US Army Corps of Engineers
Buffalo District
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REDACTED VERSION

REMEDIAL INVESTIGATION
NIAGARA FALLS STORAGE SITE
VICINITY PROPERTY H PRIME

Niagara County, New York

Authorized under the
Formerly Utilized Sites Remedial Action Program

Prepared by:

U.S. Army Corps of Engineers
Buffalo District
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ACRONYMNS

AAR	ARS Aleut Remediation, LLC
ac	acre
AEC	Atomic Energy Commission
ANL	Argonne National Laboratory
BCG	biota concentration guide
bgs	below ground surface
BTV	background threshold value
°C	degrees Celsius
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
cm	centimeter
CMSA	contaminated material storage area
CSM	conceptual site model
CWM	CWM Chemical Services LLC
d	day
DOI	digital object identifier
EPC	exposure point concentration
EU	exposure unit
°F	degrees Fahrenheit
FGR	federal guidance report
ft	feet
ft^2	square feet
FUSRAP	Formerly Utilized Sites Remedial Action Program
HHRA	human health risk assessment
HQ	hazard quotient
hr	hour
ICRP	International Commission on Radiological Protection
IDW	Investigation-derived waste
ILCR	incremental lifetime cancer risk
in	inch
IRIS	Integrated Risk Information System
KAPL	Knolls Atomic Power Laboratory
K_d	distribution coefficient
KOA	Kampground of America
L/kg	liters per kilogram
LOOW	Lake Ontario Ordnance Works
m	meter
m^2	square meter
m^3	cubic meter
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
µCi/kg	microcurie per kilogram
µg/L	micrograms per liter
µg/pCi	micrograms per picocuries
MED	Manhattan Engineer District
mg/kg	milligram per kilogram
ml	milliliter
mrem	millirem
MRL	minimal risk level
NCDOH	Niagara County Department of Health
NFSS	Niagara Falls Storage Site

NRC	Nuclear Regulatory Commission
ORAU	Oak Ridge Associated Universities
OSWER	Office of Solid Waste and Emergency Response
pCi	picocurie
pCi/g	picocuries per gram
pCi/L	picocuries per liter
rem	Roentgen equivalent man
RESRAD	residual radioactivity (software)
RI	remedial investigation
RfD_o	oral reference dose
RME	reasonable maximum exposure
ROPC	radionuclide of potential concern
ROPEC	radionuclide of potential ecological concern
RSL	regional screening level
TNT	trinitrotoluene
UCL_{95}	95% upper confidence limit on the mean
USACE	United States Army Corps of Engineers
USDOE	United States Department of Energy
USEPA	United States Environmental Protection Agency
URL	Uniform Resource Locator
UTL	upper tolerance limit
UTL_{95-95}	95% upper tolerance limit with 95% confidence
VOC	volatile organic compounds
VP H'	Vicinity Property H Prime
wk	week
yd^3	cubic yard
yr	year

EXECUTIVE SUMMARY

General

This report presents the results of the remedial investigation of Niagara Falls Storage Site (NFSS) Vicinity Property H Prime (VP H') located in the Town of Porter, Niagara County, New York. VP H' is a designated Formerly Utilized Sites Remedial Action Program (FUSRAP) site subject to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended, and the National Oil and Hazardous Substances Pollution Contingency Plan.

The lead federal agency responsible for CERCLA actions at VP H' is the United States Army Corps of Engineers (USACE) Buffalo District. The United States Department of Energy (USDOE) managed FUSRAP until October 1997 when the United States Congress transferred responsibility for FUSRAP from the USDOE to USACE. As the lead federal agency for FUSRAP, USACE has authority to address the following:

- Radioactive contamination (hazardous substance) from Manhattan Engineer District (MED)/Atomic Energy Commission (AEC) activities, or
- Other pollutants or contamination resulting from MED/AEC activities, or
- Hazardous substances, pollutants or contamination unrelated to MED/AEC activities, but which are commingled with MED/AEC waste.

No historical evidence indicated the use, storage, or disposal of "other hazardous substances, pollutants, or contamination" (i.e., chemical or non-radiological) at VP H', so USACE focused the remedial investigation on FUSRAP-eligible radioactive contaminants only. FUSRAP-eligible contaminants are primarily the result of uranium ore processing, such as isotopes of uranium, thorium, and radium. Remediation of radioactive contaminants from other activities—such as those related to Knolls Atomic Power Laboratory (KAPL), including cesium, strontium, and plutonium—are the responsibility of the USDOE Office of Environmental Management.

Site Description

The VP H' property covers an area of approximately 1.6 hectares (4 acres) and is rectangular in shape, approximately 180 by 90 meters (600 by 300 feet). It is bound on three sides by roads, including Wesson Road on the west, M Street on the south, and 5th Street on the east. The northern boundary is an out-of-service railroad track. VP H' is currently owned by CWM Chemical Services LLC (CWM). CWM restricts access to the site. The site location map is shown on Figure ES-1.

Most of the site is overgrown with pasture grass and northern shrub; maple, ash, and oak trees dominate the wooded areas. There are several low-lying areas of the site that are poorly drained and allow for standing water during periods of heavy precipitation. Phragmites are dominant within these areas.

In April 1972, the New York State Commissioner of Health imposed land use restrictions on the property with the objective of protecting public health and safety and to "minimize danger to life and property from radiation hazards." The restrictions indicate that the property cannot be used for residential purposes, schools, or hospitals, but it can be used for industrial or commercial activities. If the New York State Department of Health deemed it appropriate, these restrictions could be lifted (Wallow 1980).

Town of Porter zoning indicates that VP H' is situated in the M-2 General Industrial Zone, which allows for heavier manufacturing and processing facilities as well as offices, research, and service establishments. Prohibited uses include residences; those that may be injurious or noxious due to production or emission of dust, smoke, refuse matter, odor, gas, fumes, noise, vibration, or toxic substances or conditions; and, processing, storage or disposal of hazardous or other wastes.

Given the current general industrial zoning of the site, lack of development pressure in the area, and the nature of surrounding land use (e.g., hazardous waste landfill to the east and sanitary landfill to the southeast), it is reasonable to assume that future land use will continue to be industrial.

Since the current and reasonably anticipated future use of the site is industrial, the baseline human health risk assessment evaluates potential cancer risk, non-cancer hazard, and radiological dose to industrial use receptors, including industrial, maintenance, and construction workers, as well as trespassers.

Site History

VP H' is located within the original boundary of the former Lake Ontario Ordnance Works (LOOW), a 3,035-hectare (7,500-acre) Defense Environmental Restoration Program, Formerly Used Defense Site. The former LOOW was built for the purpose of manufacturing trinitrotoluene (TNT) during World War II. The TNT production, production support, and storage areas were constructed on approximately 1,012 hectares (2,500 acres), which included VP H'. The remaining 2,023 hectares (5,000 acres), located to the west of the production area, were left undeveloped. The TNT plant was decommissioned in July 1943 due to excess production at other TNT plants after only nine months of operation.

Beginning in 1944, the MED and its successor, the AEC, used 607 hectares (1,500 acres) in the southern portion of LOOW, including NFSS, VP H', and other surrounding vicinity properties, for storage and incineration of radioactive wastes. These wastes were primarily residues from uranium ore processing operations; however, they also included contaminated rubble and scrap from decommissioning activities, biological and miscellaneous wastes from the University of Rochester, and low-level fission-product waste from contaminated-liquid evaporators at KAPL. The LOOW discontinued receipt of radioactive waste in 1954, and after the Hooker Chemical Company conducted cleanup activities, 525 hectares (1,297 acres) of the original 607 hectares (1,500 acres) became surplus. The General Services Administration eventually sold the vicinity properties to various private, commercial, and governmental agencies. VP H' is currently owned by CWM.

Between 1970 and 1986, the USDOE and its predecessor agency, the AEC, and their contractors performed radiation surveys and collected soil, water, and sediment samples at VP H'. Based on the results of these activities, a total of approximately 3,500 cubic meters (m^3) [4,600 cubic yards (yd3)] of soil in the southeastern portion of the site was excavated. These previous investigations and associated remedial work provided the basis for the design of this remedial investigation of VP H'.

In 2000, USACE built a contaminated material storage area (CMSA) pad on VP H' to temporarily store contaminated materials generated during the removal of TNT pipelines at LOOW under the Defense Environmental Restoration Program for Formerly Used Defense Sites. The CMSA pad consisted of a stone base, geotextile, high density polyethylene liner, a second geotextile, and additional stone covering an approximately 16-meter (175-foot) square area in the southeastern corner of VP H'.

In 2004, following completion of the TNT pipeline removal project, USACE determined that the

CMSA pad was no longer needed. A contractor removed the barriers, stones, and geotextile; performed a visual survey of the pad area; and collected eight soil samples. One of these samples exhibited elevated concentrations of radium-226 and uranium-238. Based on these results, the USDOE concluded "that unassessed contamination exceeding cleanup guidelines might remain on VP H'" and with USACE's concurrence, VP H' became an active FUSRAP site (USDOE 2014). After the original CMSA pad materials were removed, the pad area was covered with a new geotextile liner and clean backfill and re-seeded.

Remedial Investigation Field Activities

Remedial investigation field activities were performed by ARS Aleut Remediation, LLC (AAR) between October 2018 and January 2019 in accordance with USACE's *Scope of Work Remedial Investigation of Vicinity Property H Prime* (USACE 2018). USACE designed this remedial investigation to identify the presence of contamination in surface and subsurface soil, groundwater, ponded water, and concrete using both a systematic and biased approach to sample collection. Biased soil samples were based on the results of a gamma walkover survey of all accessible areas of the site.

Following site clearing activities, extensive sampling of the 1.6-hectare (4-acre) property was initiated. The effort included the advancement of 89 borings to 1.5 meters (5 feet) below grade and collection of 267 soil samples; collection of three groundwater samples from existing wells, one on site and two downgradient and off-site; collection of eight water samples (or ponded water samples) from low-lying areas; and advancement of two concrete borings and collection of three concrete samples. All samples were analyzed for radium-226, radium-228, isotopic thorium, and isotopic uranium. Water samples were also analyzed for water quality parameters such as alkalinity, total dissolved solids, and anions (e.g., bromide, chloride, fluoride, nitrite, nitrate, orthophosphate, and sulfate). In addition, for the purpose of disposal, samples were analyzed for KAPL-related constituents (cesium-137, isotopic plutonium, and strontium-90).

Remedial Investigation Findings

The soil analytical data showed a few locations with relatively elevated concentrations of radium-226 and thorium-230. Groundwater and ponded water analytical data were predominantly non-detect, with detected concentrations nominally greater than background concentrations. Similarly, analytical data from the concrete pad showed no indications of impacts from past site activities.

Since the current and reasonably anticipated future use of the site is industrial, the baseline human health risk assessment evaluated potential cancer risk, non-cancer hazard, and radiological dose to industrial use receptors, including industrial, maintenance, and construction workers, as well as trespassers. The results of the baseline risk assessment showed that no current or future site receptors would be subject to risk, hazard, or dose through exposure to any site media that would be considered unacceptable based on United States Environmental Protection Agency (USEPA) and Nuclear Regulatory Commission (NRC) thresholds.

The data quality objectives identified for this remedial investigation have been accomplished:

- Defined the nature and extent of radioactive contaminants in soil, groundwater, ponded water, and concrete
- Analyzed the impact of uranium in soil on groundwater
- Prepared a baseline human health and ecological risk assessment

- Characterized investigation-derived waste for purposes of disposal
- Supported requirements of a future final status survey for site closure in accordance with Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM), if necessary

Based on an evaluation of remedial investigation data and the results of the baseline cancer risk, non-cancer hazard, and radiological dose assessment, USACE concludes that environmental media at VP H' pose no unacceptable risk or dose to current or future receptors under the industrial land use scenario. Therefore, no remedial action is required.

1 PROJECT INTRODUCTION

1.1 Authority to Conduct the Remedial Investigation

In 1997, Congress designated the United States Army Corps of Engineers (USACE) as the lead federal agency for implementing the Formerly Utilized Sites Remedial Action Program (FUSRAP) subject to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, and the National Oil and Hazardous Substances Contingency Plan. Niagara Falls Storage Site (NFSS) Vicinity Property H Prime (VP H') is a designated FUSRAP site located in the Town of Porter, Niagara County, New York (Figure 1). As the lead federal agency for FUSRAP, USACE has authority to address the following:

- Radioactive contamination (hazardous substance) from Manhattan Engineer District (MED)/Atomic Energy Commission (AEC) activities, or
- Other hazardous substances, pollutants, or contamination resulting from MED/AEC activities, or
- Hazardous substances, pollutants or contamination unrelated to MED/AEC activities, but which are commingled with MED/AEC waste.

A review of historical records found no evidence to indicate that MED/AEC activities involved the use, storage, or disposal of other hazardous substances, pollutants, or contamination (i.e., chemical or non-radiological) at VP H'. Consequently, the USACE determined it appropriate to focus the remedial investigation on FUSRAP-eligible radioactive contaminants only. FUSRAP-eligible contaminants are primarily the result of uranium ore processing, such as isotopes of uranium, thorium, and radium. Remediation of radioactive contaminants from other activities, such as those related to the Knolls Atomic Power Laboratory (KAPL), which include cesium, strontium, and plutonium, are the responsibility of the United States Department of Energy (USDOE) Office of Environmental Management.

1.2 Purpose of the Remedial Investigation

USACE conducted this remedial investigation to delineate the nature and extent of FUSRAP-eligible radionuclides, evaluate their potential risk to human health and the environment, and determine whether a remedial action is warranted.

