DCNUCU(23,1)
R016	Saturated zone (cm**3/g)	3.700E+01	1.000E+03	---	DCNUCS(23)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.722E-03	ALEACH(23)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(23)
R016	Distribution coefficients for Pu-238				
R016	Contaminated zone (cm**3/g)	1.625E+03	2.000E+03	---	DCNUCC(27)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCU(27,1)
R016	Saturated zone (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCS(27)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.136E-04	ALEACH(27)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(27)
R016	Distribution coefficients for Pu-239				
R016	Contaminated zone (cm**3/g)	1.625E+03	2.000E+03	---	DCNUCC(28)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCU(28,1)
R016	Saturated zone (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCS(28)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.136E-04	ALEACH(28)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(28)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Pu-241				
R016	Contaminated zone (cm**3/g)	1.625E+03	2.000E+03	---	DCNUCC(29)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCU(29,1)
R016	Saturated zone (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCS(29)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.136E-04	ALEACH(29)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(29)
R016	Distribution coefficients for Sr-90				
R016	Contaminated zone (cm**3/g)	3.500E+00	3.000E+01	---	DCNUCC(34)
R016	Unsaturated zone 1 (cm**3/g)	3.200E+01	3.000E+01	---	DCNUCU(34,1)
R016	Saturated zone (cm**3/g)	3.200E+01	3.000E+01	---	DCNUCS(34)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.906E-02	ALEACH(34)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(34)
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	2.120E+02	5.000E+01	---	DCNUCC(41)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(41,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(41)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.697E-04	ALEACH(41)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(41)
R016	Distribution coefficients for U-235				
R016	Contaminated zone (cm**3/g)	2.120E+02	5.000E+01	---	DCNUCC(42)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(42,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(42)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.697E-04	ALEACH(42)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(42)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	2.120E+02	5.000E+01	---	DCNUCC(44)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(44,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(44)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.697E-04	ALEACH(44)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(44)
R016	Distribution coefficients for daughter Ac-227				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.111E-03	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for daughter Am-243				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.111E-03	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for daughter Cm-243				
R016	Contaminated zone (cm**3/g)	4.000E+02	-1.000E+00	---	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	6.760E+03	-1.000E+00	---	DCNUCU(5,1)
R016	Saturated zone (cm**3/g)	6.760E+03	-1.000E+00	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.612E-04	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R016	Distribution coefficients for daughter Cm-243				
R016	Contaminated zone (cm**3/g)	4.000E+02	-1.000E+00	---	DCNUCC(6)
R016	Unsaturated zone 1 (cm**3/g)	6.760E+03	-1.000E+00	---	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	6.760E+03	-1.000E+00	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.612E-04	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R016	Distribution coefficients for daughter Cs-134				
R016	Contaminated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCC(10)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCU(10,1)
R016	Saturated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCS(10)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.846E-04	ALEACH(10)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(10)
R016	Distribution coefficients for daughter Eu-152				
R016	Contaminated zone (cm**3/g)	4.000E+02	-1.000E+00	---	DCNUCC(12)
R016	Unsaturated zone 1 (cm**3/g)	9.550E+02	-1.000E+00	---	DCNUCU(12,1)
R016	Saturated zone (cm**3/g)	9.550E+02	-1.000E+00	---	DCNUCS(12)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.612E-04	ALEACH(12)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(12)
R016	Distribution coefficients for daughter Eu-152				
R016	Contaminated zone (cm**3/g)	4.000E+02	-1.000E+00	---	DCNUCC(13)
R016	Unsaturated zone 1 (cm**3/g)	9.550E+02	-1.000E+00	---	DCNUCU(13,1)
R016	Saturated zone (cm**3/g)	9.550E+02	-1.000E+00	---	DCNUCS(13)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.612E-04	ALEACH(13)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(13)
R016	Distribution coefficients for daughter Eu-154				
R016	Contaminated zone (cm**3/g)	4.000E+02	-1.000E+00	---	DCNUCC(14)
R016	Unsaturated zone 1 (cm**3/g)	9.550E+02	-1.000E+00	---	DCNUCU(14,1)
R016	Saturated zone (cm**3/g)	9.550E+02	-1.000E+00	---	DCNUCS(14)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.612E-04	ALEACH(14)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(14)
R016	Distribution coefficients for daughter Eu-155				
R016	Contaminated zone (cm**3/g)	4.000E+02	-1.000E+00	---	DCNUCC(15)
R016	Unsaturated zone 1 (cm**3/g)	9.550E+02	-1.000E+00	---	DCNUCU(15,1)
R016	Saturated zone (cm**3/g)	9.550E+02	-1.000E+00	---	DCNUCS(15)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.612E-04	ALEACH(15)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(15)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for daughter Fe-55				
R016	Contaminated zone (cm**3/g)	1.300E+01	1.000E+03	---	DCNUCC(16)
R016	Unsaturated zone 1 (cm**3/g)	8.910E+02	1.000E+03	---	DCNUCU(16,1)
R016	Saturated zone (cm**3/g)	8.910E+02	1.000E+03	---	DCNUCS(16)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.392E-02	ALEACH(16)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(16)
R016	Distribution coefficients for daughter Gd-152				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCC(17)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU(17,1)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCS(17)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.237E-04	ALEACH(17)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(17)
R016	Distribution coefficients for daughter I-129				
R016	Contaminated zone (cm**3/g)	3.200E+00	1.000E-01	---	DCNUCC(19)
R016	Unsaturated zone 1 (cm**3/g)	1.000E-01	1.000E-01	---	DCNUCU(19,1)
R016	Saturated zone (cm**3/g)	1.000E-01	1.000E-01	---	DCNUCS(19)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.331E-02	ALEACH(19)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(19)
R016	Distribution coefficients for daughter Na-22				
R016	Contaminated zone (cm**3/g)	1.000E+01	1.000E+01	---	DCNUCC(20)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+01	1.000E+01	---	DCNUCU(20,1)
R016	Saturated zone (cm**3/g)	1.000E+01	1.000E+01	---	DCNUCS(20)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.799E-02	ALEACH(20)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(20)
R016	Distribution coefficients for daughter Nb-94				
R016	Contaminated zone (cm**3/g)	3.250E+02	0.000E+00	---	DCNUCC(21)
R016	Unsaturated zone 1 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU(21,1)
R016	Saturated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCS(21)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.676E-04	ALEACH(21)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(21)
R016	Distribution coefficients for daughter Ni-59				
R016	Contaminated zone (cm**3/g)	3.200E+01	1.000E+03	---	DCNUCC(22)
R016	Unsaturated zone 1 (cm**3/g)	3.700E+01	1.000E+03	---	DCNUCU(22,1)
R016	Saturated zone (cm**3/g)	3.700E+01	1.000E+03	---	DCNUCS(22)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.722E-03	ALEACH(22)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(22)
R016	Distribution coefficients for daughter Np-237				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCC(24)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCU(24,1)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCS(24)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.164E-04	ALEACH(24)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(24)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for daughter Pa-231				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(25)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(25,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(25)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.673E-03	ALEACH(25)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(25)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC(26)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCU(26,1)
R016	Saturated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCS(26)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.841E-03	ALEACH(26)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(26)
R016	Distribution coefficients for daughter Pu-242				
R016	Contaminated zone (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCC(31)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCU(31,1)
R016	Saturated zone (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCS(31)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.230E-05	ALEACH(31)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(31)
R016	Distribution coefficients for daughter Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(32)
R016	Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU(32,1)
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCS(32)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.627E-03	ALEACH(32)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(32)
R016	Distribution coefficients for daughter Ra-228				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(33)
R016	Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU(33,1)
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCS(33)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.627E-03	ALEACH(33)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(33)
R016	Distribution coefficients for daughter Tc-99				
R016	Contaminated zone (cm**3/g)	5.200E+00	0.000E+00	---	DCNUCC(35)
R016	Unsaturated zone 1 (cm**3/g)	7.000E+00	0.000E+00	---	DCNUCU(35,1)
R016	Saturated zone (cm**3/g)	7.000E+00	0.000E+00	---	DCNUCS(35)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.379E-02	ALEACH(35)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(35)
R016	Distribution coefficients for daughter Th-228				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(36)
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCU(36,1)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(36)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.077E-06	ALEACH(36)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(36)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for daughter Th-229				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(37)
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCU(37,1)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(37)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.077E-06	ALEACH(37)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(37)
R016	Distribution coefficients for daughter Th-230				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(38)
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCU(38,1)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(38)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.077E-06	ALEACH(38)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(38)
R016	Distribution coefficients for daughter Th-232				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(39)
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCU(39,1)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(39)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.077E-06	ALEACH(39)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(39)
R016	Distribution coefficients for daughter U-233				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(40)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(40,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(40)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.673E-03	ALEACH(40)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(40)
R016	Distribution coefficients for daughter U-236				
R016	Contaminated zone (cm**3/g)	2.120E+02	5.000E+01	---	DCNUCC(43)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(43,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(43)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.697E-04	ALEACH(43)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(43)
R017	Inhalation rate (m**3/yr)	8.400E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	6.000E-06	1.000E-04	---	MLINH
R017	Exposure duration	3.653E+02	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	4.700E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	6.600E-01	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	1.100E-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)	7.800E+01	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	1.500E+01	1.400E-01	---	DIET(2)
R018	Milk consumption (L/yr)	1.180E+02	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	8.200E+01	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	1.600E+01	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	0.000E+00	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	1.830E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	4.780E+02	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	1.000E+00	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	1.000E+00	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	1.000E+00	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	5.000E-01	5.000E-01	---	FR9
R018	Contamination fraction of plant food	1.000E+00	-1	---	FPLANT
R018	Contamination fraction of meat	1.000E+00	-1	---	FMEAT
R018	Contamination fraction of milk	1.000E+00	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	8.500E+00	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	1.700E+01	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	5.000E+01	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	1.600E+02	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	5.000E-01	5.000E-01	---	LSI

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)	1.000E-04	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	9.000E-01	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	1.000E+00	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	1.000E+00	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	1.000E+00	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	7.000E-01	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	1.500E+00	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	1.100E+00	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	1.700E-01	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	2.500E-01	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	8.000E-02	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	1.000E-01	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	1.000E+00	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	1.000E+00	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RWET(3)
R19E	Weathering Removal Constant for Vegetation	2.000E+01	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	2.000E-05	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	3.000E-02	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	2.000E-02	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	9.800E-01	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	3.000E-01	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	7.000E-07	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	1.000E-10	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	8.000E-01	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	2.000E-01	2.000E-01	---	AVFG5
C14	DCF correction factor for gaseous forms of C14	8.894E+01	8.894E+01	---	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

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	1	---	---	KYMAX

Summary of Pathway Selections

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

Summary : RESRAD Default Parameters
File : Plumbrook Subsurface Modified HL CORE MIX.RAD

Contaminated Zone Dimensions	
Area:	3850.00 square meters
Thickness:	3.00 meters
Cover Depth:	0.00 meters

Initial Soil Concentrations, pCi/g	
Am-241	4.100E-01
C-14	1.970E+00
Cm-245	7.000E-02
Co-60	6.500E-01
Cs-137	7.804E+01
H-3	8.300E-01
Ni-63	3.090E+00
Pu-238	6.000E-02
Pu-239	5.900E-01
Pu-241	8.100E-01
Sr-90	1.323E+01
U-234	1.400E-01
U-235	1.000E-02
U-238	1.100E-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):	1.404E+03	1.321E+03	1.174E+03	7.805E+02	2.523E+02	9.772E+00	2.998E+00	1.417E+00
M(t):	5.618E+01	5.286E+01	4.696E+01	3.122E+01	1.009E+01	3.909E-01	1.199E-01	5.669E-02