USACE initiated the VP H' CERCLA process in 2016 with the completion of a preliminary assessment (USACE 2016a). The preliminary assessment included a comprehensive records review to obtain information on historic site operations that may have contributed to potential contamination, as well as previous investigations and remedial actions that have taken place at the site. The preliminary assessment concluded that the site posed no imminent threat to human health or the environment but historical activities, such as the storage and incineration of FUSRAP-related material, may have adversely impacted soil, concrete slabs/foundations, and other site media. The preliminary assessment recommended further investigation, in accordance with CERCLA, to determine the nature and extent of AEC-related contamination and the associated risks to human health and the environment.

1.3 Remedial Investigation Objectives

The objectives established for the remedial investigation are to collect data of acceptable quality and quantity to:

- Identify the nature and extent of radioactive contaminants in soil and water for remedial planning (feasibility study).
- Develop a groundwater contaminant fate and transport model, if required.
- Prepare a baseline human health and ecological risk assessment.
- Characterize investigation-derived waste (IDW) for purposes of disposal.
- If necessary, support requirements of a future final status survey for site closure in accordance with Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM).

1.4 Report Organization

This remedial investigation report has been prepared in accordance with CERCLA, using the United States Environmental Protection Agency (USEPA) Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA (USEPA 1988).

This remedial investigation report is organized as follows:

- Section 1.0 includes the purpose and objectives of this remedial investigation, as well as a summary of historical site operations and previous investigations and remedial activities
- Section 2.0 presents information regarding the physical setting of the site, remedial investigation scope of work, and conceptual site model
- Section 3.0 provides details of remedial investigation field activities
- Section 4.0 describes the nature and extent of contamination
- Section 5.0 discusses the fate and transport of contaminants in environmental media
- Section 6.0 presents the results of the baseline human health risk and ecological screening level risk assessments
- Section 7.0 presents the remedial investigation summary, conclusions, and recommendations
- Section 8.0 includes a list of references

1.5 Site Description and Zoning

VP H' occupies an area of approximately 1.6 hectares (4 acres) and is rectangular in shape, approximately 180 meters (m) by 90 m [600 feet (ft) by 300 ft]. It is situated north of the NFSS, south of Balmer Road, and west of Porter Center in the Town of Porter, Niagara County, New York, and is bound on three sides by on-site roads, including Wesson Road on the west, M Street on the south, and 5th Street on the east. The northern boundary is an out-of-service railroad track. VP H' is currently owned by CWM Chemical Services LLC (CWM). CWM restricts access to the site. The site location map is shown on Figure 1.

In April 1972, the New York State Commissioner of Health imposed land-use restrictions on the property with the objective of protecting public health and safety and to "minimize danger to life and property from radiation hazards." The restrictions indicate that the property cannot be used for residential purposes, schools, or hospitals, but it can be used for industrial or commercial activities. If the New York State Department of Health deemed it appropriate, these restrictions could be lifted (Wallow 1980).

The Town of Porter zoning indicates that VP H' is situated in the M-2 General Industrial Zone, which allows for heavier manufacturing and processing facilities as well as offices, research, and service establishments. Prohibited uses include residences; those that may be injurious or noxious due to production or emission of dust, smoke, refuse matter, odor, gas, fumes, noise, vibration, or toxic substances or conditions; and, processing, storage or disposal of hazardous or other wastes.

1.6 Site History

1.6.1 Site Operational History

VP H' is located within the original boundary of the former Lake Ontario Ordnance Works (LOOW), a 3,035-hectare (7,500-acre) Defense Environmental Restoration Program, Formerly Used Defense Site. The former LOOW was built for the purpose of manufacturing trinitrotoluene (TNT) during World War II. The TNT production, production support, and storage areas were constructed on approximately 1,012 hectares (2,500 acres), which included VP H'. The remaining 2,023 hectares (5,000 acres), located to the west of the production area, were left undeveloped. The TNT plant was decommissioned in July 1943 due to excess production at other TNT plants after only nine months of operation.

Beginning in 1944, the MED and its successor, the AEC, used portions of the LOOW, including NFSS, VP H', and other surrounding vicinity properties, for storage and incineration of radioactive wastes. These wastes were primarily residues from uranium ore processing operations; however, they also included contaminated rubble and scrap from decommissioning activities, biological and miscellaneous wastes from the University of Rochester, and low-level fission-product waste from contaminated-liquid evaporators at KAPL. The LOOW discontinued receipt of radioactive waste in 1954, and after the Hooker Chemical Company conducted cleanup activities, 525 hectares (1,297 acres) of the original 612-hectare (1,512-acre) LOOW became surplus. The General Services Administration eventually sold the vicinity properties to various private, commercial, and governmental agencies.

1.6.2 Previous Investigations and Remedial Activities

Between 1970 and 1986, the USDOE and its predecessor agency, the AEC, and their contractors performed radiation surveys and collected soil, water, and sediment samples at VP H'. Based on the results of these activities, a total of approximately 3,500 cubic meters (m^3) [4,600 cubic yards (yd^3)] of soil in the southeastern portion of the site was excavated. These previous investigations and associated remedial work provided the basis for the design of this remedial investigation of VP H'. Additional details are provided in chronological order in the following sections.

1.6.2.1 1973 Investigation and Remedial Activity

The AEC documented radiation survey data for several vicinity properties, including VP H', in a report entitled *Radiation Survey and Decontamination Report of the Lake Ontario Ordnance Works Site* (AEC 1973). At VP H', gamma readings were collected on a grid-based sampling scheme, spaced 6 m (20 ft) apart where contamination was suspected and 15 m (50 ft) apart elsewhere, as shown on the Figure 2.

Based on the results of this survey, an area approximately 3,200 square meters (m^2) (35,000 square feet (ft^2)), 0.3 to 0.9 m (1 to 3 ft) deep, was excavated (Figure 3). According to the 1973 report, the excavated area was not backfilled.

1.6.2.2 1983/1984 Investigation and Remedial Activities

In a report entitled *Comprehensive Radiological Survey, Off-Site Property H', Niagara Falls Storage Site, Lewiston, New York,* released in June 1983, the USDOE presented the results of soil and groundwater sampling (USDOE 1983). In June and July 1982, approximately 40 surface soil samples were collected at grid intersections spaced at 20-meter square (66-foot square) intervals.

Another 21 surface soil samples were collected at reported "hot spot" locations based on the results of a radiation survey, and 28 boreholes were advanced for the collection of subsurface and groundwater samples. Three water and two sediment (saturated soil) samples were collected from on-site ditches (i.e., low-lying areas). Sample locations are shown on Figure 4.

Soil and sediment samples were analyzed for several radionuclides, predominantly radium, cesium, uranium, and thorium; a few samples also were analyzed for plutonium and strontium.

The USDOE reported that the analytical results of surface and subsurface soil samples for cesium, strontium, and plutonium were below established USDOE guidelines. However, elevated concentrations of radium-226 and uranium-238 were detected. It was estimated that approximately 1,500 m^3 (2,000 yd^3) of soil required remediation.

Groundwater samples were collected from the boreholes and analyzed for gross alpha and beta concentrations, as well as radium-226 (for samples with elevated gross activity). It was noted in the 1983 report that the water samples obtained from boreholes may have been adversely affected by the presence of solids in the samples. The maximum levels of gross alpha and gross beta concentrations were 799 picocuries per liter (pCi/L) and 363 pCi/L, respectively, measured in Sample W13 from borehole H8 (this area was included in the remedial excavations). None of the samples analyzed for radium-226 contained levels exceeding 3 pCi/L, the USEPA drinking water criteria at the time of the survey[1].

In 1984, the USDOE excavated soil from VP H' based on the findings of the 1983 characterization effort. To verify that the remaining soil complied with regulatory guidelines, the USDOE performed a near-surface radiological scan over the entire excavated area, collected soil samples at 6-m (20-ft) intervals, and measured gamma counts at each grid intersection. Details of the confirmation sampling performed at VP H' are presented in USDOE's 1986 report entitled, *Post-Remedial Action Report for the Niagara Falls Storage Site Vicinity Properties – 1983 and 1984* (USDOE 1986).

The regulatory guidelines selected by the USDOE in 1984 included but were not limited to the following:

- 5 picocuries per gram (pCi/g) of radium-226 (not including background) in the top 15 centimeter (cm) [6-inch (in)] of soil averaged over an area of 100 m^2 (120 yd^2)
- 15 pCi/g of radium-226 (not including background) in each 15-cm (6-in) thick layer of soil below the surface averaged over an area of 100 m^2 (120 yd^2)
- 75 pCi/g of total uranium
- A "hot spot" allowance for radium-226 based on the equation $\sqrt{(100/A)}$ multiplied by the regulatory limit, where "A" equals the assumed area of the hot spot

Confirmation sampling results showed that among the 336 samples collected for radium-226 analysis:

- Five soil samples exceeded 15 pCi/g, but nearby concentrations indicated when background was subtracted from the average results, the average met the remediation guideline

[1] The combined radium-226/radium-228 maximum contaminant level for safe drinking water in community water systems as promulgated by the USEPA is 5 pCi/L in both the original 1976 Radionuclides Rule and the updated 2000 Final Rule, however the 1976 Rule (current during the USDOE investigations) linked suspected isotopic radium such that radium-228 would be assumed to be less than 2 pCi/L and the overall standard would be met if the measured radium-226 concentration was less than 3 pCi/L. The current Rule considers individual radium-226 and -228 measurements for the combined compliance demonstration.

- The highest result was 58.8 pCi/g, which met the remediation guideline using the "hot spot" rule (i.e., based on the equation √(100/A) multiplied by the regulatory limit, where "A" equals the assumed area of the hot spot)
- The average concentration was 0.9 pCi/g above background

Once it was determined that the guidelines were met, the remediated area was backfilled with clean fill. The excavated area and the post-remedial sample locations are shown on Figure 5.

1.6.2.3 1986 Verification Survey

As a quality assurance measure, USDOE protocol required that a third party independently evaluate the radiological conditions of a remediated area to verify that guidelines had been adhered to and radionuclide levels did not exceed limits. For FUSRAP, USDOE retained Oak Ridge Associated Universities (ORAU) as the independent verification contractor.

In 1986, ORAU performed a verification survey over VP H' and reported their findings in a report issued in 1989 (ORAU 1989). Sample locations are shown on Figure 6. Work included visual inspections, gamma scans, and surface and subsurface soil sampling. Results identified three isolated areas of concern:

- One area contained a small "chip" that was determined to be the source of the elevated readings (the chip was removed);
- Another area was identified as slag and left in place; and,
- A third area located along M Street consisted of black cinder material (220 pCi/g of radium-226 and 37 pCi/g of uranium-238) that was excavated; the area was re-sampled and determined to be compliant. The area that contained black cinder is shown on Figure 5.

Follow-up sampling showed remaining concentrations of select radionuclides within regulatory guidelines at VP H'.

1.6.2.4 2004 USACE Activity

In 2000, USACE built a contaminated material storage area (CMSA) pad to temporarily store contaminated materials generated during the removal of TNT pipelines at LOOW under the Defense Environmental Restoration Program for Formerly Used Defense Sites. It covered an approximately 16-m (175-ft) square area in the southeastern corner of VP H'. The pad was constructed using a stone base 15 cm (6 in) thick covered with a geotextile followed by a 40 millimeter- (1.6 in-) thick high density polyethylene liner, another geotextile layer, and 30 to 46 cm (12 to 18 in) of stone (USACE 2004). It was surrounded by 143 concrete barriers.

In 2004, following completion of the TNT pipeline removal project, USACE determined that the CMSA pad was no longer needed. A contractor removed the barriers, stones, and geotextile; performed a visual survey of the pad area; and collected six discrete soil samples (SP-1 through SP-6). Following the visual survey, a qualitative gamma walkover survey was performed for health and safety purposes within the former pad area. This survey identified gamma activity at levels up to eight times higher than background. Two "hot spot" samples (SP-7 and SP-8) were collected from areas with elevated gamma readings. Approximate sample locations (i.e., the locations were not surveyed) are shown on Figure 7.

Noteworthy among the samples collected was "hot spot" sample SP-7 which exhibited radium-226 and uranium-238 concentrations of 836 pCi/g and 88.2 pCi/g, respectively. Sample SP-8 also exhibited a slightly elevated radium-226 concentration of 16 pCi/g (note that results were

interpolated based on the lab results of other radionuclides in that sample). The analytical results for the soil samples collected during the CMSA pad removal based on visual inspections are provided on Table 1-1 (SP-1 through SP-6) and based on biased gamma measurements (SP-7 and SP-8) on Table 1-2.

After the original CMSA pad materials were removed, the pad area was covered with a new geotextile liner, approximately 15 cm (6 in) of clean backfill, and re-seeded. The extent of the geotextile liner was not documented, so it is not known whether it extends over entire former CMSA pad or is limited to the area that exhibited elevated gamma readings.

2 PROJECT DESCRIPTION

2.1 Site Features

2.1.1 Site Physiography

The site and surrounding area are generally flat with an average elevation of approximately 96 m (315 ft) above mean sea level. Most of the site is overgrown with pasture grass and northern shrub, and maple, ash, and oak trees dominate the wooded areas.

There are several low-lying areas of the site that are poorly drained and allow for standing water during periods of heavy precipitation. Phragmites are dominant within these areas.