Maximum TDOSE(t): 1.404E+03 mrem/yr at t = 0.000E+00 years

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	BRF(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
U-234	Pu-238	1.000E+00	0.000E+00	1.693E-07	5.035E-07	1.627E-06	4.475E-06	1.114E-05	1.618E-05	9.946E-06
U-234	U-234	1.000E+00	1.400E-01	1.399E-01	1.396E-01	1.388E-01	1.364E-01	1.283E-01	1.078E-01	5.850E-02
U-234	U-238	1.000E+00	0.000E+00	3.116E-07	9.331E-07	3.091E-06	9.114E-06	2.858E-05	7.204E-05	1.305E-04
U-234	ΣS(j):		1.400E-01	1.399E-01	1.396E-01	1.388E-01	1.364E-01	1.283E-01	1.078E-01	5.864E-02
Th-230	Pu-238	1.000E+00	0.000E+00	7.633E-13	6.829E-12	7.433E-11	6.313E-10	5.780E-09	3.221E-08	1.156E-07
Th-230	U-234	1.000E+00	0.000E+00	1.260E-06	3.776E-06	1.255E-05	3.731E-05	1.206E-04	3.320E-04	8.350E-04
Th-230	U-238	1.000E+00	0.000E+00	1.403E-12	1.261E-11	1.395E-10	1.241E-09	1.324E-08	1.062E-07	7.989E-07
Th-230	ΣS(j):		0.000E+00	1.260E-06	3.776E-06	1.255E-05	3.731E-05	1.206E-04	3.322E-04	8.359E-04
Ra-226	Pu-238	1.000E+00	0.000E+00	1.102E-16	2.958E-15	1.073E-13	2.731E-12	8.276E-11	1.319E-09	1.155E-08
Ra-226	U-234	1.000E+00	0.000E+00	2.726E-10	2.447E-09	2.694E-08	2.362E-07	2.398E-06	1.686E-05	8.829E-05
Ra-226	U-238	1.000E+00	0.000E+00	2.024E-16	5.453E-15	2.003E-13	5.279E-12	1.799E-10	3.856E-09	6.821E-08
Ra-226	ΣS(j):		0.000E+00	2.726E-10	2.447E-09	2.694E-08	2.362E-07	2.399E-06	1.687E-05	8.837E-05
Pb-210	Pu-238	1.000E+00	0.000E+00	8.514E-19	6.775E-17	7.863E-15	5.374E-13	3.901E-11	9.912E-10	1.047E-08
Pb-210	U-234	1.000E+00	0.000E+00	2.802E-12	7.430E-11	2.584E-09	5.886E-08	1.318E-06	1.341E-05	8.068E-05
Pb-210	U-238	1.000E+00	0.000E+00	1.563E-18	1.247E-16	1.462E-14	1.029E-12	8.292E-11	2.607E-09	6.053E-08
Pb-210	ΣS(j):		0.000E+00	2.802E-12	7.430E-11	2.584E-09	5.886E-08	1.318E-06	1.342E-05	8.075E-05
[illegible]9	Pu-239	1.000E+00	5.900E-01	5.899E-01	5.897E-01	5.892E-01	5.875E-01	5.817E-01	5.653E-01	5.117E-01
U-235	Pu-239	1.000E+00	0.000E+00	5.808E-10	1.741E-09	5.781E-09	1.717E-08	5.525E-08	1.501E-07	3.581E-07
U-235	U-235	1.000E+00	1.000E-02	9.991E-03	9.974E-03	9.913E-03	9.742E-03	9.167E-03	7.703E-03	4.191E-03
U-235	ΣS(j):		1.000E-02	9.991E-03	9.974E-03	9.913E-03	9.742E-03	9.167E-03	7.704E-03	4.191E-03
Pa-231	Pu-239	1.000E+00	0.000E+00	6.138E-15	5.507E-14	6.052E-13	5.280E-12	5.270E-11	3.545E-10	1.650E-09
Pa-231	U-235	1.000E+00	0.000E+00	2.111E-07	6.304E-07	2.068E-06	5.929E-06	1.690E-05	3.298E-05	2.953E-05
Pa-231	ΣS(j):		0.000E+00	2.111E-07	6.304E-07	2.068E-06	5.929E-06	1.690E-05	3.298E-05	2.953E-05
Ac-227	Pu-239	1.000E+00	0.000E+00	6.449E-17	1.702E-15	5.836E-14	1.282E-12	2.634E-11	2.414E-10	1.254E-09
Ac-227	U-235	1.000E+00	0.000E+00	3.317E-09	2.897E-08	2.906E-07	1.992E-06	1.038E-05	2.471E-05	2.334E-05
Ac-227	ΣS(j):		0.000E+00	3.317E-09	2.897E-08	2.906E-07	1.992E-06	1.038E-05	2.471E-05	2.335E-05
Sr-90	Sr-90	1.000E+00	1.323E+01	1.230E+01	1.063E+01	6.384E+00	1.487E+00	9.058E-03	4.246E-09	2.994E-31
U-238	U-238	1.000E+00	1.100E-01	1.099E-01	1.097E-01	1.090E-01	1.072E-01	1.008E-01	8.474E-02	4.610E-02

BRF(i) is the branch fraction of the parent nuclide.

RESCALC.EXE execution time = 29.95 seconds

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.
Am-241	7.128E-03	0.0000	5.260E-04	0.0000	0.000E+00	0.0000	1.388E-01	0.0001	1.971E-03	0.0000	1.819E-04	0.0000	2.101E-02	0.0000
C-14	4.263E-06	0.0000	3.055E-04	0.0000	0.000E+00	0.0000	1.615E+00	0.0012	7.795E-01	0.0006	4.723E-01	0.0003	2.330E-05	0.0000
Cm-245	9.395E-03	0.0000	9.216E-05	0.0000	0.000E+00	0.0000	2.439E-02	0.0000	1.367E-04	0.0000	3.195E-05	0.0000	3.690E-03	0.0000
Co-60	3.794E+00	0.0027	3.838E-07	0.0000	0.000E+00	0.0000	1.213E-01	0.0001	2.003E-02	0.0000	7.161E-03	0.0000	2.297E-04	0.0000
Cs-137	9.962E+01	0.0709	7.022E-06	0.0000	0.000E+00	0.0000	1.417E+01	0.0101	4.999E+00	0.0036	4.246E+00	0.0030	5.362E-02	0.0000
H-3	0.000E+00	0.0000	2.189E-04	0.0000	0.000E+00	0.0000	8.173E-03	0.0000	4.877E-04	0.0000	9.959E-04	0.0000	3.933E-07	0.0000
Ni-63	0.000E+00	0.0000	5.586E-06	0.0000	0.000E+00	0.0000	8.239E-03	0.0000	4.263E-04	0.0000	5.646E-03	0.0000	2.496E-05	0.0000
Pu-238	3.726E-06	0.0000	6.776E-05	0.0000	0.000E+00	0.0000	1.781E-02	0.0000	5.057E-04	0.0000	1.167E-05	0.0000	2.695E-03	0.0000
Pu-239	6.910E-05	0.0000	7.321E-04	0.0000	0.000E+00	0.0000	1.945E-01	0.0001	5.523E-03	0.0000	1.274E-04	0.0000	2.943E-02	0.0000
Pu-241	1.702E-05	0.0000	1.969E-05	0.0000	0.000E+00	0.0000	5.261E-03	0.0000	1.466E-04	0.0000	3.588E-06	0.0000	7.960E-04	0.0000
Sr-90	1.212E-01	0.0001	4.835E-05	0.0000	0.000E+00	0.0000	5.454E+01	0.0388	2.493E+00	0.0016	2.592E+00	0.0018	2.751E-02	0.0000
U-234	2.247E-05	0.0000	5.343E-05	0.0000	0.000E+00	0.0000	9.213E-03	0.0000	3.650E-04	0.0000	1.521E-03	0.0000	5.580E-04	0.0000
U-235	2.971E-03	0.0000	3.557E-06	0.0000	0.000E+00	0.0000	6.219E-04	0.0000	2.475E-05	0.0000	1.025E-04	0.0000	3.762E-05	0.0000
U-238	6.482E-03	0.0000	3.753E-05	0.0000	0.000E+00	0.0000	6.881E-03	0.0000	2.726E-04	0.0000	1.136E-03	0.0000	4.168E-04	0.0000
Total	1.036E+02	0.0737	2.112E-03	0.0000	0.000E+00	0.0000	7.086E+01	0.0505	8.302E+00	0.0059	7.328E+00	0.0052	1.400E-01	0.0001

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.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	1.600E+00	0.0011	3.092E-03	0.0000	0.000E+00	0.0000	9.010E-01	0.0006	1.133E-03	0.0000	2.530E-04	0.0000	2.675E+00	0.0019
C-14	3.704E-03	0.0000	1.224E-02	0.0000	0.000E+00	0.0000	6.054E-03	0.0000	3.167E-03	0.0000	4.766E-03	0.0000	2.897E+00	0.0021
Cm-245	9.087E-02	0.0001	1.757E-04	0.0000	0.000E+00	0.0000	5.118E-02	0.0000	2.586E-05	0.0000	1.436E-05	0.0000	1.800E-01	0.0001
Co-60	4.513E-01	0.0003	8.726E-03	0.0000	0.000E+00	0.0000	2.586E-01	0.0002	1.282E-01	0.0001	7.151E-02	0.0001	4.861E+00	0.0035
Cs-137	2.692E+02	0.1917	3.471E+01	0.0247	0.000E+00	0.0000	1.530E+02	0.1089	1.148E+02	0.0817	1.707E+02	0.1215	8.655E+02	0.6163
H-3	2.703E-02	0.0000	1.773E-06	0.0000	0.000E+00	0.0000	1.309E-02	0.0000	1.992E-03	0.0000	6.144E-03	0.0000	5.814E-02	0.0000
Ni-63	2.624E-02	0.0000	1.691E-04	0.0000	0.000E+00	0.0000	1.494E-02	0.0000	1.861E-03	0.0000	4.155E-02	0.0000	9.909E-02	0.0001
Pu-238	5.622E-02	0.0000	1.087E-04	0.0000	0.000E+00	0.0000	3.166E-02	0.0000	7.961E-05	0.0000	4.453E-06	0.0000	1.092E-01	0.0001
Pu-239	6.139E-01	0.0004	1.187E-03	0.0000	0.000E+00	0.0000	3.458E-01	0.0002	8.695E-04	0.0000	4.855E-05	0.0000	1.192E+00	0.0008
Pu-241	2.342E-02	0.0000	4.517E-05	0.0000	0.000E+00	0.0000	1.315E-02	0.0000	2.762E-05	0.0000	2.413E-06	0.0000	4.289E-02	0.0000
Sr-90	2.485E+02	0.1770	9.614E-01	0.0007	0.000E+00	0.0000	1.492E+02	0.1063	2.846E+01	0.0203	3.959E+01	0.0282	5.265E+02	0.3749
U-234	8.914E-02	0.0001	5.744E-05	0.0000	0.000E+00	0.0000	5.022E-02	0.0000	4.293E-04	0.0000	4.230E-03	0.0000	1.558E-01	0.0001
U-235	6.041E-03	0.0000	3.893E-06	0.0000	0.000E+00	0.0000	3.403E-03	0.0000	3.099E-05	0.0000	2.851E-04	0.0000	1.353E-02	0.0000
U-238	6.658E-02	0.0000	4.290E-05	0.0000	0.000E+00	0.0000	3.751E-02	0.0000	3.206E-04	0.0000	3.159E-03	0.0000	1.228E-01	0.0001
Total	5.208E+02	0.3708	3.569E+01	0.0254	0.000E+00	0.0000	3.039E+02	0.2164	1.434E+02	0.1021	2.104E+02	0.1498	1.404E+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.
Am-241	7.114E-03	0.0000	5.250E-04	0.0000	0.000E+00	0.0000	1.386E-01	0.0001	1.967E-03	0.0000	1.816E-04	0.0000	2.097E-02	0.0000
C-14	4.628E-07	0.0000	3.317E-05	0.0000	0.000E+00	0.0000	1.798E-01	0.0001	9.418E-02	0.0001	5.547E-02	0.0000	2.530E-06	0.0000
Cm-245	9.393E-03	0.0000	9.222E-05	0.0000	0.000E+00	0.0000	2.441E-02	0.0000	1.393E-04	0.0000	3.196E-05	0.0000	3.693E-03	0.0000
Co-60	3.291E+00	0.0025	3.329E-07	0.0000	0.000E+00	0.0000	1.052E-01	0.0001	1.737E-02	0.0000	6.213E-03	0.0000	1.992E-04	0.0000
Cs-137	9.472E+01	0.0717	6.677E-06	0.0000	0.000E+00	0.0000	1.347E+01	0.0102	4.755E+00	0.0036	4.039E+00	0.0031	5.098E-02	0.0000
H-3	0.000E+00	0.0000	5.069E-05	0.0000	0.000E+00	0.0000	1.915E-03	0.0000	1.195E-04	0.0000	2.404E-04	0.0000	9.109E-08	0.0000
Ni-63	0.000E+00	0.0000	5.514E-08	0.0000	0.000E+00	0.0000	8.133E-03	0.0000	4.208E-04	0.0000	5.574E-03	0.0000	2.464E-05	0.0000
Pu-238	3.696E-06	0.0000	6.722E-05	0.0000	0.000E+00	0.0000	1.767E-02	0.0000	5.017E-04	0.0000	1.158E-05	0.0000	2.673E-03	0.0000
Pu-239	6.909E-05	0.0000	7.320E-04	0.0000	0.000E+00	0.0000	1.945E-01	0.0001	5.522E-03	0.0000	1.274E-04	0.0000	2.942E-02	0.0000
Pu-241	3.824E-05	0.0000	2.039E-05	0.0000	0.000E+00	0.0000	5.442E-03	0.0000	1.458E-04	0.0000	3.981E-06	0.0000	8.235E-04	0.0000
Sr-90	1.127E-01	0.0001	4.495E-05	0.0000	0.000E+00	0.0000	5.072E+01	0.0384	2.321E+00	0.0018	2.412E+00	0.0018	2.558E-02	0.0000
U-234	2.246E-05	0.0000	5.338E-05	0.0000	0.000E+00	0.0000	9.205E-03	0.0000	3.647E-04	0.0000	1.520E-03	0.0000	5.576E-04	0.0000
U-235	2.969E-03	0.0000	3.554E-06	0.0000	0.000E+00	0.0000	6.234E-04	0.0000	2.507E-05	0.0000	1.024E-04	0.0000	3.762E-05	0.0000
U-238	6.477E-03	0.0000	3.750E-05	0.0000	0.000E+00	0.0000	6.675E-03	0.0000	2.724E-04	0.0000	1.135E-03	0.0000	4.164E-04	0.0000
Total	9.815E+01	0.0743	1.667E-03	0.0000	0.000E+00	0.0000	6.488E+01	0.0491	7.197E+00	0.0054	6.522E+00	0.0049	1.354E-01	0.0001