2.1.2 Regional Geology

The vicinity property and surrounding region are within the Ontario Lake Plain and are generally flat to gently rolling. The Niagara Escarpment sits just over 5 kilometers (2 miles) to the south and is the result of a division in bedrock stratigraphy in the region. North of the escarpment, where VP H' is located, erosion wore away the upper 300 m (1,000 ft) of Silurian deposits, leaving the Queenston Formation as the uppermost bedrock layer. The Queenston Formation, composed of shale, siltstone, and sandstone is approximately 300 m (1,000 ft) thick and overlies thick layers of Ordovician shale and limestone units (Acres American, Inc. 1981; Bechtel National, Inc. 1994; USACE 2007).

The surficial soil and fill at VP H' is made up of unconsolidated materials that have been altered or deposited by human activities, such as site grading. Sand and gravel also are generally found in this unit. The thickness of this unit varies between 0 and 1.5 m (0 and 5 ft), with an average depth of 0.5 m (1.6 ft). Generally, the unit is dry to moist, although commonly saturated late winter through spring.

Since the borings advanced for the VP H' remedial investigation did not exceed a depth of 1.5 m (5 ft), geologic details below this depth are based on data collected from surrounding vicinity properties as part of USACE's 2002 LOOW investigation and presented in *Results for the Phase II Remedial Investigation at the Former Lake Ontario Ordnance Works (LOOW) Niagara County, New York* (USACE 2002a).

The former LOOW is underlain by 9 to 18 m (30 to 60 ft) of unconsolidated glacial deposits that unconformably overlay the shale bedrock of the Queenston Formation. A generalized stratigraphic cross section of the former LOOW is shown in Figure 8. The stratigraphic sequence in descending order is:

- Recent alluvium/fill - Alluvium/fill material is found discontinuously across the LOOW due to extensive regrading. This unit is typically characterized as a silt but may have subordinate sand and/or clay facies.
- Upper glacial till sequence (upper clay till and upper silt till) - The upper clay till is brown to reddish brown, typically very hard, and commonly found between 0.2 and 0.6 m (0.5 and 2 ft) below ground surface. The upper silt till, occasionally encountered just below the upper clay till, is typically moderately firm and may have subordinate water-bearing fine sand lenses.
- Middle silt till - This unit divides the upper and lower glaciolacustrine clay units. The

middle silt till is usually characterized as a dense silt and/or sand and is present only in western and northwestern portions of the LOOW (i.e., not present at VP H').

- Glaciolacustrine clay – This unit is usually found underlying the upper clay till (or upper silt till, if present). The contact between the upper tills and the glaciolacustrine clay is typically characterized by a sharp change from the hard, dense matrix of the upper tills to a noticeably softer, brownish-gray to pale gray clay.
- Glaciolacustrine silt/sand - This stratum is found underlying the glaciolacustrine clay and is the most permeable geological unit below the site. It is generally characterized as a fine to coarse silty sand, and it forms the uppermost aquifer beneath the former LOOW.
- Basal red till – This unit is derived from the underlying shale bedrock and is characterized as a dense, silty glacial till. The basal red till forms a nearly continuous veneer over the shale at the former LOOW.
- Bedrock (Queenston Formation) - The regional bedrock geology beneath the former LOOW consists of a reddish-brown fissile shale.

2.1.3 Regional Hydrogeology

Within 30.5 m (100 ft) of the ground surface, there are two water-bearing zones: the upper water-bearing zone (UWBZ) is near the surface brown clay unit and the lower water-bearing zone (LWBZ) is associated with the Queenston Formation and the unconsolidated materials immediately above the bedrock (red silt and sand and gravel units). The glaciolacustrine clay unit acts as an aquitard between the UWBZ and LWBZ. Groundwater in the UWBZ occurs at approximately 1 to 3 m (3.2 to 9.8 ft) below ground surface and exhibits a water-table surface that generally conforms to the local topography.

Regional groundwater flow is primarily to the northwest toward the Niagara River, although creeks and drainage ditches influence localized groundwater flow patterns.

There is currently one groundwater monitoring well, C1-2-BP1, installed on VP H'. Depth to groundwater was measured at 1.1 m (3.7 ft) below grade during well development activities on November 27, 2018.

2.1.4 Groundwater Usage

For several decades, almost all Niagara County residents have used a public water supply from the upper Niagara River. In 2005, the Niagara County Department of Health (NCDOH) conducted a private water well survey in the Towns of Lewiston and Porter, New York (NCDOH 2006). The purpose of the survey was to identify the water quality of active wells in the vicinity of the LOOW property. This included portions of Niagara County north of Route 104 and west of Ransomville Road (excluding the Village of Lewiston). The county distributed questionnaires to 219 residents it believed had private wells within the project area; only 159 residents returned surveys. Based on the information provided, there were 117 private wells. Among these 117 wells:

- 11 wells are actively used as a source of drinking water
- Eight wells are used for other non-potable activities
- 20 wells are abandoned, and
- 78 wells are not in use

Figure 9 shows the population and drinking wells located within ¼ mile, ½ mile, 1 mile, 2 miles, 3 miles, and 4 miles from VP H'.

2.1.5 Regional Meteorology

VP H' is located in western New York, which has a humid, continental climate characterized by warm summers and cold winters. The mean annual temperature is 8.8 degrees Celsius (°C) (48 degrees Fahrenheit [°F]) with mean seasonal temperatures ranging between –3.9°C and 24.4°C (25°F and 76°F). Mean annual precipitation is approximately 74 cm (29 in), distributed evenly throughout the year. Snowfall, predominantly falling between November and March, averages approximately 130 cm (51 in) per year. Wind data for the region shows predominantly southwest winds with average monthly wind speeds ranging from 16.1 to 22.5 kilometers per hour (10 to 14 miles per hour).

2.1.6 Surrounding Land Use

There are approximately 380 private residences within the original 3,035-hectare (7,500-acre) land parcel of the former LOOW. Most are along Creek Road, the western section of Cain Road, Balmer Road, and Pletcher Road. The largest residential area is along Balmer Road and includes the Youngstown Mobile Home Park consisting of approximately 92 units on Balmer Road, west of the former LOOW. The Lewiston-Porter Central School District property is approximately 2.4 kilometers (1.5 miles) to the west and Modern Landfill is located within 1 kilometer (0.6 miles) to the southwest of VP H'. A 5.3-hectare (13-acre) Kampground of America (KOA) opens seasonally April through mid-October on the south side of Pletcher Road. The Our Lady of Fatima Shrine, attracting thousands of visitors each year, is on the north side of Swann Road. There are also several small farms in the area. Figure 10 shows the surrounding areas and their land uses.

2.2 Remedial Investigation Scope of Work

The information gathered as part of the preliminary assessment guided the development of the scope of work for remedial investigation field activities. The main elements of the remedial investigation field work included:

- Site-wide gamma walkover survey
- Advancement of soil borings and collection and laboratory analysis of soil samples
- Collection and laboratory analysis of concrete pad samples
- Development of existing wells and collection and laboratory analysis of groundwater samples
- Collection and laboratory analysis of water samples from ponded water in low-lying areas
- Civil survey of all sample locations

2.3 Conceptual Site Model

A conceptual site model (CSM) was developed to present potential contaminant sources and receptors and the interactions that link them together. The elements of the CSM are:

- Contamination mechanism (i.e., the origin of contamination);
- Source media (i.e., contaminant source);
- Potential transportation mechanisms (e.g., leaching, airborne, etc.);
- Exposure media (e.g., surface soil, biota, etc.);
- Exposure routes (e.g., inhalation, ingestion, etc.); and
- Potential receptors (e.g., industrial worker, construction worker, etc.).

The CSM is presented in Figure 11 and details are presented below.

2.3.1 Identification of Contamination Mechanism, Source Media, and Transport Mechanisms

The likely contamination mechanisms at VP H' are spills and releases related to past waste storage, as well as waste incineration activities that reportedly took place on the concrete pad that still remains at the site. These spills/releases have impacted surface and/or subsurface soils.

2.3.2 Identification of Exposure Media, Pathways, and Receptors

Given the current land use restrictions, general industrial zoning of the site, lack of development pressure in the area, and the nature of surrounding land use (e.g., hazardous waste landfill to the east and sanitary landfill to the southeast), it is reasonable to assume that future land use will continue to be industrial.

The CSM identifies potential pathways for human exposure to radionuclides at the site. Since the current and anticipated future land use of the site is industrial, potential receptors are limited to industrial, commercial, and construction workers, as well as trespassers.

2.3.2.1 Soil

Potential soil exposure routes were identified as inhalation of fugitive dust, incidental ingestion, dermal contact with impacted surface or subsurface soils, and external radiation.

Although dermal contact is possible, exposure is considered an unquantifiable exposure pathway due to the lack of dermal cancer slope factors for radionuclides and the low frequency at which current and future workers and trespassers would have direct contact with soils.

Inhalation of fugitive dust and incidental ingestion of soils are evaluated in the risk assessment but are considered minor exposure pathways for current and future workers and trespassers.

The external radiation pathway is considered the primary exposure route due to the nature of the gamma-emitting radionuclides evaluated, particularly radium-226. All receptors are externally exposed to contaminated surface and subsurface soils. The relative influence varies over time with assumed erosion of the surface layers.

2.3.2.2 Groundwater

The exposure pathway identified for groundwater is limited to incidental ingestion by a construction worker. Groundwater at the site is not currently or potentially a drinking water source due to its salinity. The New York State Department of Environmental Conservation defines saline groundwater as having a chloride concentration of more than 250 milligrams per liter (mg/L) or a total dissolved solids concentration of more than 1,000 mg/L. Based on data collected on December 11, 2018, the total dissolved solids concentration in on-site well C1-2-BP1was 1,070 mg/L. To be a potable water source, groundwater at the site would require expensive and energy intensive treatment and given the replaceable surface water source via the Niagara River/Lake Ontario and groundwater south of the site (Lockport Formation), it is reasonable to assume that no municipality or service would find groundwater at the site economically viable.

2.3.2.3 Ponded Water

The site has several areas of ponded water caused by precipitation accumulating in poorly drained low-lying areas. Since these ponded areas are not permanent and vary in area and depth season to season, year to year, exposure pathways are minor.

3 REMEDIAL INVESTIGATION ACTIVITIES

Remedial investigation field activities were performed by ARS Aleut Remediation, LLC (AAR) between October 2018 and January 2019 in accordance with USACE's *Scope of Work Remedial Investigation of Vicinity Property H Prime* (USACE 2018). Details are provided in the following sections.

3.1 Site Clearing

Site clearing activities were performed between October 18, 2018, and November 1, 2018, using a Takeuchi TL18 compact track loader. Excessive vegetation, overburden, brush, and small trees were removed to allow access for surveying and drilling. All tree limbs, vegetation, and other cleared materials were staged on property adjacent to VP H', as directed by USACE and CWM.

Following clearing and grubbing, a New York State-licensed surveyor performed a civil survey to establish baseline elevations, property boundary limits, and pre-determined boring locations. In addition, a geophysical survey was conducted within a 4.6-m (15-ft) radius around each proposed boring location to locate utilities.

3.2 Gamma Walkover Survey

Following site clearing work, AAR performed a gamma walkover survey of open areas of the site between November 5, 2018, and November 15, 2018. Several small areas were not surveyed due to ponded water or items (e.g., large concrete pipe sections) that could not be easily moved. An additional gamma walkover survey was performed between January 16, 2019, and January 17, 2019, over previously inaccessible portions of the site under ponded water. This data was merged with that from the initial survey.

Layout lines established by a civil survey guided the gamma survey, which was performed with a Ludlum 2221 detector equipped with a 4.1-cm by 4.1-cm (2-in by 2-in) thallium-doped, sodium iodide (Model 44-10 NaI) scintillation probe. This probe provides good sensitivity to gamma rays emitted by radium-226, uranium-235, and uranium-238 daughters (i.e., protactinium-234m and thorium-234). The survey method consisted of a single pass with the detector swinging in a 1 m- (39 in-) wide serpentine pattern approximately 10 cm (4 in) above the ground surface. The surveyor advanced at a rate of no more than 0.5 m per second (1.6 ft per second). The count rate data was transmitted to a data logger at one second intervals. Survey locations were recorded using a Trimble global positioning system (GPS).

3.3 Soil

Previous remedial (excavation) activities at the site generated an abundance of soil confirmation data, so the remedial investigation soil characterization effort was designed to satisfy two requirements: identify soil contamination and provide data suitable for use in a final status survey if contamination was not present.

The site was divided into MARSSIM Class 1 and Class 2 survey units[2]. The area outside the previously excavated areas, i.e., the area that was determined by the USDOE to be clean, was approximately 10,000 m^2 (12,000 yd^2) and designated a Class 2 survey unit. The areas that were

[2]According to MARSSIM, a Class 1 area has the highest potential for contamination while a Class 2 area has a low potential for contamination.

previously excavated were divided into four Class 1 survey units, each approximately 2,000 m^2 (2,400 yd^2). The Class 1 areas were designated C1S1, C1S2, C1S3 and C1S4 and the single Class 2 area was designated C2.

A total of 89 borings were advanced to a depth of 1.5 m (5 ft) below grade using a track-mounted AMS 9520 VTR Power Probe direct-push rig. One and a half meter- (5-foot) long soil cores were recovered from each borehole via a sample barrel containing a 7-cm (2.75-in) disposable liner. Drilling equipment was decontaminated between boreholes and any waste generated from drilling (excess soil) and decontaminating sampling and drilling equipment was containerized and stored on site for disposal. Boreholes were backfilled with grout (bentonite).