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.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	1.596E+00	0.0012	3.085E-03	0.0000	0.000E+00	0.0000	8.989E-01	0.0007	1.130E-03	0.0000	2.524E-04	0.0000	2.669E+00	0.0020
C-14	4.025E-04	0.0000	1.346E-03	0.0000	0.000E+00	0.0000	6.742E-04	0.0000	3.678E-04	0.0000	5.261E-04	0.0000	3.328E-01	0.0003
Cm-245	9.092E-02	0.0001	1.758E-04	0.0000	0.000E+00	0.0000	5.121E-02	0.0000	2.596E-05	0.0000	1.437E-05	0.0000	1.801E-01	0.0001
Co-60	3.914E-01	0.0003	7.567E-03	0.0000	0.000E+00	0.0000	2.243E-01	0.0002	1.112E-01	0.0001	6.202E-02	0.0000	4.217E+00	0.0032
Cs-137	2.559E+02	0.1937	3.299E+01	0.0250	0.000E+00	0.0000	1.454E+02	0.1101	1.092E+02	0.0826	1.623E+02	0.1228	8.228E+02	0.6227
H-3	6.265E-03	0.0000	4.132E-07	0.0000	0.000E+00	0.0000	3.066E-03	0.0000	4.736E-04	0.0000	1.432E-03	0.0000	1.356E-02	0.0000
Ni-63	2.589E-02	0.0000	1.669E-04	0.0000	0.000E+00	0.0000	1.474E-02	0.0000	1.837E-03	0.0000	4.100E-02	0.0000	9.779E-02	0.0001
Pu-238	5.575E-02	0.0000	1.078E-04	0.0000	0.000E+00	0.0000	3.140E-02	0.0000	7.895E-05	0.0000	4.421E-06	0.0000	1.083E-01	0.0001
Pu-239	6.136E-01	0.0005	1.186E-03	0.0000	0.000E+00	0.0000	3.456E-01	0.0003	8.690E-04	0.0000	4.853E-05	0.0000	1.192E+00	0.0009
Pu-241	2.748E-02	0.0000	5.301E-05	0.0000	0.000E+00	0.0000	1.544E-02	0.0000	2.993E-05	0.0000	3.112E-06	0.0000	4.948E-02	0.0000
Sr-90	2.310E+02	0.1748	8.937E-01	0.0007	0.000E+00	0.0000	1.387E+02	0.1050	2.648E+01	0.0200	3.681E+01	0.0279	4.895E+02	0.3704
U-234	8.904E-02	0.0001	5.737E-05	0.0000	0.000E+00	0.0000	5.016E-02	0.0000	4.288E-04	0.0000	4.225E-03	0.0000	1.556E-01	0.0001
U-235	6.059E-03	0.0000	3.906E-06	0.0000	0.000E+00	0.0000	3.414E-03	0.0000	3.243E-05	0.0000	2.848E-04	0.0000	1.355E-02	0.0000
U-238	6.650E-02	0.0001	4.285E-05	0.0000	0.000E+00	0.0000	3.746E-02	0.0000	3.202E-04	0.0000	3.156E-03	0.0000	1.227E-01	0.0001
Total	4.898E+02	0.3707	3.390E+01	0.0257	0.000E+00	0.0000	2.858E+02	0.2163	1.356E+02	0.1028	1.992E+02	0.1507	1.321E+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.
Am-241	7.086E-03	0.0000	5.228E-04	0.0000	0.000E+00	0.0000	1.380E-01	0.0001	1.959E-03	0.0000	1.808E-04	0.0000	2.088E-02	0.0000
C-14	5.434E-09	0.0000	3.895E-07	0.0000	0.000E+00	0.0000	2.111E-03	0.0000	1.106E-03	0.0000	6.515E-04	0.0000	2.970E-08	0.0000
Cm-245	9.389E-03	0.0000	9.235E-05	0.0000	0.000E+00	0.0000	2.444E-02	0.0000	1.404E-04	0.0000	3.198E-05	0.0000	3.698E-03	0.0000
Co-60	2.477E+00	0.0021	2.505E-07	0.0000	0.000E+00	0.0000	7.918E-02	0.0001	1.307E-02	0.0000	4.675E-03	0.0000	1.499E-04	0.0000
Cs-137	8.564E+01	0.0729	6.037E-06	0.0000	0.000E+00	0.0000	1.218E+01	0.0104	4.299E+00	0.0037	3.652E+00	0.0031	4.610E-02	0.0000
H-3	0.000E+00	0.0000	2.716E-06	0.0000	0.000E+00	0.0000	1.026E-04	0.0000	6.406E-06	0.0000	1.288E-05	0.0000	4.881E-09	0.0000
Ni-63	0.000E+00	0.0000	5.373E-08	0.0000	0.000E+00	0.0000	7.925E-03	0.0000	4.101E-04	0.0000	5.432E-03	0.0000	2.401E-05	0.0000
Pu-238	3.637E-06	0.0000	6.615E-05	0.0000	0.000E+00	0.0000	1.739E-02	0.0000	4.937E-04	0.0000	1.140E-05	0.0000	2.631E-03	0.0000
Pu-239	6.907E-05	0.0000	7.317E-04	0.0000	0.000E+00	0.0000	1.944E-01	0.0002	5.520E-03	0.0000	1.274E-04	0.0000	2.942E-02	0.0000
Pu-241	7.761E-05	0.0000	2.168E-05	0.0000	0.000E+00	0.0000	5.777E-03	0.0000	1.443E-04	0.0000	4.709E-06	0.0000	8.741E-04	0.0000
Sr-90	9.743E-02	0.0001	3.885E-05	0.0000	0.000E+00	0.0000	4.384E+01	0.0373	2.006E+00	0.0017	2.085E+00	0.0018	2.211E-02	0.0000
U-234	2.243E-05	0.0000	5.329E-05	0.0000	0.000E+00	0.0000	9.189E-03	0.0000	3.641E-04	0.0000	1.517E-03	0.0000	5.566E-04	0.0000
U-235	2.964E-03	0.0000	3.550E-06	0.0000	0.000E+00	0.0000	6.266E-04	0.0000	2.570E-05	0.0000	1.023E-04	0.0000	3.763E-05	0.0000
U-238	6.465E-03	0.0000	3.743E-05	0.0000	0.000E+00	0.0000	6.863E-03	0.0000	2.719E-04	0.0000	1.133E-03	0.0000	4.157E-04	0.0000
Total	8.824E+01	0.0752	1.577E-03	0.0000	0.000E+00	0.0000	5.651E+01	0.0481	6.329E+00	0.0054	5.751E+00	0.0049	1.269E-01	0.0001

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.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	1.569E+00	0.0014	3.071E-03	0.0000	0.000E+00	0.0000	8.947E-01	0.0008	1.125E-03	0.0000	2.513E-04	0.0000	2.656E+00	0.0023
C-14	4.718E-06	0.0000	1.578E-05	0.0000	0.000E+00	0.0000	7.903E-06	0.0000	4.312E-06	0.0000	6.167E-06	0.0000	3.909E-03	0.0000
Cm-245	9.107E-02	0.0001	1.760E-04	0.0000	0.000E+00	0.0000	5.129E-02	0.0000	2.618E-05	0.0000	1.438E-05	0.0000	1.804E-01	0.0002
Co-60	2.943E-01	0.0003	5.690E-03	0.0000	0.000E+00	0.0000	1.687E-01	0.0001	8.360E-02	0.0001	4.664E-02	0.0000	3.173E+00	0.0027
Cs-137	2.312E+02	0.1969	2.981E+01	0.0254	0.000E+00	0.0000	1.314E+02	0.1119	9.865E+01	0.0840	1.466E+02	0.1249	7.435E+02	0.6333
H-3	3.353E-04	0.0000	2.212E-08	0.0000	0.000E+00	0.0000	1.641E-04	0.0000	2.535E-05	0.0000	7.666E-05	0.0000	7.261E-04	0.0000
Ni-63	2.522E-02	0.0000	1.625E-04	0.0000	0.000E+00	0.0000	1.436E-02	0.0000	1.788E-03	0.0000	3.993E-02	0.0000	9.524E-02	0.0001
Pu-238	5.483E-02	0.0000	1.060E-04	0.0000	0.000E+00	0.0000	3.088E-02	0.0000	7.765E-05	0.0000	4.358E-06	0.0000	1.065E-01	0.0001
Pu-239	6.131E-01	0.0005	1.185E-03	0.0000	0.000E+00	0.0000	3.453E-01	0.0003	8.682E-04	0.0000	4.848E-05	0.0000	1.191E+00	0.0010
Pu-241	3.501E-02	0.0000	6.757E-05	0.0000	0.000E+00	0.0000	1.968E-02	0.0000	3.429E-05	0.0000	4.416E-06	0.0000	6.169E-02	0.0001
Sr-90	1.995E+02	0.1699	7.720E-01	0.0007	0.000E+00	0.0000	1.198E+02	0.1021	2.287E+01	0.0195	3.180E+01	0.0271	4.228E+02	0.3601
U-234	8.882E-02	0.0001	5.723E-05	0.0000	0.000E+00	0.0000	5.004E-02	0.0000	4.277E-04	0.0000	4.215E-03	0.0000	1.553E-01	0.0001
U-235	6.102E-03	0.0000	3.939E-06	0.0000	0.000E+00	0.0000	3.438E-03	0.0000	3.535E-05	0.0000	2.841E-04	0.0000	1.362E-02	0.0000
U-238	6.634E-02	0.0001	4.275E-05	0.0000	0.000E+00	0.0000	3.737E-02	0.0000	3.195E-04	0.0000	3.148E-03	0.0000	1.224E-01	0.0001
Total	4.336E+02	0.3693	3.059E+01	0.0261	0.000E+00	0.0000	2.528E+02	0.2153	1.216E+02	0.1036	1.785E+02	0.1520	1.174E+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-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	6.987E-03	0.0000	5.155E-04	0.0000	0.000E+00	0.0000	1.361E-01	0.0002	1.932E-03	0.0000	1.783E-04	0.0000	2.059E-02	0.0000
C-14	9.079E-16	0.0000	6.507E-14	0.0000	0.000E+00	0.0000	3.529E-10	0.0000	1.852E-10	0.0000	1.090E-10	0.0000	4.962E-15	0.0000
Cm-245	9.379E-03	0.0000	9.290E-05	0.0000	0.000E+00	0.0000	2.459E-02	0.0000	1.444E-04	0.0000	3.210E-05	0.0000	3.720E-03	0.0000
Co-60	9.153E-01	0.0012	9.259E-08	0.0000	0.000E+00	0.0000	2.926E-02	0.0000	4.832E-03	0.0000	1.728E-03	0.0000	5.540E-05	0.0000
Cs-137	6.018E+01	0.0771	4.242E-06	0.0000	0.000E+00	0.0000	8.559E+00	0.0110	3.021E+00	0.0039	2.566E+00	0.0033	3.239E-02	0.0000
H-3	0.000E+00	0.0000	9.526E-11	0.0000	0.000E+00	0.0000	3.598E-09	0.0000	2.248E-10	0.0000	4.520E-10	0.0000	1.712E-13	0.0000
Ni-63	0.000E+00	0.0000	4.908E-08	0.0000	0.000E+00	0.0000	7.239E-03	0.0000	3.746E-04	0.0000	4.961E-03	0.0000	2.193E-05	0.0000
Pu-238	3.439E-06	0.0000	6.254E-05	0.0000	0.000E+00	0.0000	1.644E-02	0.0000	4.668E-04	0.0000	1.079E-05	0.0000	2.487E-03	0.0000
Pu-239	6.901E-05	0.0000	7.310E-04	0.0000	0.000E+00	0.0000	1.942E-01	0.0002	5.515E-03	0.0000	1.272E-04	0.0000	2.939E-02	0.0000
Pu-241	1.877E-04	0.0000	2.523E-05	0.0000	0.000E+00	0.0000	6.699E-03	0.0000	1.395E-04	0.0000	6.738E-06	0.0000	1.014E-03	0.0000
Sr-90	5.850E-02	0.0001	2.333E-05	0.0000	0.000E+00	0.0000	2.633E+01	0.0337	1.205E+00	0.0015	1.252E+00	0.0016	1.327E-02	0.0000
U-234	2.241E-05	0.0000	5.298E-05	0.0000	0.000E+00	0.0000	9.134E-03	0.0000	3.619E-04	0.0000	1.508E-03	0.0000	5.533E-04	0.0000
U-235	2.946E-03	0.0000	3.540E-06	0.0000	0.000E+00	0.0000	6.379E-04	0.0000	2.787E-05	0.0000	1.017E-04	0.0000	3.767E-05	0.0000
U-238	6.426E-03	0.0000	3.720E-05	0.0000	0.000E+00	0.0000	6.821E-03	0.0000	2.703E-04	0.0000	1.126E-03	0.0000	4.132E-04	0.0000
Total	6.118E+01	0.0784	1.549E-03	0.0000	0.000E+00	0.0000	3.532E+01	0.0452	4.240E+00	0.0054	3.828E+00	0.0049	1.039E-01	0.0001