A minimum of 14 borings were advanced in each survey unit, with additional borings located in a couple of the units due to their irregular shapes, as follows:

- 14 borings in C1S1
- 14 borings in C1S2
- 16 borings in C1S3
- 14 borings in C1S4
- 17 borings in C2
- 2 borings on the concrete pad (CP-1 and CP-2) in the southeast corner of the property
- 12 hotspots (Hotspot 01 through Hotspot 12) identified by the gamma walkover survey

Ten of the pre-determined sample locations were adjusted in the field due to the presence of underground utilities and large unwieldy items. In addition, several of the pre-determined soil borings were located in the low-lying ponded areas, which contained water several feet deep at the time of the remedial investigation field work. To allow access for the drill rig, the ponded water was pumped to frac tanks for storage prior to sampling and ultimate discharge. Additional details are provided in Section 3.5.2. Actual boring locations are shown on Figure 12. Boring logs are included in Appendix A.

AAR scanned each soil boring core for volatile organic compounds (VOCs) using a Mini RAE photoionization detector. Soil cores were scanned for radiation using direct-read radiological detectors, including a Ludlum Model 2360 meter with either a Model 43-89 or 43-93 detector for alpha/beta emissions and a Ludlum Model 2221 meter with a 4.1 cm by 4.1 cm (2-in by 2-in) Model 44-10 NaI scintillation detector for gamma emissions. AAR first passed the cores through a polyvinyl chloride (PVC) tube with the NaI detector mounted perpendicular to the tube, and the entire setup was shielded with a lead blanket to minimize background radiation. The cores were then cut open and directly scanned for alpha/beta emissions. The detectors were subject to daily quality control performance checks.

Three soil samples were collected for laboratory analysis from each soil core, as follows: the first two intervals, 0 to 0.15 m (6 in) and 0.15 to 0.46 m (6 to 18 in); and the 0.3-m (one-ft) interval below 0.46 m (18 in) that exhibited the highest radiological scan measurements, or if there were no elevated measurements below 0.46 m (18 in), the interval immediately below 0.46 m (18 in), i.e., 0.46 to 0.76 m (18 to 30 in). With the exception of the following four locations, the deepest soil samples were collected from 0.46 to 0.76 m (18 to 30 in) below grade:

- C1S2-02, 1.2 to 1.5 m (48 to 60 in) below grade
- C1S3-01, 0.6 to 0.9 m (24 to 36 in) below grade
- C2-07, 1.1 to 1.4 m (42 to 54 in) below grade
- C2-11, 0.8 to 1.1 m (30 to 42 in) below grade

Two concrete samples were collected from 0 to 0.15 m (6 in) and 0.15 to 0.46 m (6 to 18 in) at location CP-1 and one concrete sample was collected from 0 to 0.15 m (6 in) at location CP-2. Both CP-1 and CP-2 are located on the concrete pad situated in the southeast corner of the site. Following collection of the concrete samples, soil borings CP-1 and CP-2 were advanced below the concrete and soil samples were collected from intervals 0 to 0.15 m (6 in), 0.15 to 0.46 m (6 to 18 in), and 0.46 to 0.76 m (18 to 30 in) below grade.

Each soil and concrete sample was analyzed for the parameters and by the methods shown in Table 3-1 below. The KAPL constituents, isotopic plutonium, cesium-137, and strontium-90, were analyzed for disposal purposes only.

Table 3-1
Soil and Concrete Pad Sample Analysis Schedule

PARAMETER	ANALYTICAL METHOD
Radium-226 and radium-228	USEPA 901.1, Gamma spectroscopy
Isotopic thorium	USDOE EML HASL-300m, Alpha spectroscopy
Isotopic uranium	USDOE EML HASL-300m, Alpha spectroscopy
Isotopic plutonium	USDOE EML HASL-300m or laboratory-accredited method, Alpha spectroscopy
Cesium-137	USEPA 901.1 or laboratory-accredited method, Gamma spectroscopy
Strontium-90	USEPA 905 or laboratory-accredited method, Gas Proportional Counting

For quality control purposes, field duplicate samples were collected at a frequency of 10% of the total number of samples collected.

3.4 Groundwater

On November 27, 2018, AAR developed existing monitoring well C1-2-MW-BP1 located on VP H' and two existing monitoring wells, C1-20-BP3 and C1-2-A100BP4, located on the property immediately north and downgradient of VP H' (Figure 13). All three wells were developed by pumping and/or bailing until groundwater parameters (pH, specific conductance, temperature, turbidity, and dissolved oxygen) stabilized (i.e., three consecutive readings within 10 percent) or 55 gallons of groundwater have been removed. Development water was contained and transferred to the IDW storage area for subsequent disposal. Well development logs are provided in Appendix B.

AAR allowed at least 72 hours following development to collect groundwater samples. On December 11, 2018, AAR collected a groundwater sample from each well using a low-flow sampling technique. Groundwater samples were analyzed for water quality parameters pH, temperature, dissolved oxygen, oxidation-reduction potential (redox), specific conductivity, and turbidity. In addition, both filtered and unfiltered groundwater samples were submitted to the laboratory for analysis for the parameters listed in Table 3-2 below. The KAPL constituents, isotopic plutonium, cesium-137, and strontium-90, were analyzed for disposal purposes only.

Table 3-2
Water Sample Analysis Schedule

PARAMETER	FILTERED[1]/UNFILTERED	METHOD
Isotopic Uranium	1 filtered, 1 unfiltered	USDOE EML HASL-300m, Alpha-Spectroscopy
Radium- 226	1 filtered, 1 unfiltered	USEPA 903.1, Radon Emanation
Radium-228	1 filtered, 1 unfiltered	USEPA 904.0, Gas Proportional Counting
Isotopic Thorium	1 filtered, 1 unfiltered	USDOE EML HASL-300m, Alpha-Spectroscopy
Isotopic Plutonium	1 filtered, 1 unfiltered	Alpha spectroscopy: USDOE EML HASL-300m or laboratory-accredited method
Cesium-137	1 filtered, 1 unfiltered	Gamma spectroscopy: USEPA 901.1 or laboratory-accredited method
Strontium-90	1 filtered, 1 unfiltered	Gas Proportional Counting: USEPA 905 or laboratory-accredited method
Anions	1 unfiltered	USEPA 300.0 or SW846 9056 Ion Chromatography
Total Dissolved Solids	1 unfiltered	Standard Methods 2540C or USEPA 160.1
Alkalinity	1 unfiltered	Standard Methods 2320B or USEPA 310.1

- Water samples were filtered via disposable 0.45 micron in-line field filters

3.5 Ponded Water

During periods of heavy precipitation, water accumulates in low-lying areas of the vicinity property and due to the low permeability of the soil, drains slowly into the subsurface and/or evaporates depending on weather conditions. During the remedial investigation field work that was initiated in late fall 2018 and continued through early winter 2019, water accumulated in the three areas shown on Figure 13.

3.5.1 Sample Collection

Between November 29, 2018, and December 3, 2018, AAR collected 16 water samples, one filtered and one unfiltered from eight locations in low-lying areas of the site shown on Figure 13. Sample collection logs are provided in Appendix C. Three water samples, C1S1-10, C1S2-07, and C2-11A, were collected at the corresponding borehole location (note that water sample C2-11A corresponds to borehole C2-11). The remaining samples were collected as near as possible to the corresponding borehole locations:

- Sample C1S2-03 offset approximately 3 m (10 ft) west of borehole C1S2-03
- Sample C2-08 offset approximately 9.1 m (30 ft) southwest of borehole C2-08
- Sample C2-10 offset approximately 3 m (10 ft) east of borehole C2-10
- C1S1-04 offset approximately 1.5 m (5 ft) east of borehole C1S1-04
- C1S2-11 offset approximately 3.7 m (12 ft) east of borehole C1S2-11

To collect the samples, AAR used a peristaltic pump equipped with polyethylene tubing placed below the water line to minimize the disturbance of organic materials in the low-lying areas. The

tubing was replaced between sample locations to prevent cross-contamination. Filtered samples were also collected after attaching an in-line, disposable 0.45-micron particle filter to the pump discharge tubing and flushing the system with approximately 100 to 300 milliliters (3.4 to 10.1 ounces) of groundwater. The water samples were analyzed for the parameters listed in Table 3-2.

3.5.2 Frac Tanks

On December 17, 2018, three 76,000-liter (20,000-gallon) frac tanks were mobilized to VP H' to store water pumped from two main low-lying areas. Several soil borings at pre-determined grid locations were situated within these low-lying areas and the water was too deep to allow safe access for the drill rig.

On January 11, 2019, water stored in the frac tanks, as well as additional water remaining in the low-lying areas, was pumped to CWM retention ponds for ultimate discharge through a permitted New York State Pollution Discharge Elimination System discharge location Prior to discharge, all ponded water data was evaluated for compliance with the limits shown in Title 6 New York Code of Rules and Regulations Part 380-11.7 Table II Column 2. The New York State Department of Environmental Conservation provided written guidance for this discharge.

3.6 Investigation-Derived Waste

All IDW, including drilling spoils, wastewater, decontamination liquids, personal protective equipment, and miscellaneous solid waste were containerized in 55-gallon drums prior to sampling and disposal.

Five drums filled with soil (labeled Drum #1, #2, #3, #4, and #6) were sampled for VOCs and metals using USEPA analytical methods SW846 8260C and SW846 6010C/6020/7471A, respectively. One drum (Drum #5) was filled primarily with plastic and was not sampled.

In addition to sampling the drums, soil samples were analyzed for KAPL constituents for the purpose of disposal only. KAPL constituents include isotopic plutonium, cesium-137, and strontium-90 analyzed by methods HASL 300m, USEPA 901.1, and USEPA 905.0, respectively.

One drum contained wastewater from decontamination activities and development and purging of three wells. The wastewater was analyzed for the following parameters (method in parentheses): VOCs (SW846 8260C), metals (SW846 6010C/6020/7470A), pH (A4500B), total suspended solids (A2540D), total dissolved solids (A2540C), total cyanide (E335.4), biological oxygen demand (A5210D), and phosphorus (E365.1). The wastewater was also analyzed for KAPL constituents, as follows: isotopic plutonium (USDOE EML HASL-300m), cesium-137 (USEPA 901.1) and strontium-90 (USEPA 905).

4 NATURE AND EXTENT OF SITE-RELATED CONSTITUENTS

Analytical and physical site data collected during this remedial investigation are evaluated so that informed decisions can be made regarding risk and appropriate remedial actions, if required. Details of the findings of soil, groundwater, and ponded water analytical data, as well as the gamma walkover survey, are presented in the following sections.

4.1 Gamma Walkover Survey

The results of the gamma walkover survey were used to identify the locations of 12 biased soil borings (Hotspot 01 through Hotspot 12). The source of some elevated gamma readings was observed to be slag, predominantly along roads and the former railroad tracks. Historically, slag was used as bedding material, and AAR identified numerous elevated gamma locations along the former railroad tracks.

Bedding material along "M" Street and Wesson Road exhibited elevated gamma results likely indicative of slag. The road that enters the site from "M" Street also contained slag, and several of the borings sited along the road (C1S1-06, C1S1-10, C1S1-12, and C1S1-14) required soil be collected by hand adjacent to these locations to acquire sufficient volume for laboratory analysis.

The bermed area located between the two main low-lying areas on the property also exhibited elevated gamma results. Historically, this area was covered by railroad tracks that crossed the site in an east-west direction, as seen on the 1951 aerial photo (Figure 14). Another set of tracks runs east-west along the northern boundary and remains but is no longer in service. These two sets of railroad tracks likely account for the large amount of slag observed at the site: among the 89 borings advanced at VP H', 32 or approximately 36 percent were observed to contain slag material based on the boring logs from the on-site geologist.

The results of the gamma walkover survey are shown on Figure 15.

4.2 Soils

Soil data for radium-226, radium-228, isotopic thorium, and isotopic uranium were evaluated to identify the presence and extent of residual contamination related to past MED activities. Table 4-1 provides the following statistical summary by parameter: the number of detections; the minimum, maximum, and average values; and the location of the maximum value.

At all 89 boring locations, two successive soil samples were collected from 0 to 0.15 m (6 in) and 0.15 to 0.46 m (6 to 18 in) below grade. At 85 of 89 boring locations, the third soil sample was collected from 0.46 to 0.76 m (18 to 30 in) below grade. The depth of the third sample in the remaining four borings varied but never exceeded 1.5 m (5 ft) below grade.

Analytical soil data are summarized in the following sections and presented in Table 4-2. The analytical data for KAPL constituents, which include isotopic plutonium, cesium-137, and strontium-90, are presented in Table D-1 in Appendix D. It is noted that some analytical results were rejected because lab quality control data showed tracer recovery rates outside the acceptable range.

Radium-226 and Radium-228

A total of 267 soil samples and 48 field duplicates[3] were collected for laboratory analysis of radium-226 and radium-228.

Radium-226 was detected in all samples collected, with concentrations ranging from 0.229 picocuries per gram (pCi/g) at C2-17 to 155.15 pCi/g at Hotspot 02, and an average concentration of 2.457 pCi/g. The elevated result from Hotspot 02 was collected 0.5 to 1.5 ft below grade. This contamination is likely limited to the immediate area around Hotspot 02 because an adjacent sample, Hotspot 01, was collected only a few inches from Hotspot 02, and exhibited much lower radium-226 concentrations that ranged from 1.5 to 2.9 pCi/g. Hotspot 06, located in the central western part of VP H', also exhibited an elevated concentration of radium-226, 101.25 pCi/g at a depth of 0.5 to 1.5 ft below grade.