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-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	1.563E+00	0.0020	3.021E-03	0.0000	0.000E+00	0.0000	8.801E-01	0.0011	1.107E-03	0.0000	2.472E-04	0.0000	2.613E+00	0.0033
C-14	7.838E-13	0.0000	2.621E-12	0.0000	0.000E+00	0.0000	1.313E-12	0.0000	7.168E-13	0.0000	1.025E-12	0.0000	6.536E-10	0.0000
Cm-245	9.200E-02	0.0001	1.778E-04	0.0000	0.000E+00	0.0000	5.181E-02	0.0001	2.721E-05	0.0000	1.450E-05	0.0000	1.820E-01	0.0002
Co-60	1.065E-01	0.0001	2.098E-03	0.0000	0.000E+00	0.0000	6.219E-02	0.0001	3.082E-02	0.0000	1.720E-02	0.0000	1.172E+00	0.0015
Cs-137	1.621E+02	0.2077	2.090E+01	0.0268	0.000E+00	0.0000	9.212E+01	0.1180	6.916E+01	0.0886	1.028E+02	0.1317	5.214E+02	0.6680
H-3	1.172E-08	0.0000	7.731E-13	0.0000	0.000E+00	0.0000	5.737E-09	0.0000	8.861E-10	0.0000	2.679E-09	0.0000	2.539E-08	0.0000
Ni-63	2.298E-02	0.0000	1.481E-04	0.0000	0.000E+00	0.0000	1.306E-02	0.0000	1.630E-03	0.0000	3.638E-02	0.0000	8.682E-02	0.0001
Pu-238	5.172E-02	0.0001	9.997E-05	0.0000	0.000E+00	0.0000	2.913E-02	0.0000	7.324E-05	0.0000	4.146E-06	0.0000	1.005E-01	0.0001
Pu-239	6.110E-01	0.0008	1.181E-03	0.0000	0.000E+00	0.0000	3.441E-01	0.0004	8.653E-04	0.0000	4.832E-05	0.0000	1.187E+00	0.0015
Pu-241	5.592E-02	0.0001	1.080E-04	0.0000	0.000E+00	0.0000	3.147E-02	0.0000	4.637E-05	0.0000	8.048E-06	0.0000	9.563E-02	0.0001
Sr-90	1.195E+02	0.1531	4.625E-01	0.0006	0.000E+00	0.0000	7.178E+01	0.0920	1.370E+01	0.0176	1.905E+01	0.0244	2.534E+02	0.3246
U-234	8.808E-02	0.0001	5.676E-05	0.0000	0.000E+00	0.0000	4.962E-02	0.0001	4.242E-04	0.0000	4.180E-03	0.0000	1.540E-01	0.0002
U-235	6.303E-03	0.0000	4.103E-06	0.0000	0.000E+00	0.0000	3.551E-03	0.0000	4.532E-05	0.0000	2.620E-04	0.0000	1.394E-02	0.0000
U-238	6.578E-02	0.0001	4.239E-05	0.0000	0.000E+00	0.0000	3.706E-02	0.0000	3.168E-04	0.0000	3.122E-03	0.0000	1.214E-01	0.0002
Total	2.843E+02	0.3642	2.137E+01	0.0274	0.000E+00	0.0000	1.654E+02	0.2119	8.290E+01	0.1062	1.219E+02	0.1562	7.805E+02	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.
Am-241	6.711E-03	0.0000	4.951E-04	0.0000	0.000E+00	0.0000	1.307E-01	0.0005	1.856E-03	0.0000	1.713E-04	0.0000	1.977E-02	0.0001
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.022E-29	0.0000	5.385E-30	0.0000	3.164E-30	0.0000	0.000E+00	0.0000
Cm-245	9.362E-03	0.0000	9.484E-05	0.0000	0.000E+00	0.0000	2.510E-02	0.0001	1.549E-04	0.0000	3.267E-05	0.0000	3.798E-03	0.0000
Co-60	5.327E-02	0.0002	5.388E-09	0.0000	0.000E+00	0.0000	1.703E-03	0.0000	2.812E-04	0.0000	1.005E-04	0.0000	3.224E-06	0.0000
Cs-137	2.196E+01	0.0870	1.548E-06	0.0000	0.000E+00	0.0000	3.123E+00	0.0124	1.102E+00	0.0044	9.364E-01	0.0037	1.182E-02	0.0000
H-3	0.000E+00	0.0000	1.564E-23	0.0000	0.000E+00	0.0000	5.911E-22	0.0000	3.697E-23	0.0000	7.430E-23	0.0000	2.811E-26	0.0000
Ni-63	0.000E+00	0.0000	3.788E-08	0.0000	0.000E+00	0.0000	5.588E-03	0.0000	2.891E-04	0.0000	3.830E-03	0.0000	1.693E-05	0.0000
Pu-238	2.930E-06	0.0000	5.328E-05	0.0000	0.000E+00	0.0000	1.400E-02	0.0001	3.976E-04	0.0000	9.224E-06	0.0000	2.119E-03	0.0000
Pu-239	6.861E-05	0.0000	7.289E-04	0.0000	0.000E+00	0.0000	1.937E-01	0.0008	5.499E-03	0.0000	1.269E-04	0.0000	2.930E-02	0.0001
Pu-241	3.490E-04	0.0000	3.008E-05	0.0000	0.000E+00	0.0000	7.957E-03	0.0000	1.299E-04	0.0000	9.648E-06	0.0000	1.204E-03	0.0000
Sr-90	1.362E-02	0.0001	5.433E-06	0.0000	0.000E+00	0.0000	6.130E+00	0.0243	2.805E-01	0.0011	2.916E-01	0.0012	3.091E-03	0.0000
U-234	2.297E-05	0.0000	5.208E-05	0.0000	0.000E+00	0.0000	8.978E-03	0.0000	3.557E-04	0.0000	1.482E-03	0.0000	5.439E-04	0.0000
U-235	2.897E-03	0.0000	3.527E-06	0.0000	0.000E+00	0.0000	6.713E-04	0.0000	3.369E-05	0.0000	9.995E-05	0.0000	3.796E-05	0.0000
U-238	6.315E-03	0.0000	3.656E-05	0.0000	0.000E+00	0.0000	6.704E-03	0.0000	2.656E-04	0.0000	1.107E-03	0.0000	4.061E-04	0.0000
Total	2.205E+01	0.0874	1.501E-03	0.0000	0.000E+00	0.0000	9.649E+00	0.0382	1.392E+00	0.0055	1.235E+00	0.0049	7.212E-02	0.0003