Radium-228 was detected in 256 of 267 samples collected. Detections ranged from 0.331 pCi/g at C1S4-02 to 1.537 pCi/g at C1S4-09 (0.5 to 1.5 ft below grade), with an average concentration of 0.872 pCi/g.

Isotopic Thorium

A total of 267 soil samples and 48 field duplicates were collected for analysis for isotopic thorium. One sample was rejected.

Thorium-228 and thorium-230 were detected in 264 of the 266 samples analyzed. Thorium-228 concentrations ranged from 0.112 pCi/g at C2-17 to 1.532 pCi/g at C1S2-10 (0 to 0.5 ft below grade). The average concentration among the detections was 0.812 pCi/g. Concentrations of thorium-230 ranged from 0.215 pCi/g at C1S4-10 to 228.693 pCi/g at Hotspot 02 (0.5 to 1.5 ft below grade). The average concentration among the detections was 2.015 pCi/g. Hotspot 01 was collected a few inches from Hotspot 02 and exhibited much lower thorium-230 concentrations that ranged from 1.358 to 4.099 pCi/g.

Thorium-232 was detected in 260 of the 266 samples analyzed. Concentrations ranged from 0.173 pCi/g at C1S1-14 to 1.517 pCi/g at C1S2-10 (0 to 0.5 ft below grade). The average concentration among the detections was 0.783 pCi/g.

Isotopic Uranium

A total of 266 soil samples and 48 field duplicates were collected for analysis for isotopic uranium.

Uranium-234 and uranium-238 were detected in all 266 samples analyzed. Concentrations of uranium-234 ranged from 0.253 pCi/g at C2-17 to 8.252 pCi/g at C1S4-06 (0.5 to 1.5 ft below grade). The average concentration was 1.024 pCi/g. Like uranium-234 data, uranium-238 concentrations averaged 1.021 pCi/g and ranged from 0.275 pCi/g at C2-17 to 8.023 pCi/g at C1S4-06 (0.5 to 1.5 ft below grade).

Uranium-235 was detected in 106 of the samples analyzed, with concentrations ranging from 0.018 pCi/g at C2-06 to 0.292 at C1S4-06 (0.5 to 1.5 ft below grade). The average concentration was 0.059 pCi/g.

[3] For purposes of discussion in this section, the highest concentration was used for those samples with field duplicates.

Soil Summary

The maximum detected concentrations of radionuclides in soil were identified at just four locations situated in the eastern half of the site: C1S2-10 (thorium-228, thorium-232), C1S4-06 (uranium-234, uranium-235, uranium-238), C1S4-09 (radium-228), and Hotspot 02 (radium-226, thorium-230). Slag was identified on the boring log at location C1S4-09 only. All of these borings appear to be situated within the area of the geotextile placed over the location of the former CMSA pad.

4.3 Groundwater

Filtered and unfiltered groundwater samples were collected from three monitoring wells, C1-2-MW-BP1 located on VP H' and two existing monitoring wells, C1-20-BP3 and C1-2-A100-BP4, located on the property immediately north and downgradient of VP H'. The analytical results are shown on Table 4-3 and discussed in the following sections.

Various water quality parameters also are included on Table 4-3. Groundwater quality parameters include alkalinity, total dissolved solids, and anions (e.g., bromide, chloride, fluoride, nitrite, nitrate, orthophosphate, and sulfate). These parameters were intended to qualitatively evaluate groundwater conditions at VP H', if necessary.

Groundwater samples were also analyzed for KAPL constituents for disposal purposes. The KAPL data is presented in Table D-2 in Appendix D.

Radium-226 and Radium-228

Radium-226 was detected in the unfiltered and filtered samples from well C1-20-BP3 at a concentration of 0.145 picocuries per liter (pCi/L), and from the unfiltered sample from well C1-2-MW-BP1 at a concentration of 0.194 pCi/L. Radium-226 was not detected in well C1-2-A100-BP4 or in the filtered sampled from well C1-2-MW-BP1.

Radium-228 was detected in the unfiltered and filtered samples from well C1-2-MW-BP1 at concentrations of 1.046 pCi/L and 0.665 pCi/L, respectively. Radium-228 was also detected in the unfiltered sample from well C1-20-BP3 at a concentration of 0.696 pCi/L. The remaining three samples were non-detect.

Isotopic Thorium

The analytical data for isotopic thorium in groundwater showed one detected concentration of thorium-228 at a concentration of 0.09 pCi/L in well C1-2-A100-BP4. The three filtered results from this well were rejected and isotopic thorium in wells C1-20-BP3 and C1-2-MW-BP1 were all non-detect.

Isotopic Uranium

Uranium-234 was detected in all six samples collected, with concentrations ranging from 0.727 pCi/L in well C1-20-BP3 to 10.276 pCi/L in well C1-2-A100-BP4; both samples were unfiltered.

Uranium-235 was detected in four samples, with concentrations ranging from 0.152 pCi/L (unfiltered) in well C1-2-A100BP4 to 0.269 pCi/L (filtered) in well C1-2-MW-BP1.

Similar to the results for uranium-234, uranium-238 was detected in all six samples collected, with concentrations ranging from 0.545 pCi/L (filtered) in well C1-20-BP3 to 7.49 pCi/L (unfiltered) in well C1-2-A100-BP4.

Groundwater Summary

The majority of analytical results for groundwater showed non-detects and trace levels of radionuclides. On-site well C1-2-MW-BP1 exhibited the highest concentrations of radium-226 and radium-228 at 0.194 and 1.046 pCi/L, respectively. One isotope of thorium, thorium-228, was detected in off-site well C1-2-A100-BP4 at a concentration of 0.09 pCi/L. This well also exhibited the highest concentration of total uranium at 17.918 pCi/L (unfiltered).

4.4 Ponded Water

Ponded water samples (filtered and unfiltered) were collected and analyzed for radium-226, radium-228, isotopic thorium, and isotopic uranium to determine the presence and extent of residual contamination due to past MED activities. Analytical results are shown on Table 4-4. Table 4-1 provides the statistical summary by parameter, including the: number of detections; minimum, maximum, and average values; and location of the maximum value.

Various water quality parameters also are included on Table 4-4. Groundwater quality parameters include alkalinity, total dissolved solids, and anions (e.g., bromide, chloride, fluoride, nitrite, nitrate, orthophosphate, and sulfate). These parameters were intended to qualitatively evaluate the limited surface water conditions at VP H', if necessary. Water samples also were analyzed for KAPL constituents, including isotopic plutonium, cesium-137, and strontium-90, as part of the characterization effort for disposal of IDW. These analytical results are presented in Table D-3 in Appendix D. It is noted that some analytical results were rejected because lab quality control data showed tracer recovery rates outside the acceptable range.

The analytical data are discussed in the following sections.

Radium-226 and Radium-228

Radium-226 was detected in one unfiltered and one filtered sample at locations C1S2-03 and C1S1-04, respectively. Concentrations were 0.1 pCi/L in C1S2-03 and 0.14 pCi/L in C1S1-04. Radium-228 was not detected in any of the eight unfiltered or eight filtered samples.

Isotopic Thorium

Thorium-228 was detected in three unfiltered and six filtered samples. The unfiltered detections ranged from 0.221 pCi/L at C2-10 to 1.087 pCi/L at C2-08. Among the six filtered samples, concentrations ranged from 0.123 pCi/L at C1S1-04 to 0.832 pCi/L at C1S2-07.

No thorium-230 was detected among the unfiltered samples collected, however, five filtered samples exhibited concentrations ranging from 0.03 pCi/L at C2-11A to 0.66 pCi/L at C1S2-07.

No thorium-232 was detected in the eight unfiltered or eight filtered samples collected at the site.

Isotopic Uranium

Uranium-234 was detected in all six samples (two samples were rejected), with concentrations ranging from 0.628 pCi/L at C1S2-07 to 3.207 pCi/L at C2-10. Filtered results were similar, with

detections in all seven samples (one was rejected), and concentrations ranging from 0.664 pCi/L at C1S2-07 to 3.871 pCi/L at C2-10.

Uranium-235 was detected in one filtered (C1S1-04) and one unfiltered (C2-10) sample, with concentrations of 0.109 pCi/L and 0.177 pCi/L, respectively. A total of three samples were rejected.

The analytical results for uranium-238 in unfiltered and filtered samples were similar. In addition, there were rejected samples in each data set, including one filtered and two unfiltered samples. Among the six unfiltered detections, concentrations of uranium-238 ranged from 0.7 pCi/L at C1S2-07 to 2.995 pCi/L at C2-10. Among the seven filtered samples, concentrations ranged from 0.718 pCi/L at C1S2-07 to 3.603 pCi/L at C2-10.

Ponded Water Summary

Detections of radionuclides were observed in approximately one-third of the ponded water samples analyzed, and isotopic uranium accounted for about one-half of the detections. All detections were nominal, e.g., the most elevated was 3.871 pCi/L (filtered) of uranium-234 at location C2-10.

4.5 Concrete Pad

Radium-226, radium-228, isotopic thorium, and isotopic uranium data for the concrete pad samples were evaluated to determine the presence of residual contamination related to past MED activities on the concrete pad located in the southeast corner of the site. The pad was reportedly used for waste incineration. Analytical data are presented on Table 4-5. Concrete samples also were analyzed for KAPL constituents, including isotopic plutonium, cesium-137, and strontium-90, as part of the characterization effort for disposal of IDW. These analytical results are presented in Table D-4 in Appendix D. It is noted that some analytical results were rejected because lab quality control data showed tracer recovery rates outside the acceptable range.

Radium-226 and Radium-228

Radium-226 was detected in all three concrete samples. Concentrations were 0.356, 0.453, and 1.754 pCi/g. Radium-228 was detected in two of the three samples at concentrations of 0.38 and 1.062 pCi/g.

Isotopic Thorium

Isotopic thorium was detected in all three concrete samples. Concentrations of thorium-228 were 0.306, 0.664, and 0.672 pCi/g; thorium-230, 0.291, 0.491, and 1.54 pCi/g; and thorium-232, 0.291, 0.447, and 0.822 pCi/g.

Isotopic Uranium

Uranium-235 was detected at a concentration of 0.045 pCi/g in one of three concrete samples collected. The remaining two samples were non-detect. Uranium-234 and -238 were detected in all six samples collected at concentrations of 0.305, 0.501, and 1.268 p/Ci/g (uranium-234) and 0.308, 0.409, and 1.026 pCi/g (uranium-238).

Concrete Pad Summary

The concrete samples collected from the pad indicated little to no impact from past activities that may have taken place at VP H'. Among the three concrete samples collected, the relatively highest

concentrations of radionuclides were observed in the sample collected from CP-1 at a depth of 0.15 to 0.46 m (6 to 18 in).

5 FATE AND TRANSPORT

A conceptual site model was developed for VP H' that presents a simplified depiction of conditions at the site with respect to source media, transport mechanisms, and receptors (Figure 11). The information is further developed in this section to enhance the understanding of the site with respect to how past operations may have impacted the surrounding environment and potential receptor, and realistically describe current and potential future migration and resulting levels of contamination. The results of the fate and transport analysis are used as the basis for quantifying current and future levels of contaminant exposure by human and ecological receptors as described in Section 6.0.

Radionuclides in soil, groundwater, and ponded water are subject to a number of processes that can affect their migration. For soil, many constituents are subject to adsorption onto soil particles, which can delay migration by varying amounts depending on the constituent in question and the composition of the soil. Water movement through soil may leach constituents, which can move to groundwater or be adsorbed further down in the soil column. Radionuclides in surface soil can also become airborne through fugitive dust emissions or gaseous transport. Details are presented below.

5.1 Transport by Water

The potential fate and transport of radionuclides by water movement through soil is evaluated by means of a soil-water partitioning assessment. This section summarizes the assumptions, analytical framework, and calculations used in the assessment.

The VP H' property is similar in physiography, hydrogeology, and geochemistry to the nearby NFSS, where USACE performed detailed groundwater flow and contaminant-transport modeling throughout the CERCLA process (USACE 2007, 2011a, 2020). The USACE and surrounding sites (e.g., CWM and Modern Landfill) contributed hydrogeologic datasets that together defined a conceptual site model that encompasses the VP H' area. The numerical groundwater flow, particle tracking, and solute transport model of the NFSS IWCS and surrounding balance of plant predicted near-term and future risks to groundwater from NFSS constituents. The modeling did not show NFSS-related impacts transporting from the NFSS to VP H' (USACE 2007, 2011a). Consequently, VP H' is assessed independently for hydrogeological concerns. Hydrogeologic variables and information from the NFSS modeling efforts were used in conjunction with the VP H' sampling data to perform the fate and transport assessment.

The sampling of soils, groundwater, and ponded water at VP H' focused on the delineation of MED/AEC-related constituents in the environment. Site-area operational and processing records, along with significant environmental sampling on nearby sites, indicate that site-related constituents of highest interest include radium, thorium, and uranium. Previous NFSS-specific analyses and VP H' data indicate uranium is the most mobile radionuclide, which is corroborated by NFSS soil and groundwater results that show radium and thorium isotopes do not produce groundwater impacts due to soil partitioning coefficients that promote significant soil adsorption. This condition is observed at VP H', where non-uranium radionuclides are sparsely detected in groundwater or reflect background (or upgradient) ranges. Consequently, only uranium is assessed for fate at the VP H' site (i.e., the balance of radionuclides maintain adsorption to soils or insoluble complexes).