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.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	1.491E+00	0.0059	2.882E-03	0.0000	0.000E+00	0.0000	8.396E-01	0.0033	1.056E-03	0.0000	2.358E-04	0.0000	2.494E+00	0.0099
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.877E-29	0.0000
Cm-245	9.679E-02	0.0004	1.871E-04	0.0000	0.000E+00	0.0000	5.451E-02	0.0002	3.136E-05	0.0000	1.522E-05	0.0000	1.901E-01	0.0008
Co-60	6.273E-03	0.0000	1.213E-04	0.0000	0.000E+00	0.0000	3.595E-03	0.0000	1.782E-03	0.0000	9.941E-04	0.0000	6.812E-02	0.0003
Cs-137	5.875E+01	0.2328	7.575E+00	0.0300	0.000E+00	0.0000	3.339E+01	0.1323	2.507E+01	0.0993	3.726E+01	0.1477	1.892E+02	0.7497
H-3	1.906E-21	0.0000	1.257E-25	0.0000	0.000E+00	0.0000	9.330E-22	0.0000	1.441E-22	0.0000	4.357E-22	0.0000	4.137E-21	0.0000
Ni-63	1.762E-02	0.0001	1.135E-04	0.0000	0.000E+00	0.0000	1.003E-02	0.0000	1.250E-03	0.0000	2.790E-02	0.0001	6.663E-02	0.0003
Pu-238	4.376E-02	0.0002	8.459E-05	0.0000	0.000E+00	0.0000	2.465E-02	0.0001	6.199E-05	0.0000	3.601E-06	0.0000	8.515E-02	0.0003
Pu-239	6.052E-01	0.0024	1.170E-03	0.0000	0.000E+00	0.0000	3.408E-01	0.0014	8.571E-04	0.0000	4.786E-05	0.0000	1.178E+00	0.0047
Pu-241	8.572E-02	0.0003	1.657E-04	0.0000	0.000E+00	0.0000	4.827E-02	0.0002	6.327E-05	0.0000	1.326E-05	0.0000	1.439E-01	0.0006
Sr-90	2.765E+01	0.1096	1.070E-01	0.0004	0.000E+00	0.0000	1.660E+01	0.0658	3.169E+00	0.0126	4.406E+00	0.0175	5.865E+01	0.2324
U-234	8.598E-02	0.0003	5.545E-05	0.0000	0.000E+00	0.0000	4.844E-02	0.0002	4.141E-04	0.0000	4.080E-03	0.0000	1.504E-01	0.0006
U-235	7.156E-03	0.0000	4.850E-06	0.0000	0.000E+00	0.0000	4.032E-03	0.0000	7.190E-05	0.0000	2.764E-04	0.0000	1.528E-02	0.0001
U-238	6.422E-02	0.0003	4.138E-05	0.0000	0.000E+00	0.0000	3.618E-02	0.0001	3.093E-04	0.0000	3.047E-03	0.0000	1.186E-01	0.0005
Total	8.890E+01	0.3523	7.687E+00	0.0305	0.000E+00	0.0000	5.140E+01	0.2037	2.824E+01	0.1119	4.170E+01	0.1653	2.523E+02	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-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	5.830E-03	0.0006	4.299E-04	0.0000	0.000E+00	0.0000	1.136E-01	0.0116	1.613E-03	0.0002	1.487E-04	0.0000	1.717E-02	0.0018
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cm-245	9.337E-03	0.0010	1.022E-04	0.0000	0.000E+00	0.0000	2.706E-02	0.0028	1.871E-04	0.0000	3.517E-05	0.0000	4.094E-03	0.0004
Co-60	2.533E-06	0.0000	2.562E-13	0.0000	0.000E+00	0.0000	8.098E-08	0.0000	1.337E-08	0.0000	4.781E-09	0.0000	1.533E-10	0.0000
Cs-137	6.447E-01	0.0660	4.544E-08	0.0000	0.000E+00	0.0000	9.169E-02	0.0094	3.236E-02	0.0033	2.749E-02	0.0028	3.470E-04	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ni-63	0.000E+00	0.0000	1.531E-08	0.0000	0.000E+00	0.0000	2.258E-03	0.0002	1.169E-04	0.0000	1.548E-03	0.0002	6.842E-06	0.0000
Pu-238	1.674E-06	0.0000	3.041E-05	0.0000	0.000E+00	0.0000	7.992E-03	0.0008	2.269E-04	0.0000	5.357E-06	0.0000	1.209E-03	0.0001
Pu-239	6.814E-05	0.0000	7.217E-04	0.0001	0.000E+00	0.0000	1.917E-01	0.0196	5.445E-03	0.0006	1.256E-04	0.0000	2.901E-02	0.0030
Pu-241	3.957E-04	0.0000	2.933E-05	0.0000	0.000E+00	0.0000	7.747E-03	0.0008	1.106E-04	0.0000	1.012E-05	0.0000	1.171E-03	0.0001
Sr-90	8.300E-05	0.0000	3.310E-08	0.0000	0.000E+00	0.0000	3.735E-02	0.0038	1.709E-03	0.0002	1.776E-03	0.0002	1.883E-05	0.0000
U-234	3.116E-05	0.0000	4.908E-05	0.0000	0.000E+00	0.0000	8.470E-03	0.0009	3.351E-04	0.0000	1.395E-03	0.0001	5.125E-04	0.0001
U-235	2.733E-03	0.0003	3.526E-06	0.0000	0.000E+00	0.0000	7.725E-04	0.0001	5.004E-05	0.0000	9.425E-05	0.0000	3.918E-05	0.0000
U-238	5.942E-03	0.0006	3.441E-05	0.0000	0.000E+00	0.0000	6.309E-03	0.0006	2.500E-04	0.0000	1.042E-03	0.0001	3.822E-04	0.0000
Total	6.691E-01	0.0685	1.401E-03	0.0001	0.000E+00	0.0000	4.949E-01	0.0506	4.241E-02	0.0043	3.367E-02	0.0034	5.396E-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 = 1.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	1.264E+00	0.1293	2.443E-03	0.0003	0.000E+00	0.0000	7.118E-01	0.0728	8.962E-04	0.0001	1.999E-04	0.0000	2.118E+00	0.2167
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cm-245	1.183E-01	0.0121	2.287E-04	0.0000	0.000E+00	0.0000	6.662E-02	0.0068	4.822E-05	0.0000	1.860E-05	0.0000	2.260E-01	0.0231
Co-60	2.912E-07	0.0000	5.631E-09	0.0000	0.000E+00	0.0000	1.669E-07	0.0000	8.273E-08	0.0000	4.615E-08	0.0000	3.225E-06	0.0000
Cs-137	1.684E+00	0.1723	2.171E-01	0.0222	0.000E+00	0.0000	9.571E-01	0.0979	7.186E-01	0.0735	1.068E+00	0.1093	5.441E+00	0.5568
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ni-63	6.953E-03	0.0007	4.480E-05	0.0000	0.000E+00	0.0000	3.958E-03	0.0004	4.931E-04	0.0001	1.101E-02	0.0011	2.639E-02	0.0027
Pu-238	2.439E-02	0.0025	4.714E-05	0.0000	0.000E+00	0.0000	1.374E-02	0.0014	3.457E-05	0.0000	2.259E-06	0.0000	4.768E-02	0.0049
Pu-239	5.851E-01	0.0599	1.131E-03	0.0001	0.000E+00	0.0000	3.295E-01	0.0337	8.286E-04	0.0001	4.627E-05	0.0000	1.144E+00	0.1170
Pu-241	9.000E-02	0.0092	1.740E-04	0.0000	0.000E+00	0.0000	5.069E-02	0.0052	6.389E-05	0.0000	1.423E-05	0.0000	1.504E-01	0.0154
Sr-90	1.645E-01	0.0168	6.364E-04	0.0001	0.000E+00	0.0000	9.877E-02	0.0101	1.885E-02	0.0019	2.621E-02	0.0027	3.499E-01	0.0358
U-234	7.904E-02	0.0081	5.184E-05	0.0000	0.000E+00	0.0000	4.453E-02	0.0046	3.611E-04	0.0000	3.750E-03	0.0004	1.385E-01	0.0142
U-235	1.055E-02	0.0011	7.940E-06	0.0000	0.000E+00	0.0000	5.942E-03	0.0006	1.448E-04	0.0000	2.589E-04	0.0000	2.059E-02	0.0021
U-238	5.901E-02	0.0060	3.803E-05	0.0000	0.000E+00	0.0000	3.325E-02	0.0034	2.842E-04	0.0000	2.800E-03	0.0003	1.093E-01	0.0112
Total	4.086E+00	0.4181	2.219E-01	0.0227	0.000E+00	0.0000	2.316E+00	0.2370	7.406E-01	0.0758	1.112E+00	0.1138	9.772E+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-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	3.902E-03	0.0013	2.871E-04	0.0001	0.000E+00	0.0000	7.600E-02	0.0253	1.080E-03	0.0004	9.936E-05	0.0000	1.147E-02	0.0038
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cm-245	9.210E-03	0.0031	1.176E-04	0.0000	0.000E+00	0.0000	3.112E-02	0.0104	2.532E-04	0.0001	4.050E-05	0.0000	4.708E-03	0.0016
Co-60	1.129E-18	0.0000	1.142E-25	0.0000	0.000E+00	0.0000	3.609E-20	0.0000	5.958E-21	0.0000	2.131E-21	0.0000	6.832E-23	0.0000
Cs-137	2.700E-05	0.0000	1.903E-12	0.0000	0.000E+00	0.0000	3.840E-06	0.0000	1.355E-06	0.0000	1.151E-06	0.0000	1.453E-08	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ni-63	0.000E+00	0.0000	1.150E-09	0.0000	0.000E+00	0.0000	1.697E-04	0.0001	8.780E-06	0.0000	1.163E-04	0.0000	5.141E-07	0.0000
Pu-238	3.450E-07	0.0000	6.128E-06	0.0000	0.000E+00	0.0000	1.610E-03	0.0005	4.573E-05	0.0000	1.231E-06	0.0000	2.435E-04	0.0001
Pu-239	6.626E-05	0.0000	7.014E-04	0.0002	0.000E+00	0.0000	1.864E-01	0.0622	5.292E-03	0.0018	1.221E-04	0.0000	2.820E-02	0.0094
Pu-241	2.674E-04	0.0001	1.968E-05	0.0000	0.000E+00	0.0000	5.207E-03	0.0017	7.400E-05	0.0000	6.809E-06	0.0000	7.859E-04	0.0003
Sr-90	3.891E-11	0.0000	1.552E-14	0.0000	0.000E+00	0.0000	1.751E-08	0.0000	8.011E-10	0.0000	8.327E-10	0.0000	8.828E-12	0.0000
U-234	9.081E-05	0.0000	4.144E-05	0.0000	0.000E+00	0.0000	7.283E-03	0.0024	2.848E-04	0.0001	1.176E-03	0.0004	4.338E-04	0.0001
U-235	2.311E-03	0.0008	3.342E-06	0.0000	0.000E+00	0.0000	8.891E-04	0.0003	7.248E-05	0.0000	7.956E-05	0.0000	3.905E-05	0.0000
U-238	4.994E-03	0.0017	2.894E-05	0.0000	0.000E+00	0.0000	5.305E-03	0.0018	2.102E-04	0.0001	8.760E-04	0.0003	3.213E-04	0.0001
Total	2.087E-02	0.0070	1.206E-03	0.0004	0.000E+00	0.0000	3.139E-01	0.1047	7.322E-03	0.0024	2.520E-03	0.0008	4.620E-02	0.0154

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-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	7.860E-01	0.2622	1.519E-03	0.0005	0.000E+00	0.0000	4.427E-01	0.1476	5.593E-04	0.0002	1.244E-04	0.0000	1.324E+00	0.4415
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cm-245	1.593E-01	0.0531	3.079E-04	0.0001	0.000E+00	0.0000	8.972E-02	0.0299	8.121E-05	0.0000	2.510E-05	0.0000	2.949E-01	0.0983
Co-60	1.208E-19	0.0000	2.336E-21	0.0000	0.000E+00	0.0000	6.925E-20	0.0000	3.432E-20	0.0000	1.915E-20	0.0000	1.419E-18	0.0000
Cs-137	6.567E-05	0.0000	8.467E-06	0.0000	0.000E+00	0.0000	3.732E-05	0.0000	2.802E-05	0.0000	4.164E-05	0.0000	2.145E-04	0.0001
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ni-63	4.864E-04	0.0002	3.134E-06	0.0000	0.000E+00	0.0000	2.769E-04	0.0001	3.450E-05	0.0000	7.701E-04	0.0003	1.866E-03	0.0006
Pu-238	4.581E-03	0.0015	8.843E-06	0.0000	0.000E+00	0.0000	2.580E-03	0.0009	6.519E-06	0.0000	8.069E-07	0.0000	9.084E-03	0.0030
Pu-239	5.294E-01	0.1766	1.023E-03	0.0003	0.000E+00	0.0000	2.982E-01	0.0994	7.498E-04	0.0003	4.187E-05	0.0000	1.050E+00	0.3502
Pu-241	5.642E-02	0.0188	1.091E-04	0.0000	0.000E+00	0.0000	3.177E-02	0.0106	4.013E-05	0.0000	8.927E-06	0.0000	9.471E-02	0.0316
Sr-90	7.178E-08	0.0000	2.777E-10	0.0000	0.000E+00	0.0000	4.311E-08	0.0000	8.229E-09	0.0000	1.144E-08	0.0000	1.540E-07	0.0000
U-234	6.231E-02	0.0208	4.842E-05	0.0000	0.000E+00	0.0000	3.511E-02	0.0117	3.042E-04	0.0001	2.951E-03	0.0010	1.100E-01	0.0367
U-235	1.494E-02	0.0050	1.213E-05	0.0000	0.000E+00	0.0000	8.419E-03	0.0028	2.351E-04	0.0001	2.111E-04	0.0001	2.721E-02	0.0091
U-238	4.620E-02	0.0154	2.977E-05	0.0000	0.000E+00	0.0000	2.603E-02	0.0087	2.225E-04	0.0001	2.192E-03	0.0007	8.641E-02	0.0288
Total	1.660E+00	0.5536	3.071E-03	0.0010	0.000E+00	0.0000	9.348E-01	0.3118	2.261E-03	0.0008	6.368E-03	0.0021	2.998E+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-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	9.627E-04	0.0007	6.995E-05	0.0000	0.000E+00	0.0000	1.875E-02	0.0132	2.675E-04	0.0002	2.425E-05	0.0000	2.794E-03	0.0020
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cm-245	8.302E-03	0.0059	1.292E-04	0.0001	0.000E+00	0.0000	3.420E-02	0.0241	3.236E-04	0.0002	4.452E-05	0.0000	5.167E-03	0.0036
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	1.283E-20	0.0000	9.047E-28	0.0000	0.000E+00	0.0000	1.825E-21	0.0000	6.443E-22	0.0000	5.473E-22	0.0000	6.908E-24	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ni-63	0.000E+00	0.0000	1.337E-13	0.0000	0.000E+00	0.0000	1.972E-08	0.0000	1.021E-09	0.0000	1.352E-08	0.0000	5.976E-11	0.0000
Pu-238	5.302E-08	0.0000	2.633E-08	0.0000	0.000E+00	0.0000	6.682E-06	0.0000	1.960E-07	0.0000	1.159E-07	0.0000	9.336E-07	0.0000
Pu-239	6.004E-05	0.0000	6.349E-04	0.0004	0.000E+00	0.0000	1.687E-01	0.1190	4.790E-03	0.0034	1.105E-04	0.0001	2.552E-02	0.0180
Pu-241	6.594E-05	0.0000	4.794E-06	0.0000	0.000E+00	0.0000	1.284E-03	0.0009	1.832E-05	0.0000	1.662E-06	0.0000	1.915E-04	0.0001
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	3.931E-04	0.0003	2.312E-05	0.0000	0.000E+00	0.0000	4.877E-03	0.0034	1.732E-04	0.0001	6.662E-04	0.0005	2.496E-04	0.0002
U-235	1.266E-03	0.0009	2.053E-06	0.0000	0.000E+00	0.0000	6.319E-04	0.0004	5.821E-05	0.0000	4.353E-05	0.0000	2.504E-05	0.0000
U-238	2.717E-03	0.0019	1.578E-05	0.0000	0.000E+00	0.0000	2.893E-03	0.0020	1.146E-04	0.0001	4.776E-04	0.0003	1.752E-04	0.0001
Total	1.377E-02	0.0097	8.798E-04	0.0006	0.000E+00	0.0000	2.313E-01	0.1632	5.745E-03	0.0041	1.368E-03	0.0010	3.413E-02	0.0241