Site-area soil and hydrogeologic data integral to transport analyses and decision making (e.g., permeability, porosity, distribution coefficients [K_d], etc.) were extracted from NFSS- and/or LOOW-specific investigations (USACE 2002a, 2007, 2011a, 2020). These combined datasets provide a significant inventory of hydrogeologic information to use in the VP H' transport

assessment.

The goals of this hydrogeologic analysis include the following:

- Improve the conceptual understanding of groundwater conditions at the site,
- Assess the current transport potential at VP H',
- Provide a predictive tool to assess whether soil impacts will contaminate groundwater, and
- Support risk assessment efforts.

5.1.1 Groundwater Characteristics

The industrial area that surrounds VP H' has been developed for over 70 years (e.g., LOOW property) and is connected fully to public water supplies. Both LOOW- and NFSS-specific analyses of local groundwater conditions show a naturally poor resource containing high total dissolved solids derived from sulfate- and chloride-rich conditions. Groundwater samples from near VP H' mimic these surrounding conditions that reflect USEPA Class IIIb or New York State "GSA" groundwater-quality and -yield criteria. The naturally poor-quality groundwater (high concentrations of total dissolved solids) can be made potable with significant cost-intensive treatment. Nearby fresh-water resources (Niagara River) and municipal sources (county-wide water districts) are available to preclude site groundwater use, which makes the exposure pathway to groundwater incomplete, other than incidental ingestion by a construction worker receptor. Consequently, the VP H' analysis of soils and groundwater for uranium transport is focused on exposure to the construction worker receptor.

5.1.2 Soil Screening Level Calculation

The primary analysis for evaluating uranium transport from soil to groundwater consisted of comparing VP H' soils data to a soil screening level for the protection of groundwater. The calculation method used to estimate a soil screening level for uranium is found in USEPA, 1996, *Soil Screening Guidance: User's Guide, Second Edition*. This methodology includes governing equations that together use site-specific data to estimate a soil screening level that is protective of groundwater based on physical variables and dilution-attenuation factors of the underlying groundwater system. Attachment A in Appendix E provides a tabular and visual representation of the method, along with results of the calculations.

A sensitive parameter in the calculation is the length of the source, which is conservatively assumed to be the entire site length. Consequently, this conservative analysis is the lower bounding model for the site (i.e., if source areas are significantly smaller, then the screening level will increase).

The results estimated on the table in Attachment A of Appendix E are summarized below.

- The soil screening value for total uranium based upon USEPA 1999 calculations for a calculated dilution-attenuation factor of 1.0 is 3.68 milligrams per kilogram (mg/kg); this value is considered highly conservative by USACE since it ignores site-specific inundation by surface water (dilution factor) over a large portion of the site from winter through spring.
- The soil screening value for uranium based upon a dilution-attenuation factor of 4.0 is 14.67 mg/kg.
    - This higher dilution attenuation factor accounts for the soil-water saturation that occurs from surface-water accumulations over a wide area of the VP H' site.
    - Other NFSS-specific analyses (USACE 2020) have used a dilution-attenuation

factor of 20 based upon other USEPA guidance (USEPA 1996); the more conservative factor of 4.0 will be used in this site analysis.

Consequently, the soil screening value of 14.67 mg/kg for total uranium is conservative to evaluate soil-based risks to groundwater at the VP H' site. Site soils data were compared to this screening value by converting uranium-238 activity concentrations to total uranium mass concentrations based on an activity-to-mass conversion factor of 3.003 micrograms per picocurie (µg/pCi). Only two of the 266 soil samples had total uranium mass concentrations exceeded this screening value (Attachment B in Appendix E). The subsequent analyses provide additional decision-making results for VP H'.

5.1.3 Soil-Water Equilibrium Partitioning Analysis

A secondary analysis of the VP H' soils data consisted of a soil-water partitioning assessment where the calculated total uranium mass concentrations are coupled with the average site-wide partitioning coefficient of 122 liters per kilogram (L/kg) (14.6 gallon/pound) for uranium (USACE 2007, 2011a, 2020) to estimate collocated pore-water concentrations in soil.

These uranium data and estimated pore-water concentrations are sorted highest to lowest to exemplify the range of results and likely groundwater concentrations using two dilution-attenuation factors of 1.0 (calculated) and 4.0 (modified estimate to reflect surface-water dilution). These results show that pore-water in contact with the maximum uranium values in soil will generate up to 200 micrograms per liter (µg/L) of dissolved uranium that is diluted and attenuated four-fold to approximately 50 µg/L from vertical and/or horizontal dispersion in the subsurface (Attachment B in Appendix E). If other USEPA guidance was applied to the analysis (a dilution-attenuation factor of 20 in USEPA 2002a), then a calculated maximum value for groundwater would be 10 µg/L.

The actual values for total uranium in groundwater near VP H' range from 1.64 to 22.49 µg/L, converted from uranium-238 values in pCi/L, which generally agree with a dilution-attenuation factor between 4 and 20 for the site, especially considering the expanse of seasonal inundation by surface water and adjacent site uses and characteristics.

5.1.4 Uranium Retardation Analysis

The soils containing uranium impacts will both adsorb the radionuclide in the long term and release a portion to groundwater, which can be adsorbed by downgradient or adjacent unimpacted soils. This difference between water movement and slower uranium movement is the retardation factor. The average flow velocity in site-area groundwater is based upon hydraulic conductivity (permeability) and flow gradient using the following equation (Darcy's velocity):

$V_w = K * i$

where:

V_w = average groundwater flow velocity (m per year)

K = hydraulic conductivity (m per year)

i = local gradient (unitless)

The resulting average groundwater velocity of 2.0E-3 m per year, or 6.6E-05 ft per year, indicates groundwater impacts will not transport significantly from the source areas due to this very low velocity.

The retardation of uranium transport through soils via pore water or groundwater is governed by the following equation:

$R_f = 1 + K_d * (\rho/\varphi)$

where:
R_f = retardation factor (unitless) – a velocity ratio of groundwater to uranium movement in soil
K_d = soil-water partitioning coefficient (L/kg)
ρ = bulk density (kg/L)
φ = total porosity (unitless)

The resulting retardation value using the previously defined soils parameters is 391, which represents the reduction in uranium flow velocities through site soils due to adsorption onto soils. Basically, groundwater flow is 391 times faster than uranium transport in the same groundwater. This indicates that uranium transport velocity in site soils is approximately 1E-06 m per year (3.3E-06 ft per year).

This very low transport rate indicates that most uranium impacts observed in groundwater under and near VP H' are derived from historical MED-related residues that were stored on the surface, exposed to storm water movement, and dispersed into the underlying groundwater. Further uranium dispersion and diffusion from seasonal site conditions (inundation) supplements the attenuation and minimizes subsurface concentrations (i.e., groundwater impacts are more indicative of past residue storage areas rather than transport in the subsurface from source areas to clean areas). This condition was observed on the NFSS and documented in associated CERCLA reports (USACE 2007, 2011a, 2020)

5.1.5 Soil Screening for Uranium Conclusions

The inter-related soil and groundwater conditions at VP H' together indicate that uranium impacts in soil will minimally affect site groundwater conditions. The calculation of soil screening levels, equilibrium partitioning results, and retardation estimates for uranium generally agree and indicate that future site conditions will be protective of groundwater with respect to the future construction worker receptor. Uranium transport is limited to minor dispersion and diffusion from near-surface soils that minimally augment groundwater impacts derived from historical (AEC-related) surface sources for uranium (ore residues).

5.2 Transport by Air

Fugitive dust emissions are not considered to be a significant mechanism for contaminant releases from VP H' because the site is covered by year-round vegetation and seasonal standing water in the poorly drained low-lying areas. Standing water is generally present but disappears during infrequent, prolonged periods of hot and dry weather. Given the presence of a site-wide surface cover most of the year and relatively low wind speeds in the area (see Section 2.1.5), fugitive dust generation is very limited.

Radium-228 and radium-226 eventually decay to gaseous daughter products, radon-220 and radon-222, with half-lives of approximately 55.6 seconds and 3.8 days, respectively, providing a potential opportunity for emission of these isotopes into the air. These isotopes of radon emit alpha particles with both alpha- and beta/gamma-emitting progeny.

6 BASELINE RISK ASSESSMENT

6.1 Overview

The baseline risk assessment consists of two basic components—the human health risk assessment (HHRA) and the ecological risk assessment (ERA)—used to evaluate current and potential future risks to human health and the environment, respectively. The HHRA and ERA evaluate such risks by using the information and data obtained from the RI that characterize the nature and extent (Section 4) and fate and transport (Section 5) of site-related contamination. The results of the HHRA and ERA provide actionable information for determining the need for additional evaluations or remediation measures for the site to protect human health and the environment.

Each risk assessment outlines the potential exposure pathways that require evaluation. Exposure pathways consist of the environmental media (e.g., soil and surface water) that contain site contamination, the receptors—human or ecological—that may be exposed to those contaminated media, and the specific routes of exposure (e.g., ingestion or direct contact). The risk assessments also define the ways by which site contaminants may result in toxic effects to the identified receptors. In the case of human receptors, site contaminants may present cancer risk, risk of stochastic health effects from radiological dose, and non-cancer chemical hazard. Ecological receptors are evaluated for chemical hazard and deterministic, acute effects from radiological dose.

The HHRA initially evaluated potential contaminants by comparing site concentrations to concentrations representative of background conditions to identify distinguishable radionuclides of potential concern (ROPCs). The cancer risk, radiological dose, and chemical hazard posed by these ROPCs were then characterized for all identified human receptors under the current and foreseeable future industrial land use scenario. Any ROPCs which contribute significantly (i.e., greater than 1E-05 incremental lifetime cancer risk [ILCR]) to an overall unacceptable risk accounting all ROPCs (i.e., greater than 1E-04 ILCR) to a future receptor with a reasonable maximum exposure would be considered a radionuclide of concern (ROC) for further evaluation or action under FUSRAP. Figure 16 presents the process flow from sampled constituents of interest to ROC in this HHRA.

The ERA evaluated the identified ROPCs for potential ecological risk by screening ROPC concentrations against ecological screening values. This enabled the determination of whether identified ecological assessment endpoints would potentially be impacted by site-related contamination.

6.2 Human Health Risk Assessment

6.2.1 Introduction

Radionuclides were identified as the only potential contributors to adverse human health outcomes based on the site history (Section 1.1, USACE 2016a) and the characterization of potential contaminants on site (Sections 4 and 5). These radionuclides consisted of radium-226, radium-228, thorium-228, thorium-230, thorium-232, uranium-234, uranium-235, and uranium-238. The potential adverse health outcomes included cancer risk, radiological dose effects, and non-cancer hazard (specifically kidney toxicity, see Section 6.2.4).

The HHRA began by identifying radionuclides that are present on site at concentrations that exceed those representative of background. Any radionuclides exceeding background concentrations were considered to be site-related and identified for consideration as a radionuclide of potential concern (ROPC). ROPCs were then further evaluated through the exposure assessment and toxicity

assessment to characterize potential cancer risk, radiological dose, and non-cancer hazard resulting from human receptor exposure to ROPCs.

The exposure assessment included a description of the exposure setting and the exposure pathways—the specific environmental media, human receptors, and exposure routes linking the two. It also defined the exposure unit (EU), which provides for the quantification of exposure based on mean contaminant concentrations in exposure media. Specific receptor exposures were then quantified through the selection of exposure parameters.

The toxicity assessment defines the adverse health effects potentially arising as a result of exposure to site contaminants and the manner by which such effects are quantified. This included using cancer risk coefficients and radiological dose coefficients to estimate the risks and doses resulting from the quantified intake of, and external exposure to, radionuclides within environmental media. This toxicity assessment provided the final link with the quantified exposures to enable the characterization of receptor risks and radiological dose predictions associated with site contamination.

6.2.2 Identification of Radionuclides of Potential Concern

6.2.2.1 Screening Process

ROPCs were identified by first comparing concentrations of radionuclides measured on site as part of the RI to concentrations measured at off-site locations previously established as representative of background conditions for NFSS (i.e., locations not impacted by the site) (USACE 2007). A radionuclide with a site distribution exceeding its background distribution was considered to be site-related and identified as an ROPC. All identified ROPCs were then also screened for potential chemical toxicity.

Background screening:
The comparison of radionuclide site distributions to background distributions was performed for all environmental media on site—surface soil [0 to 0.15 m (0.5 ft)] below ground surface (bgs), subsurface soil [> 0.15 m (0.5 ft) bgs], groundwater, and surface (ponded) water. The screening against background consisted of comparing both central tendency and upper end values between the site and background distributions of radionuclide activities. The central tendencies of site and background distributions were distinguished using non-parametric Wilcoxon-Mann-Whitney tests[4]. The upper ends of site and background distributions were distinguished by comparing site upper tolerance limits (UTLs) to background threshold values (BTVs) for NFSS (Table 6-1). Site UTLs were selected as the lesser of the maximum value of each radionuclide's site sample and the 95% UTL with 95% coverage (UTL_{95-95}) calculated for each radionuclide's site sample distribution[5] (Table 6-2). BTVs were similarly selected as the lesser of the maximum value and the calculated UTL_{95-95} value for each radionuclide's background distribution. If either portion of a radionuclide's site activity distribution—central tendency or upper end—exceeded that for the background

[4] This test is alternatively known as the Mann-Whitney *U* test or the Wilcoxon rank sum test. The test statistic (*U*) is used to determine the probability (*P*-value) that—under the null hypothesis that the site distribution is not stochastically greater than the background distribution—the difference between mean ranks would be at least as large as that observed. One-sided tests were conducted with $\alpha = 0.05$.

[5] UTL_{95-95} values were estimated using ProUCL 5.1 software (USEPA 2013) under parametric (normal-, lognormal-, or gamma-distributed) and non-parametric (order statistics) assumptions (Singh and Singh 2013). The exception is that lognormal estimates were discarded for groundwater and surface water because of small sample sizes that produce inflated estimates under lognormal assumptions. USACE selected the estimation for the distribution type identified by the software as best fitting the sample distribution. When the software identified uncertainty in sample distributional properties, USACE—in order to maintain conservatism—selected for site distributions the greatest value of the potential distribution types and for background distributions the smallest value of the potential distribution types.

distribution, then the radionuclide was considered to be site-related and flagged as a ROPC (Table 6-3).

Chemical toxicity screening:
ROPCs that present chemical-based hazard or cancer risk in addition to radiological-based dose and cancer risk were also screened for chemical toxicity. The screening for chemical toxicity used total mass concentrations, whereas the screening against background for the identification of ROPCs used radioactivity concentrations. The chemical toxicity screening used established USEPA (2003a, 2022a) screening protocols, which are based on contaminant concentrations in environmental media determined to be protective of human health for particular receptor groups (e.g., residents or industrial workers) at an incremental lifetime cancer risk (ILCR) of 1E-06 and a hazard index of one (unity). These risk- or hazard-based screening levels are based on regularly updated toxicity criteria, default (conservative) exposure assumptions, and physical and chemical parameters. Therefore, mass concentrations of ROPCs in site environmental media that are less than these screening levels are determined to be protective of human health under relevant exposure scenarios. For soils, the chemical toxicity screening used assumptions for industrial exposure. For groundwater and surface water, established industrial screening assumptions levels are not readily available (USEPA 2022a) so residential assumptions were used instead, which provide a more conservative screen than would be the case using industrial assumptions.

6.2.2.2 Screening Results

Five site radionuclides were identified as exceeding background concentrations in surface soil—radium-226, radium-228, thorium-230, uranium-234, and uranium-238 (Table 6-3). All five had site UTLs exceeding BTVs; only radium-226 also had a central tendency greater for the site distribution than for the background distribution. The screening for subsurface soil identified the same radionuclides as exceeding background, plus uranium-235. These radionuclides had subsurface soil site UTLs exceeding BTVs; radium-226, uranium-234, and uranium-238 also had central tendencies greater for site distributions than background distributions.

The radionuclides identified as exceeding background were flagged as ROPCs. Because uranium-235 was identified as a ROPC in subsurface soil and uranium isotopes are assumed to exist on site in natural ratios, uranium-235 was additionally considered an ROPC in surface soil. Radium-228 was not considered a ROPC for either surface or subsurface soil—despite site UTLs exceeding BTVs in both soil horizons—because site-related radium-228 contamination would be contingent on coincident contamination from the thorium-232 decay chain. Radium-228 is generated by the radioactive decay of thorium-232 and subsequently decays to thorium-228, and neither thorium radionuclide on site was identified as exceeding background in soil. Radium-228 is not expected to exist as its own source term without thorium-232 based on site history, and its short half-life (5.75 years)[6] would couple it to the presence of thorium-228 (half-life of 1.9 years) if still present from MED/AEC activities. As such, the exceedance of the radium-228 BTV by the site radium-228 UTL was considered a sampling anomaly[7] and not representative of site contamination and radium-228 was not considered a ROPC.

In summary, five radionuclides were identified as ROPCs in both surface and subsurface soil—radium-226, thorium-230, uranium-234, uranium-235, and uranium-238 (Table 6-4).

[6] and that of its immediate progeny, actinium-228 (6 hours)
[7] The BTVs selected for radium-228 in surface and subsurface soil were maximum concentrations of 15 samples, which were less than calculated $UTL_{95\text{-}95}$ values by 17% and 12%, respectively. The maximum concentrations are likely artificially low BTVs because a sample size as small as 15 is unlikely to include the 95th percentile concentration. In contrast, site UTLs for radium-228 were based on the $UTL_{95\text{-}95}$ estimates from sample sizes of 89 and 178 for surface and subsurface soil, respectively.

Two site radionuclides were identified as exceeding background concentrations in groundwater and considered groundwater ROPCs—uranium-234 and uranium-238 (Table 6-3). Site distributions of both radionuclides exceeded background distributions based on UTLs, but only uranium-238 also exceeded background based on central tendency estimates. As with soil, uranium-235 was additionally considered a groundwater ROPC because of the assumed presence in natural ratios with the other two uranium isotopes identified as groundwater ROPCs. Thorium-228 was the only radionuclide with its site surface water distribution exceeding its background surface water distribution (based on a site UTL exceedance of the BTV; Table 6-3). However, thorium-228 was not considered to be a surface water ROPC because site-related thorium-228 contamination would be contingent on coincident contamination from the thorium-232 decay chain in either surface water, surface soil, or both. Thorium-228 is generated by the radioactive decay of thorium-232 and then radium-228, and neither of those two parent radionuclides on site were identified as exceeding background in either medium (i.e., surface water and surface soil). As such, the exceedance of the thorium-228 BTV by the site thorium-228 UTL was considered a sampling anomaly[8] and not representative of site contamination and thorium-228 was not considered an ROPC.

In summary, three radionuclides were identified as ROPCs in groundwater—uranium-234, uranium-235, and uranium-238—and no radionuclides were identified as ROPCs in surface water (Table 6-4).

Uranium isotopes were the only ROPCs identified that present a corresponding chemical hazard or risk. Lead isotopes resulting from the decay of radium-226, a soil ROPC, were not considered a relevant chemical hazard requiring evaluation due to their high specific activities (the amount of radioactivity per unit mass). Lead present in site soils as a result of radium-226 decay would contribute negligibly to total lead mass concentrations associated with unimpacted soils. Total uranium (mass concentrations rather than activity concentrations) was therefore identified as the only potential chemical contaminant and screened for chemical toxicity using the USEPA's (2022a, 2022b) risk-based screening protocols and regional screening level (RSL) calculator. A target ILCR of 1E-06 (the lower end of the USEPA's risk management range) and a target non-cancer hazard quotient (HQ) of 0.5 were used to calculate RSLs. A hazard quotient of 0.5 was used to account for combined exposure to uranium in soil and groundwater. Uranium was the only site-related chemical potentially posing a chemical hazard and thus in this case the individual hazard quotients combine to equal the overall hazard index (unity). The composite worker receptor (representative of the generic industrial exposure scenario) was selected for calculating the soil RSL and the residential receptor (representative of residential tapwater exposure) was selected for calculating the groundwater RSL, as no industrial exposure scenarios are readily available in the calculator for groundwater exposure. For both exposure scenarios, USACE entered the non-cancer oral reference dose (RfD_o) available from the USEPA's (2022c) Integrated Risk Information System (IRIS), which represents a Tier I toxicity source under the hierarchy for toxicity values in CERCLA risk assessments established in USEPA (2003a) and USACE (2016b). This RfD_o (3E-03 mg/kg-day) was derived by the USEPA (1989) based on kidney toxicity, which is the critical effect for non-radiological, non-cancer hazard associated with exposure to uranium (Maynard and Hodge 1949, Gilman et al. 1998a,b,c, USEPA 1989, ATSDR 2013).

The RSL calculated for soil was 1,725 mg/kg and the RSL calculated for groundwater was 30 µg/L. Total uranium mass concentrations—derived as summed ratios of individual uranium isotope activity concentrations to specific activities—were less than these screening level concentrations for all media and thus no chemicals of potential concern were identified (Table 6-5).

[8] The BTV selected for thorium-228 in surface water was the maximum concentrations of 15 samples, however all background samples were non-detect. Therefore, this BTV is likely artificially low and any detects contributing to the site UTL would be expected to result in a BTV exceedance.

6.2.3 Exposure Assessment

The exposure assessment qualitatively and quantitatively evaluates the frequency, duration, and intensity of exposure to a radiological contaminant. It evaluates the exposure routes (e.g., external penetrating radiation, ingestion, or inhalation), the intake rates associated with these routes, and the resulting dose. This allows for estimating the type and magnitude of potential exposures to ROPCs at the site. The exposure assessment includes the following components:

- Characterization of the exposure setting (including current and future land uses);
- Identification of exposure pathways (including exposure scenarios, receptors, and exposure media, as framed by the CSM);
- Delineation of the exposure unit(s) (EUs);
- Evaluation of exposure parameters; and
- Calculation of exposure point concentrations (EPCs).

6.2.3.1 Exposure Setting

The VP H' site is currently zoned for industrial land use and is adjacent to existing industrial operations performed by the current site owner, who restricts access to the site. The vicinity property is largely vacant land with no structures except an abandoned railroad track and is a combination of areas of natural vegetation and areas of industrial impact (e.g., storage and historical industrial debris). Current operations on site are limited to air monitoring requiring occasional access to the site by industrial or maintenance employees about once per week. Exposure under current conditions thus consists of limited industrial and maintenance worker exposure and potential trespasser exposure by adults or adolescents. Exposure under potential future conditions could include the same exposures occurring under current conditions, plus the following: more expanded industrial worker exposure commensurate with activities occurring at the adjacent industrial operations or generic industrial exposure, a maintenance worker without a permanent on-site workstation but exposed during periodic time on site as part of a broader operation (i.e., commissioned to the site based on either routine or intermittent maintenance needs), construction worker exposure, and recreational adult or adolescent exposure. Any potential future recreational activities (e.g., hiking, hunting) are assumed to incur the same exposure as current trespassers, given the small size of the site and its limited recreational features, so the two groups of receptors—current trespassers and potential future recreators—are considered to be the same for the purposes of this risk assessment (Table 6-6).

6.2.3.2 Exposure Pathways

The exposure pathways are the means by which potential human receptors could be exposed to site contamination and result from the combination of exposure media, exposure routes, and potential receptors. Exposure pathways are identified through the development of the CSM (Section 2.3 and Figure 11).

6.2.3.2.1 Exposure Media

Potential exposure media for human receptors on site are surface and subsurface soil, groundwater, and surface water. Receptors could potentially be exposed to both surface [0 to 0.15 m (0.5 ft) bgs] and subsurface soil [> 0.15 m (0.5 ft) bgs]. Potential construction workers are assumed to have simultaneous exposure to both surface and subsurface soil through intrusive subsurface activities (i.e., a homogenous total soil exposure medium). All other receptors are predominantly exposed to

surface soils, with subsurface exposure occurring only via external gamma radiation (shielded by the surface layer) and gradual down-blending of the mixing zone (0.15 m) assumed for direct contact exposures into the subsurface soil horizon as the surface layer erodes over time (Table 6-6; see also soil mixing layer figures in Appendix G).

Groundwater is not used as potable water currently, nor under foreseeable future land use. As such, exposure to groundwater could only occur through intrusive activities associated with construction. The surface water is limited to localized areas of shallow ponding and does not present an exposure medium typical for commonly evaluated surface water receptors (e.g., recreational activities in streams or rivers, or exposure through fish tissue harvested from a site). As such, exposure to surface water is also assumed to be limited to intrusive activities associated with construction; neither industrial workers, trespassers, nor recreators would experience anything more than negligible exposure to the ponded surface water on site. Under the construction worker scenario, surface water and groundwater are assumed to present coincident exposure conditions associated with intrusive soil-based work activities.

6.2.3.2.2 Exposure Routes

Exposure routes considered complete for surface and subsurface soil were incidental ingestion, inhalation of particulates (fugitive dust), and external gamma radiation. Dermal exposure was considered a complete but unquantifiable exposure route because no dermal cancer slope factors have been developed for radionuclides, as the dermal exposure route produces negligible radiological risk compared to the three other pathways quantified here (USACE 2002b, ANL 2007). Uranium also does not have a dermal absorption factor for evaluating chemical exposure, as insufficient information exists about the absorption efficiency of uranium through skin, precluding use of any default value (USEPA 2004). The only exposure route considered complete for groundwater and surface water was incidental ingestion.

6.2.3.2.3 Receptors

Human receptors considered in the CSM under both current and future land use were industrial workers, maintenance workers, construction workers, and trespassing or recreational adults and adolescents.

Industrial workers were considered representative of current industrial operations occurring off site but on adjacent property of the site owner, as well as potential future on-site operations under similar industrial land use. This includes primarily indoor work (either off site or on site under a future scenario, as no buildings currently exist on site), with limited exposure to environmental media outdoors (1 hour of an 8-hour workday). Maintenance workers were also considered representative of current industrial operations on adjacent property and potential future on-site operations[9]. Maintenance worker exposure was limited to periodic time on site (4 hours/week), all of which was considered time outdoors exposed to site soils. This represents a scenario where maintenance workers do not have a permanent on-site workstation, but rather travel around a broader operation or are commissioned to the site based on either routine or intermittent maintenance needs. Note that maintenance workers could also spend time on site indoors (under a future scenario), but such exposure is not quantified in this baseline risk assessment.

Construction worker exposure was assumed to be sub-chronic, i.e., occurring over the course of one year to represent a construction project. Trespasser/recreational adult or adolescent exposure was

[9] Exposure factor values for the maintenance worker were derived after discussions with site owner regarding current operations in the vicinity of the site.

assumed to occur for 4 hours per week for 26 weeks of the year, given the likely seasonal nature of such activities.