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-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	1.418E-01	0.1001	2.742E-04	0.0002	0.000E+00	0.0000	7.988E-02	0.0564	1.031E-04	0.0001	2.249E-05	0.0000	2.450E-01	0.1729
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cm-245	1.581E-01	0.1115	3.056E-04	0.0002	0.000E+00	0.0000	8.903E-02	0.0628	9.228E-05	0.0001	2.495E-05	0.0000	2.957E-01	0.2086
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	2.311E-20	0.0000	2.960E-21	0.0000	0.000E+00	0.0000	1.314E-20	0.0000	9.662E-21	0.0000	1.466E-20	0.0000	7.961E-20	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ni-63	4.186E-08	0.0000	2.698E-10	0.0000	0.000E+00	0.0000	2.383E-08	0.0000	2.969E-09	0.0000	6.628E-08	0.0000	1.695E-07	0.0000
Pu-238	1.696E-05	0.0000	3.165E-08	0.0000	0.000E+00	0.0000	9.554E-06	0.0000	4.180E-08	0.0000	2.140E-07	0.0000	3.481E-05	0.0000
Pu-239	3.548E-01	0.2503	6.858E-04	0.0005	0.000E+00	0.0000	1.998E-01	0.1410	5.025E-04	0.0004	2.807E-05	0.0000	7.556E-01	0.5331
Pu-241	1.018E-02	0.0072	1.968E-05	0.0000	0.000E+00	0.0000	5.733E-03	0.0040	7.394E-06	0.0000	1.614E-06	0.0000	1.751E-02	0.0124
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	2.723E-02	0.0192	5.383E-05	0.0000	0.000E+00	0.0000	1.534E-02	0.0108	1.483E-04	0.0001	1.264E-03	0.0009	5.042E-02	0.0356
U-235	9.063E-03	0.0064	7.598E-06	0.0000	0.000E+00	0.0000	5.116E-03	0.0036	1.504E-04	0.0001	8.896E-05	0.0001	1.647E-02	0.0116
U-238	1.865E-02	0.0132	1.204E-05	0.0000	0.000E+00	0.0000	1.051E-02	0.0074	8.982E-05	0.0001	8.849E-04	0.0006	3.653E-02	0.0258
Total	7.199E-01	0.5079	1.359E-03	0.0010	0.000E+00	0.0000	4.054E-01	0.2861	1.094E-03	0.0008	2.316E-03	0.0016	1.417E+00	1.0000

* all water independent and dependent pathways.

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

Parent (i)	Product (j)	Branch Fraction*	DSR(j,t) (mrem/yr)/(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
Am-241	Am-241	1.000E+00	6.524E+00	6.509E+00	6.479E+00	6.374E+00	6.083E+00	5.165E+00	3.227E+00	5.960E-01
Am-241	Np-237	1.000E+00	7.587E-06	1.465E-05	2.874E-05	7.737E-05	2.105E-04	6.140E-04	1.343E-03	1.557E-03
Am-241	U-233	1.000E+00	8.738E-12	2.106E-11	6.466E-11	4.106E-10	2.941E-09	2.579E-08	1.405E-07	3.040E-07
Am-241	Th-229	1.000E+00	2.372E-11	2.373E-11	2.376E-11	2.387E-11	2.478E-11	4.785E-11	4.566E-10	5.811E-09
Am-241	ΣDSR(j)		6.524E+00	6.509E+00	6.479E+00	6.374E+00	6.084E+00	5.166E+00	3.229E+00	5.975E-01
C-14	C-14	1.000E+00	1.471E+00	1.689E-01	1.984E-03	3.318E-10	9.621E-30	0.000E+00	0.000E+00	0.000E+00
Cm-245	Cm-245	1.000E+00	2.568E+00	2.567E+00	2.565E+00	2.556E+00	2.532E+00	2.447E+00	2.217E+00	1.525E+00
Cm-245	Pu-241	1.000E+00	2.389E-03	4.114E-03	7.319E-03	1.635E-02	3.005E-02	3.705E-02	3.378E-02	2.310E-02
Cm-245	Am-241	1.000E+00	5.132E-04	1.421E-03	4.553E-03	2.717E-02	1.536E-01	7.443E-01	1.961E+00	2.675E+00
Cm-245	Np-237	1.000E+00	3.100E-10	9.891E-10	6.175E-09	1.086E-07	1.901E-06	3.516E-05	3.216E-04	1.783E-03
Cm-245	U-233	1.000E+00	1.115E-11	1.116E-11	1.114E-11	1.142E-11	2.553E-11	8.848E-10	2.195E-08	2.506E-07
Cm-245	Th-229	1.000E+00	1.494E-10	1.493E-10	1.491E-10	1.487E-10	1.526E-10	1.467E-10	1.924E-10	2.910E-09
Cm-245	ΣDSR(j)		2.571E+00	2.573E+00	2.577E+00	2.600E+00	2.715E+00	3.229E+00	4.213E+00	4.224E+00
Cm-245	Cm-245	2.450E-05	6.293E-05	6.290E-05	6.284E-05	6.263E-05	6.203E-05	5.996E-05	5.433E-05	3.735E-05
Cm-245	Pu-241	2.450E-05	5.854E-08	1.008E-07	1.793E-07	4.006E-07	7.362E-07	9.076E-07	8.277E-07	5.658E-07
Cm-245	Np-237	2.450E-05	5.815E-12	1.824E-11	6.543E-11	4.299E-10	2.555E-09	1.316E-08	4.018E-08	8.729E-08
Cm-245	U-233	2.450E-05	2.814E-16	2.958E-16	3.820E-16	1.903E-15	2.684E-14	4.606E-13	3.707E-12	1.428E-11
Cm-245	Th-229	2.450E-05	3.653E-15	3.651E-15	3.648E-15	3.639E-15	3.741E-15	4.032E-15	1.386E-14	2.166E-13
Cm-245	ΣDSR(j)		6.299E-05	6.300E-05	6.302E-05	6.303E-05	6.277E-05	6.086E-05	5.520E-05	3.801E-05
Co-60	Co-60	1.000E+00	7.479E+00	6.487E+00	4.881E+00	1.803E+00	1.048E-01	4.961E-06	2.183E-18	0.000E+00
Cs-137	Cs-137	1.000E+00	1.109E+01	1.054E+01	9.527E+00	6.681E+00	2.424E+00	6.973E-02	2.748E-06	1.020E-21
H-3	H-3	1.000E+00	7.005E-02	1.634E-02	8.749E-04	3.060E-08	4.984E-21	0.000E+00	0.000E+00	0.000E+00
Ni-63	Ni-63	1.000E+00	3.207E-02	3.165E-02	3.082E-02	2.810E-02	2.156E-02	8.540E-03	6.040E-04	5.487E-08
Pu-238	Pu-238	1.000E+00	1.819E+00	1.804E+00	1.775E+00	1.675E+00	1.419E+00	7.944E-01	1.511E-01	4.400E-04
Pu-238	U-234	1.000E+00	4.345E-06	7.465E-06	1.363E-05	3.429E-05	8.616E-05	2.035E-04	2.746E-04	1.284E-04
Pu-238	Th-230	1.000E+00	6.055E-12	1.109E-11	2.609E-11	1.304E-10	8.354E-10	6.864E-09	3.688E-08	1.281E-07
Pu-238	Ra-226	1.000E+00	3.973E-12	4.495E-12	7.536E-12	6.557E-11	1.247E-09	3.439E-08	5.140E-07	3.788E-06
Pu-238	Pb-210	1.000E+00	2.087E-11	2.164E-11	2.398E-11	4.397E-11	7.198E-10	4.226E-08	9.724E-07	7.859E-06
Pu-238	ΣDSR(j)		1.819E+00	1.804E+00	1.775E+00	1.675E+00	1.419E+00	7.946E-01	1.514E-01	5.802E-04
Pu-239	Pu-239	1.000E+00	2.021E+00	2.020E+00	2.018E+00	2.012E+00	1.996E+00	1.938E+00	1.780E+00	1.281E+00
Pu-239	U-235	1.000E+00	1.568E-09	2.890E-09	5.533E-09	1.472E-08	4.044E-08	1.245E-07	3.191E-07	6.216E-07
Pu-239	Pa-231	1.000E+00	9.303E-12	1.618E-11	4.086E-11	2.393E-10	1.715E-09	1.568E-08	9.689E-08	3.404E-07
Pu-239	Ac-227	1.000E+00	7.561E-12	8.241E-12	1.253E-11	8.788E-11	1.354E-09	2.457E-08	2.046E-07	7.842E-07
Pu-239	ΣDSR(j)		2.021E+00	2.020E+00	2.018E+00	2.012E+00	1.996E+00	1.938E+00	1.780E+00	1.281E+00

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

Parent (i)	Product (j)	Branch Fraction*	DSR(j,t) (mrem/yr)/(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
Pu-241	Pu-241	1.000E+00	3.818E-02	3.637E-02	3.301E-02	2.350E-02	8.906E-03	2.982E-04	1.816E-08	3.101E-23
Pu-241	Am-241	1.000E+00	1.477E-02	2.471E-02	4.315E-02	9.455E-02	1.688E-01	1.854E-01	1.169E-01	2.156E-02
Pu-241	Np-237	1.000E+00	8.501E-09	2.615E-08	9.254E-08	6.002E-07	3.507E-06	1.707E-05	4.380E-05	5.319E-05
Pu-241	U-233	1.000E+00	3.088E-14	5.312E-14	1.798E-13	2.346E-12	3.736E-11	6.219E-10	4.422E-09	1.052E-08
Pu-241	Th-229	1.000E+00	2.665E-13	2.927E-13	3.416E-13	4.805E-13	7.020E-13	1.308E-12	1.299E-11	1.867E-10
Pu-241	ΣDSR(j)		5.295E-02	6.108E-02	7.616E-02	1.181E-01	1.777E-01	1.857E-01	1.169E-01	2.162E-02
Pu-241	Pu-241	2.450E-05	9.354E-07	8.911E-07	8.087E-07	5.758E-07	2.182E-07	7.307E-09	4.448E-13	7.597E-28
Pu-241	Np-237	2.450E-05	1.846E-10	3.501E-10	6.583E-10	1.525E-09	2.826E-09	3.407E-09	2.854E-09	1.468E-09
Pu-241	U-233	2.450E-05	1.734E-16	4.754E-16	1.506E-15	8.854E-15	4.901E-14	2.218E-13	4.789E-13	3.628E-13
Pu-241	Th-229	2.450E-05	7.513E-18	8.821E-18	1.131E-17	1.916E-17	4.356E-17	2.767E-16	2.072E-15	1.075E-14
Pu-241	ΣDSR(j)		9.356E-07	8.914E-07	8.093E-07	5.773E-07	2.210E-07	1.071E-08	2.855E-09	1.468E-09
Sr-90	Sr-90	1.000E+00	3.980E+01	3.700E+01	3.196E+01	1.915E+01	4.433E+00	2.645E-02	1.164E-08	6.343E-31
U-234	U-234	1.000E+00	1.113E+00	1.112E+00	1.109E+00	1.100E+00	1.074E+00	9.885E-01	7.774E-01	3.216E-01
U-234	Th-230	1.000E+00	1.427E-06	2.074E-06	3.305E-06	7.593E-06	1.969E-05	6.025E-05	1.622E-04	3.963E-04
U-234	Ra-226	1.000E+00	1.430E-07	2.925E-07	8.765E-07	5.866E-06	4.428E-05	4.213E-04	2.799E-03	1.236E-02
U-234	Pb-210	1.000E+00	4.006E-07	4.148E-07	5.033E-07	2.113E-06	3.040E-05	5.991E-04	5.587E-03	2.578E-02
U-234	ΣDSR(j)		1.113E+00	1.112E+00	1.109E+00	1.100E+00	1.074E+00	9.896E-01	7.860E-01	3.601E-01
	U-235	1.000E+00	1.347E+00	1.346E+00	1.343E+00	1.332E+00	1.303E+00	1.205E+00	9.629E-01	4.287E-01
U-235	Pa-231	1.000E+00	5.166E-03	8.863E-03	1.621E-02	4.135E-02	1.082E-01	2.924E-01	5.292E-01	3.589E-01
U-235	Ac-227	1.000E+00	4.020E-04	1.095E-03	3.460E-03	2.053E-02	1.173E-01	5.618E-01	1.229E+00	8.598E-01
U-235	ΣDSR(j)		1.353E+00	1.355E+00	1.362E+00	1.394E+00	1.528E+00	2.059E+00	2.721E+00	1.647E+00
U-238	U-238	1.000E+00	1.117E+00	1.115E+00	1.113E+00	1.104E+00	1.078E+00	9.937E-01	7.849E-01	3.312E-01
U-238	U-234	1.000E+00	4.490E-06	7.640E-06	1.391E-05	3.562E-05	9.569E-05	2.843E-04	6.646E-04	9.142E-04
U-238	Th-230	1.000E+00	2.229E-08	2.227E-08	2.223E-08	2.215E-08	2.240E-08	2.836E-08	8.195E-08	4.895E-07
U-238	Ra-226	1.000E+00	5.871E-08	5.855E-08	5.849E-08	5.804E-08	5.794E-08	9.245E-08	8.584E-07	1.218E-05
U-238	Pb-210	1.000E+00	3.090E-07	3.086E-07	3.079E-07	3.054E-07	2.987E-07	3.214E-07	1.710E-06	2.474E-05
U-238	ΣDSR(j)		1.117E+00	1.115E+00	1.113E+00	1.104E+00	1.078E+00	9.940E-01	7.855E-01	3.321E-01

*Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
The DSR includes contributions from associated (half-life ≤ 0.5 yr) 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
Am-241	3.832E+00	3.841E+00	3.859E+00	3.922E+00	4.109E+00	4.840E+00	7.743E+00	4.184E+01
C-14	1.700E+01	1.480E+02	1.260E+04	7.535E+10	*4.454E+12	*4.454E+12	*4.454E+12	*4.454E+12
Cm-245	9.722E+00	9.717E+00	9.702E+00	9.616E+00	9.207E+00	7.743E+00	5.935E+00	5.918E+00
Co-60	3.343E+00	3.854E+00	5.122E+00	1.386E+01	2.385E+02	5.039E+06	*1.131E+15	*1.131E+15
Cs-137	2.254E+00	2.371E+00	2.624E+00	3.742E+00	1.031E+01	3.585E+02	9.096E+06	*8.701E+13
H-3	3.569E+02	1.530E+03	2.658E+04	8.171E+08	*9.594E+15	*9.594E+15	*9.594E+15	*9.594E+15
Ni-63	7.796E+02	7.899E+02	8.111E+02	8.896E+02	1.159E+03	2.928E+03	4.139E+04	4.556E+08
Pu-238	1.374E+01	1.386E+01	1.409E+01	1.493E+01	1.762E+01	3.146E+01	1.651E+02	4.309E+04
Pu-239	1.237E+01	1.238E+01	1.239E+01	1.242E+01	1.253E+01	1.290E+01	1.405E+01	1.952E+01
Pu-241	4.722E+02	4.093E+02	3.283E+02	2.118E+02	1.407E+02	1.346E+02	2.138E+02	1.157E+03
Sr-90	6.282E-01	6.757E-01	7.822E-01	1.305E+00	5.639E+00	9.453E+02	2.147E+09	*1.365E+14
U-234	2.246E+01	2.249E+01	2.254E+01	2.273E+01	2.327E+01	2.526E+01	3.181E+01	6.942E+01
U-235	1.848E+01	1.844E+01	1.835E+01	1.793E+01	1.636E+01	1.214E+01	9.187E+00	1.517E+01
U-238	2.239E+01	2.241E+01	2.247E+01	2.265E+01	2.318E+01	2.515E+01	3.183E+01	7.527E+01

*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)
Am-241	4.100E-01	0.000E+00	6.524E+00	3.832E+00	6.524E+00	3.832E+00
C-14	1.970E+00	0.000E+00	1.471E+00	1.700E+01	1.471E+00	1.700E+01
Cm-245	7.000E-02	600 ± 1	4.625E+00	5.406E+00	2.571E+00	9.722E+00
Co-60	6.500E-01	0.000E+00	7.479E+00	3.343E+00	7.479E+00	3.343E+00
Cs-137	7.804E+01	0.000E+00	1.109E+01	2.254E+00	1.109E+01	2.254E+00
H-3	8.300E-01	0.000E+00	7.005E-02	3.569E+02	7.005E-02	3.569E+02
Ni-63	3.090E+00	0.000E+00	3.207E-02	7.796E+02	3.207E-02	7.796E+02
Pu-238	6.000E-02	0.000E+00	1.819E+00	1.374E+01	1.819E+00	1.374E+01
Pu-239	5.900E-01	0.000E+00	2.021E+00	1.237E+01	2.021E+00	1.237E+01
Pu-241	8.100E-01	60.1 ± 0.1	1.955E-01	1.279E+02	5.295E-02	4.722E+02
Sr-90	1.323E+01	0.000E+00	3.980E+01	6.282E-01	3.980E+01	6.282E-01
U-234	1.400E-01	0.000E+00	1.113E+00	2.246E+01	1.113E+00	2.246E+01
U-235	1.000E-02	351.4 ± 0.7	2.741E+00	9.120E+00	1.353E+00	1.848E+01
U-238	1.100E-01	0.000E+00	1.117E+00	2.239E+01	1.117E+00	2.239E+01

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

Nuclide (j)	Parent (i)	BRF(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
Am-241	Am-241	1.000E+00	2.675E+00	2.669E+00	2.656E+00	2.613E+00	2.494E+00	2.118E+00	1.323E+00	2.443E-01
Am-241	Cm-245	1.000E+00	3.592E-05	9.947E-05	3.187E-04	1.902E-03	1.075E-02	5.210E-02	1.373E-01	1.872E-01
Am-241	Pu-241	1.000E+00	1.196E-02	2.002E-02	3.495E-02	7.659E-02	1.367E-01	1.502E-01	9.468E-02	1.747E-02
Am-241	ΣDOSE(j)		2.687E+00	2.689E+00	2.692E+00	2.692E+00	2.642E+00	2.320E+00	1.555E+00	4.491E-01
Np-237	Am-241	1.000E+00	3.111E-06	6.006E-06	1.178E-05	3.172E-05	8.631E-05	2.517E-04	5.506E-04	6.383E-04
Np-237	Cm-245	1.000E+00	2.170E-11	6.924E-11	4.322E-10	7.600E-09	1.331E-07	2.461E-06	2.251E-05	1.248E-04
Np-237	Cm-245	2.450E-05	4.070E-13	1.277E-12	4.580E-12	3.010E-11	1.788E-10	9.215E-10	2.813E-09	6.110E-09
Np-237	Pu-241	1.000E+00	6.886E-09	2.118E-08	7.496E-08	4.862E-07	2.840E-06	1.383E-05	3.547E-05	4.308E-05
Np-237	Pu-241	2.450E-05	1.495E-10	2.835E-10	5.332E-10	1.235E-09	2.289E-09	2.759E-09	2.312E-09	1.189E-09
Np-237	ΣDOSE(j)		3.116E-06	6.028E-06	1.186E-05	3.222E-05	8.928E-05	2.680E-04	6.085E-04	8.062E-04
U-233	Am-241	1.000E+00	3.563E-12	8.637E-12	2.651E-11	1.684E-10	1.206E-09	1.057E-08	5.761E-08	1.247E-07
U-233	Cm-245	1.000E+00	7.803E-13	7.810E-13	7.795E-13	7.996E-13	1.787E-12	6.193E-11	1.536E-09	1.754E-08
U-233	Cm-245	2.450E-05	1.970E-17	2.070E-17	2.674E-17	1.332E-16	1.679E-15	3.224E-14	2.595E-13	9.999E-13
U-233	Pu-241	1.000E+00	2.501E-14	4.303E-14	1.456E-13	1.901E-12	3.026E-11	5.038E-10	3.582E-09	8.520E-09
U-233	Pu-241	2.450E-05	1.404E-16	3.851E-16	1.220E-15	7.172E-15	3.970E-14	1.797E-13	3.879E-13	2.939E-13
U-233	ΣDOSE(j)		4.388E-12	9.461E-12	2.744E-11	1.711E-10	1.238E-09	1.114E-08	6.273E-08	1.507E-07
Th-229	Am-241	1.000E+00	9.726E-12	9.730E-12	9.740E-12	9.788E-12	1.016E-11	1.962E-11	1.872E-10	2.383E-09
Th-229	Cm-245	1.000E+00	1.045E-11	1.045E-11	1.044E-11	1.041E-11	1.068E-11	1.041E-11	1.347E-11	2.037E-10
Th-229	Cm-245	2.450E-05	2.557E-16	2.556E-16	2.554E-16	2.547E-16	2.619E-16	2.822E-16	9.705E-16	1.516E-14
Th-229	Pu-241	1.000E+00	2.159E-13	2.371E-13	2.767E-13	3.892E-13	5.686E-13	1.060E-12	1.052E-11	1.512E-10
Th-229	Pu-241	2.450E-05	6.085E-18	7.145E-18	9.159E-18	1.552E-17	3.528E-17	2.241E-16	1.678E-15	8.707E-15
Th-229	ΣDOSE(j)		2.040E-11	2.042E-11	2.046E-11	2.059E-11	2.141E-11	3.109E-11	2.112E-10	2.738E-09
C-14	C-14	1.000E+00	2.897E+00	3.328E-01	3.909E-03	6.536E-10	1.877E-29	0.000E+00	0.000E+00	0.000E+00
Cm-245	Cm-245	1.000E+00	1.798E-01	1.797E-01	1.795E-01	1.789E-01	1.772E-01	1.713E-01	1.552E-01	1.067E-01
Cm-245	Cm-245	2.450E-05	4.405E-06	4.403E-06	4.399E-06	4.384E-06	4.342E-06	4.197E-06	3.803E-06	2.615E-06
Cm-245	ΣDOSE(j)		1.798E-01	1.797E-01	1.795E-01	1.789E-01	1.772E-01	1.713E-01	1.552E-01	1.067E-01
Pu-241	Cm-245	1.000E+00	1.672E-04	2.880E-04	5.123E-04	1.145E-03	2.103E-03	2.593E-03	2.365E-03	1.617E-03
Pu-241	Pu-241	1.000E+00	3.092E-02	2.946E-02	2.674E-02	1.904E-02	7.214E-03	2.416E-04	1.471E-08	2.512E-23
Pu-241	ΣDOSE(j)		3.109E-02	2.975E-02	2.725E-02	2.018E-02	9.317E-03	2.835E-03	2.365E-03	1.617E-03
Pu-241	Cm-245	2.450E-05	4.098E-09	7.055E-09	1.255E-08	2.804E-08	5.153E-08	6.353E-08	5.794E-08	3.961E-08
Pu-241	Pu-241	2.450E-05	7.577E-07	7.218E-07	6.550E-07	4.664E-07	1.767E-07	5.918E-09	3.603E-13	6.136E-28
Pu-241	ΣDOSE(j)		7.618E-07	7.288E-07	6.676E-07	4.945E-07	2.283E-07	6.945E-08	5.794E-08	3.961E-08
Co-60	Co-60	1.000E+00	4.861E+00	4.217E+00	3.173E+00	1.172E+00	6.812E-02	3.225E-06	1.419E-18	0.000E+00
Cs-137	Cs-137	1.000E+00	8.655E+02	8.228E+02	7.435E+02	5.214E+02	1.892E+02	5.441E+00	2.145E-04	7.961E-20
H-3	H-3	1.000E+00	5.814E-02	1.356E-02	7.261E-04	2.539E-08	4.137E-21	0.000E+00	0.000E+00	0.000E+00
Ni-63	Ni-63	1.000E+00	9.909E-02	9.779E-02	9.524E-02	8.682E-02	6.663E-02	2.639E-02	1.866E-03	1.695E-07
Pu-238	Pu-238	1.000E+00	1.092E-01	1.083E-01	1.065E-01	1.005E-01	8.514E-02	4.766E-02	9.067E-03	2.640E-05

mmary : RESRAD Default Parameters
le : Plumbrook Subsurface Modified HL CORE MIX.RAD

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

uclide (j)	Parent (i)	BRF(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
-234	Pu-238	1.000E+00	2.607E-07	4.479E-07	8.176E-07	2.057E-06	5.170E-06	1.221E-05	1.647E-05	7.703E-06
J-234	U-234	1.000E+00	1.556E-01	1.556E-01	1.553E-01	1.540E-01	1.504E-01	1.384E-01	1.088E-01	4.502E-02
J-234	U-238	1.000E+00	4.936E-07	8.404E-07	1.530E-06	3.918E-06	1.053E-05	3.127E-05	7.310E-05	1.006E-04
J-234	∑DOSE(j)		1.556E-01	1.556E-01	1.553E-01	1.540E-01	1.504E-01	1.384E-01	1.089E-01	4.513E-02
Th-230	Pu-238	1.000E+00	3.633E-13	6.653E-13	1.566E-12	7.824E-12	5.012E-11	4.119E-10	2.213E-09	7.686E-09
Th-230	U-234	1.000E+00	1.996E-07	2.904E-07	4.626E-07	1.063E-06	2.756E-06	8.435E-06	2.271E-05	5.548E-05
Th-230	U-238	1.000E+00	2.452E-09	2.450E-09	2.446E-09	2.437E-09	2.463E-09	3.120E-09	9.015E-09	5.384E-08
Th-230	∑DOSE(j)		2.023E-07	2.928E-07	4.651E-07	1.065E-06	2.759E-06	8.439E-06	2.272E-05	5.554E-05
Ra-226	Pu-238	1.000E+00	2.384E-13	2.697E-13	4.521E-13	3.934E-12	7.485E-11	2.063E-09	3.084E-08	2.273E-07
Ra-226	U-234	1.000E+00	2.002E-08	4.095E-08	1.227E-07	8.213E-07	6.199E-06	5.899E-05	3.918E-04	1.731E-03
Ra-226	U-238	1.000E+00	6.458E-09	6.441E-09	6.434E-09	6.385E-09	6.373E-09	1.017E-08	9.443E-08	1.340E-06
Ra-226	∑DOSE(j)		2.648E-08	4.739E-08	1.291E-07	8.277E-07	6.205E-06	5.900E-05	3.919E-04	1.732E-03
Pb-210	Pu-238	1.000E+00	1.252E-12	1.311E-12	1.439E-12	2.638E-12	4.319E-11	2.536E-09	5.835E-08	4.715E-07
Pb-210	U-234	1.000E+00	5.608E-08	5.808E-08	7.046E-08	2.959E-07	4.256E-06	8.388E-05	7.822E-04	3.610E-03
Pb-210	U-238	1.000E+00	3.399E-08	3.395E-08	3.387E-08	3.359E-08	3.286E-08	3.535E-08	1.881E-07	2.722E-06
Pb-210	∑DOSE(j)		9.007E-08	9.203E-08	1.043E-07	3.294E-07	4.289E-06	8.392E-05	7.824E-04	3.613E-03
9	Pu-239	1.000E+00	1.192E+00	1.192E+00	1.191E+00	1.187E+00	1.178E+00	1.144E+00	1.050E+00	7.556E-01
U-235	Pu-239	1.000E+00	9.249E-10	1.705E-09	3.264E-09	8.685E-09	2.386E-08	7.348E-08	1.883E-07	3.667E-07
U-235	U-235	1.000E+00	1.347E-02	1.346E-02	1.343E-02	1.332E-02	1.303E-02	1.205E-02	9.629E-03	4.287E-03
U-235	∑DOSE(j)		1.347E-02	1.346E-02	1.343E-02	1.332E-02	1.303E-02	1.205E-02	9.629E-03	4.288E-03
Pa-231	Pu-239	1.000E+00	5.489E-12	9.549E-12	2.411E-11	1.412E-10	1.012E-09	9.251E-09	5.716E-08	2.008E-07
Pa-231	U-235	1.000E+00	5.166E-05	8.863E-05	1.621E-04	4.135E-04	1.082E-03	2.924E-03	5.292E-03	3.589E-03
Pa-231	∑DOSE(j)		5.166E-05	8.863E-05	1.621E-04	4.135E-04	1.082E-03	2.924E-03	5.292E-03	3.589E-03
Ac-227	Pu-239	1.000E+00	4.461E-12	4.862E-12	7.392E-12	5.185E-11	7.986E-10	1.449E-08	1.207E-07	4.627E-07
Ac-227	U-235	1.000E+00	4.020E-06	1.095E-05	3.460E-05	2.053E-04	1.173E-03	5.618E-03	1.229E-02	8.598E-03
Ac-227	∑DOSE(j)		4.020E-06	1.095E-05	3.460E-05	2.053E-04	1.173E-03	5.618E-03	1.229E-02	8.599E-03
Sr-90	Sr-90	1.000E+00	5.265E+02	4.895E+02	4.228E+02	2.534E+02	5.865E+01	3.499E-01	1.540E-07	0.000E+00
U-238	U-238	1.000E+00	1.226E-01	1.227E-01	1.224E-01	1.214E-01	1.186E-01	1.093E-01	8.633E-02	3.643E-02

BRF(i) is the branch fraction of the parent nuclide.

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

clide (j)	Parent (i)	SRF(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
ɔ-241	Am-241	1.000E+00	4.100E-01	4.092E-01	4.075E-01	4.018E-01	3.859E-01	3.351E-01	2.238E-01	5.446E-02
n-241	Cm-245	1.000E+00	0.000E+00	2.657E-06	2.313E-05	2.297E-04	1.546E-03	8.105E-03	2.311E-02	4.169E-02
n-241	Pu-241	1.000E+00	0.000E+00	1.267E-03	3.617E-03	1.019E-02	1.984E-02	2.274E-02	1.534E-02	3.733E-03
n-241	∑S(j):		4.100E-01	4.104E-01	4.112E-01	4.122E-01	4.073E-01	3.659E-01	2.622E-01	9.990E-02
p-237	Am-241	1.000E+00	0.000E+00	1.326E-07	3.968E-07	1.310E-06	3.824E-06	1.159E-05	2.660E-05	3.627E-05
ɒp-237	Cm-245	1.000E+00	0.000E+00	2.680E-13	7.582E-12	2.577E-10	5.555E-09	1.118E-07	1.084E-06	7.088E-06
ɒp-237	Cm-245	2.450E-05	0.000E+00	1.315E-14	1.146E-13	1.142E-12	7.760E-12	4.233E-11	1.359E-10	3.472E-10
ɒp-237	Pu-241	1.000E+00	0.000E+00	2.068E-10	1.800E-09	1.786E-08	1.197E-07	6.177E-07	1.669E-06	2.392E-06
ɒp-237	Pu-241	2.450E-05	0.000E+00	6.273E-12	1.793E-11	5.079E-11	1.006E-10	1.248E-10	1.091E-10	6.604E-11
Np-237	∑S(j):		0.000E+00	1.328E-07	3.986E-07	1.328E-06	3.949E-06	1.232E-05	2.935E-05	4.575E-05
U-233	Am-241	1.000E+00	0.000E+00	2.898E-13	2.597E-12	2.842E-11	2.451E-10	2.349E-09	1.399E-08	4.085E-08
U-233	Cm-245	1.000E+00	0.000E+00	3.155E-19	2.500E-17	2.866E-15	1.904E-13	1.333E-11	3.712E-10	5.746E-09
U-233	Cm-245	2.450E-05	0.000E+00	1.923E-20	5.059E-19	1.714E-17	3.663E-16	7.128E-15	6.302E-14	3.279E-13
U-233	Pu-241	1.000E+00	0.000E+00	3.025E-16	7.950E-15	2.685E-13	5.681E-12	1.064E-10	8.308E-10	2.669E-09
U-233	Pu-241	2.450E-05	0.000E+00	1.381E-17	1.201E-16	1.186E-15	7.853E-15	3.857E-14	9.042E-14	9.216E-14
U-233	∑S(j):		0.000E+00	2.901E-13	2.605E-12	2.870E-11	2.510E-10	2.469E-09	1.519E-08	4.926E-08
Th-229	Am-241	1.000E+00	0.000E+00	9.126E-18	2.456E-16	8.993E-15	2.351E-13	7.782E-12	1.540E-10	2.138E-09
[illegible]	Cm-245	1.000E+00	0.000E+00	5.969E-24	1.424E-21	5.508E-19	1.132E-16	2.862E-14	2.701E-12	1.756E-10
[illegible].9	Cm-245	2.450E-05	0.000E+00	4.553E-25	3.611E-23	4.151E-21	2.780E-19	2.007E-17	6.148E-16	1.344E-14
Th-229	Pu-241	1.000E+00	0.000E+00	7.161E-21	5.676E-19	6.507E-17	4.326E-15	3.034E-13	8.503E-12	1.354E-10
Th-229	Pu-241	2.450E-05	0.000E+00	4.366E-22	1.149E-20	3.893E-19	8.323E-18	1.624E-16	1.448E-15	7.825E-15
Th-229	∑S(j):		0.000E+00	9.133E-18	2.462E-16	9.059E-15	2.395E-13	8.114E-12	1.652E-10	2.449E-09
C-14	C-14	1.000E+00	1.970E+00	2.140E-01	2.514E-03	4.214E-10	1.231E-29	0.000E+00	0.000E+00	0.000E+00
Cm-245	Cm-245	1.000E+00	7.000E-02	6.998E-02	6.995E-02	6.985E-02	6.955E-02	6.851E-02	6.562E-02	5.643E-02
Cm-245	Cm-245	2.450E-05	1.715E-06	1.715E-06	1.714E-06	1.711E-06	1.704E-06	1.678E-06	1.608E-06	1.383E-06
Cm-245	∑S(j):		7.000E-02	6.998E-02	6.995E-02	6.985E-02	6.955E-02	6.851E-02	6.562E-02	5.643E-02
Pu-241	Cm-245	1.000E+00	0.000E+00	3.289E-03	9.408E-03	2.670E-02	5.320E-02	6.809E-02	6.576E-02	5.655E-02
Pu-241	Pu-241	1.000E+00	8.100E-01	7.718E-01	7.008E-01	5.000E-01	1.905E-01	6.502E-03	4.190E-07	9.001E-22
Pu-241	∑S(j):		8.100E-01	7.751E-01	7.102E-01	5.267E-01	2.437E-01	7.459E-02	6.576E-02	5.655E-02
Pu-241	Cm-245	2.450E-05	0.000E+00	8.058E-08	2.305E-07	6.541E-07	1.303E-06	1.668E-06	1.611E-06	1.385E-06
Pu-241	Pu-241	2.450E-05	1.984E-05	1.891E-05	1.717E-05	1.225E-05	4.667E-06	1.593E-07	1.027E-11	2.205E-26
Pu-241	∑S(j):		1.984E-05	1.899E-05	1.740E-05	1.290E-05	5.970E-06	1.828E-06	1.611E-06	1.385E-06
Co-60	Co-60	1.000E+00	6.500E-01	5.638E-01	4.243E-01	1.568E-01	9.126E-03	4.339E-07	1.934E-19	0.000E+00
Cs-137	Cs-137	1.000E+00	7.804E+01	7.420E+01	6.709E+01	4.714E+01	1.720E+01	5.050E-01	2.115E-05	1.005E-20
H-3	H-3	1.000E+00	8.300E-01	1.923E-01	1.031E-02	3.619E-07	5.964E-20	0.000E+00	0.000E+00	0.000E+00
[illegible]3	Ni-63	1.000E+00	3.090E+00	3.050E+00	2.972E+00	2.715E+00	2.096E+00	6.470E-01	6.364E-02	7.398E-06
Pu-238	Pu-238	1.000E+00	6.000E-02	5.952E-02	5.857E-02	5.538E-02	4.718E-02	2.692E-02	5.421E-03	1.986E-05