6.2.3.3 Exposure Unit

The entire VP H' site was considered a single exposure unit, consisting of 1.6 hectares (4 acres) of contiguous area over which any of the current or potential receptors would be exposed. This exposure is assumed to occur equally throughout the exposure unit such that the average concentrations of radionuclides in each environmental medium represent the exposure point concentrations (EPCs). Soil samples obtained during the RI were systematically located across the 1.6 hectares (4 acres), with known areas of contamination receiving finer-scale coverage, and with the areas observed to have the greatest contamination receiving additional confirmatory or bounding samples (Figure 12). As such, by considering a single exposure unit and using the average of all soil samples to represent that exposure unit, the exposure unit sample population is overrepresented by the biased samples taken from the most contaminated areas, thereby producing conservative EPCs for surface and subsurface soils (Section 6.2.3.5).

6.2.3.4 Exposure Parameters

Exposure parameter values entered in RESRAD for modeling receptor exposure to radionuclides generally consisted of RESRAD defaults, values selected from USEPA's National Center for Environmental Assessment *Exposure Factors Handbook* (USEPA 2011a), as implemented through Office of Solid Waste and Emergency Response directive 9200.1-120 (USEPA 2014a), and exposure duration and frequency values identified in a USACE (2002b) white paper for using RESRAD for CERCLA radiological risk assessment (Table 6-6).

The overall suite of default or site-specific exposure parameters was reviewed for consistency with a reasonable maximum exposure (RME) scenario. The RME scenario represents the maximum exposure reasonably expected to occur at the site within the potentially exposed population—typically considered to be exposure that falls within the 90th to 98th percentile (USEPA 1992). Site-specific exposure parameters must collectively remain representative of the overall RME (ITRC 2015)—that is, each individual parameter should not necessarily reflect the upper percentiles, so long as the overall exposure does.

6.2.3.5 Exposure Point Concentrations

Site EPCs used for calculating exposures were considered to be the average ROPC concentrations measured across the exposure unit, including contributing activity concentrations from the background distribution of ROPCs (i.e. gross EPCs). Separate EPCs for each ROPC were calculated for surface soil [0 to 0.15 m (0.5 ft) bgs] and subsurface soil [0.15 m (0.5 ft) to bottom of boring, maximum 1.5 m (5 ft) bgs] in the site exposure unit. To accommodate external exposure of receptors to both surface and subsurface soil simultaneously, each EPC was entered into RESRAD models and risks from each soil horizon were calculated independently and then summed to produce the total risk and dose from external exposure to site soils. Subsurface EPCs were implemented with an uncontaminated cover depth of 0.15 m (0.5 ft) to model the surface layer for shielding of external gamma from the subsurface layer (Table 6-6). For construction worker exposures—which were assumed to have simultaneous exposure to both surface and subsurface soil through intrusive subsurface activities—a total soil medium EPC was calculated by weighting individual surface and subsurface EPCs according to their relative contribution to the total soil column. Surface soil [0.15 m (0.5 ft) thick] was weighted 10% and subsurface soil [1.35 m (4.5 ft) thick] was weighted 90%. Although construction workers are sometimes assumed to have exposure to soil 3 m (10 ft) bgs, this risk assessment assumed maximum exposure depth would be 1.5 m (5 ft) (commensurate with

maximum soil boring depth) rather than modeling additional exposure to uncontaminated soil at greater depth; this assumption may provide conservatism to the estimated construction worker exposure.

For samples with field duplicates (Section 4.2), the greater of the primary sample and the duplicate sample was used for calculating EPCs. All reported values for radionuclide concentrations, regardless if they were negative or less than the method minimum detectable concentration, were included in the EPCs calculations as either can be considered representative of the latent distribution of radiologically-measured values without censoring the dataset. This is because nominal or negative radioactivity concentrations are typical in analytical results which are derived by correcting activity measurements for the instrument's intrinsic response to background radiation. Note, however, that very few negative values were measured for radioactivity in soils (Table 4-2).

Gross EPCs were calculated as the 95% upper confidence limit on the mean (UCL_{95}) (USEPA 1992, Singh et al. 2006) for all samples in either surface or sub-surface soil (Table 6-7). UCL_{95} estimates were calculated for normal, lognormal, and gamma distributions, as well as non-parametric techniques that do not assume a specific type of distribution for the data. Parametric estimates for uncensored data (non-detections treated as detections, see above) used maximum likelihood estimation (Myung 2003). Non-parametric estimates used analytical equations or bootstrap resampling methods to estimate population statistics based only on the sample data and not a particular distribution. Calculations were performed using ProUCL 5.1 software (USEPA 2016b), which provides a recommended UCL_{95} to use based on goodness-of-fit tests for each distribution, sample size and variance, and/or bootstrap performance. ProUCL output files are included in Appendix F. When multiple estimation methods were recommended, the method resulting in the greatest (most conservative) UCL_{95} estimation was selected, except for unstable or inflated estimates (e.g., Land's H lognormal estimates or some bootstrap estimates). Consistent with current guidance (Singh and Singh 2015), maximum detected concentrations were not used as EPCs, excepting for groundwater which had limited sample size (n = 3) that precluded robust UCL_{95} estimations (EPCs are nevertheless reported for comparison purposes; Table 6-7). Setting the gross EPC to the maximum concentration resulted in gross EPCs that were less than the estimated UCL_{95} for all three ROPCs in groundwater (n = 3).

6.2.4 Toxicity Assessment

A toxicity assessment was performed to identify the types of potential adverse health effects associated with exposure to contaminants at the VP H' site and the potency of such exposures. The toxicity assessment quantitatively evaluated cancer risks and radiological dose rates associated with exposure to the ROPCs in environmental media. Chemical-based cancer risk and non-cancer hazard (rather than radiological-based) was not evaluated further because uranium isotopes were the only ROPCs that present corresponding chemical-based adverse health effects and the potential chemical hazard associated with uranium in environmental media at the site was determined to be negligible for all potential exposure scenarios based on the screening procedures (Section 6.2.2).

The central component of the toxicity assessment was the identification of cancer risk coefficients and radiological dose coefficients for each ROPC, which quantify the relationship between the magnitude of exposure to the ROPCs and the probability of adverse health effects. Risk and dose coefficients vary by exposure route (inhalation, ingestion, and external gamma radiation) and exposure medium, as each route-medium combination presents different efficiencies by which radioactivity is imparted to the human body.

The cancer risk coefficients represent the probability of developing radiation-induced cancer due to exposure to a specific radionuclide via the given exposure route and medium (in units of risk/pCi).

The USEPA classifies all radionuclides as Group A carcinogens (known to cause cancer in humans). The cancer risks associated with radiation are generally considered to be linear with exposure (a non-threshold dose-response relationship), resulting in the risk of carcinogenesis being defined by the slope of cancer incidence probability with exposure level; as such, cancer risk coefficients are often referred to as cancer slope factors.

The radiological dose coefficients represent the level of effective or committed radiological dose to a receptor per unit of radioactivity exposure. The quantity of radioactivity to which a receptor is exposed is the rate of nuclear disintegrations, and the energy associated with such disintegrations varies by radionuclide and by the efficiency with which the energy is imparted to a receiving biological tissue. The amount of energy that is absorbed is measured as an absorbed dose—a physical deterministic quantity (i.e., Gray—defined as Joules per kilogram of matter, or rad—defined as 0.01 Gray) (Fisher and Fahey 2017). The resultant acute tissue damage is likewise considered deterministic. Any higher-level adverse health outcomes, however, are considered stochastic (a random process) and measured as an effective dose based on the biological effectiveness of the radiation type and energy (defined as a unitless radiation weighting factor). The units used here to quantify effective dose are the Sievert or Roentgen equivalent man (rem), which are standardized units representing the stochastic risk of human health effects induced by ionizing radiation, including cancer, genetic effects, and teratogenesis (birth defects, developmental abnormalities). For example, 1 rem represents an excess (relative) risk of cancer of 0.04 to 0.05% in the adult population (ICRP 2007), and cancer risks are usually the limiting risk (i.e., greater than for genetic or teratogenic effects) (USEPA 2015). Dose coefficients (in units of mrem/pCi) are conversion factors that relate the radioactivity level (pCi) to the effective radiological dose for a radionuclide and receptor combination (mrem).

The cancer risk coefficients and dose coefficients are thus related and overlap in the information they provide, in that both are used to communicate the relative level of risk for radiation-induced carcinogenesis (with dose additionally encompassing other non-cancer stochastic health effects). However, their derivations and quantifications differ. Cancer risk coefficients are based on absorbed dose rates for each tissue serving as a potential cancer site, age- and gender-specific risk per unit dose, age- and gender-specific intake data for environmental media, and the vital statistics of a reference population (USEPA 2015). They equal the probability (i.e., risk) of cancer incidence under the given exposure scenario. Dose coefficients, in contrast, convert from radioactivity levels to the effective dose metric (rem)—a derived surrogate for risk, based on a reference model for uniform, whole-body radiation that integrates radiation types, tissue sensitivities, population groups, and various weighting parameters applied to a measurable dose (i.e., absorbed dose) (ICRP 2015, Costa et al. 2016, Fisher and Fahey 2017). One key difference compared to cancer risk coefficients is that the effective dose coefficients do not consider the variability in biological responses occurring for spatiotemporally non-uniform internal deposition of radionuclides (Eckerman et al. 1999, Fisher and Fahey 2017). The effective dose was derived to provide a metric for radiation protection and regulatory purposes (Fisher and Fahey 2017).

Radionuclide-specific risk and dose coefficients from published databases were used to calculate the incremental risks of carcinogenesis (morbidity) and the estimated radiological effective doses associated with exposure to site ROPCs. Risk coefficients were obtained from Federal Guidance Report 13 (Eckerman et al. 1999)[10]. Dose coefficients were obtained using International Commission on Radiological Protection (ICRP 1991) methodologies[11].

[10] Note that FGR 13 has been targeted for updates based on updated radiogenic cancer risk models (USEPA 2011b) but this has not yet occurred.

[11] Ingestion and inhalation dose coefficients derived using ICRP (1991) methodologies are available within ICRP (1996) Publication No. 72; external dose coefficients were derived within the RESRAD software used to implement dose calculations.

6.2.5 Risk and Dose Characterization

6.2.5.1 Methods

The radiological cancer risks and doses attributable to exposure to site soils was estimated using RESRAD-ONSITE software (v. 7.2) produced by Argonne National Laboratory (ANL 2016a, Kamboj et al. 2018), which incorporates code for modeling radiological activities, decay, and exposures over time for environmental media. The RESRAD-ONSITE models were implemented using nuclear decay data for dosimetric calculations from ICRP (1983) Publication No. 38, dose estimation methodologies from ICRP (1991, 1996), and risk coefficient calculation methodologies from Eckerman et al. (1999).

Input parameters for the RESRAD model, including receptor exposure parameters and source term modeling parameters, are outlined in Table 6-6. Lastly, gross EPCs for the site exposure unit (Section 6.2.3.5) were entered into the RESRAD software to represent the radiological source term to which receptors are exposed. These methodologies and parameterizations are coupled with the risk and dose coefficient publications outlined in the toxicity assessment (Section 6.2.4) to produce the estimated receptor risks and doses attributable to ROPCs at the site.

Risks and doses were estimated for the present (year 0) and future conditions (year 1,000) based on the modeling of radioactive decay and radiological ingrowth of daughter products and of source removal via erosion and leaching to groundwater. RESRAD output files are provided in Appendix G.

For groundwater exposures, simple analytical estimations were performed using EPCs for each ROPC, risk or dose coefficients specific to each ROPC and the water ingestion route, and basic exposure assumptions for construction worker receptors[12]. For example, dose estimations for groundwater were determined by the following calculation:

$$Dose_{eff} = EPC_{gw} \cdot DCF_{ing} \cdot IR_{cw\text{-}gw} \cdot ED_{cw} \cdot EF_{cw}$$

where,

$Dose_{eff} =$ effective radiological dose (mrem)
$EPC_{gw} =$ exposure point concentration for groundwater (pCi L^{-1})
$DCF_{ing} =$ dose conversion factors for ingestion (mrem pCi^{-1})
$IR_{cw\text{-}gw} =$ groundwater ingestion rate for construction workers (L day^{-1})
$ED_{cw} =$ exposure duration for construction workers (years), and
$EF_{cw} =$ exposure frequency for construction workers (days $year^{-1}$).

The groundwater ingestion rate was set to 2.5 ml day^{-1} based on an assumption that incidental ingestion of groundwater during intrusive activities might be 0.1% of the adult drinking water rate (sourced from USEPA 2014a) for the RME scenario (Section 6.2.3.4). Little guidance is available for estimating incidental ingestion rates of groundwater or surface water. Exposure duration and frequency were set as in Table 6-6 (1 yr and 250 day $year^{-1}$, respectively).

The calculations for cancer risk were the same except that the dose conversion factors were replaced by cancer risk coefficients for water ingestion (in units of pCi^{-1}), which resulted in a unitless

[12] Construction workers were the only receptors assumed to be exposed to groundwater (see Sections 6.2.3.2.1 and 6.2.3.2.3).

probability that estimates the ILCR to construction workers resulting from exposure to groundwater. Risk coefficients were sourced from Eckerman et al. (1999) and dose coefficients were sourced from ICRP (1996) (Table 6-8).

After first calculating radiological doses and ILCR using the gross EPCs for site ROPCs, calculations were repeated using arithmetic mean activity concentrations representative of site-specific background conditions (Table 6-1). These results constitute the portion of gross dose and risk that are attributable to background exposures rather than to AEC-related contamination. Lastly, calculations were repeated using net EPCs (gross EPCs minus arithmetic mean concentrations) to produce the dose and risk attributable only to AEC-related contamination. This is consistent with how radiological dose assessment is explicitly considered to be the dose above natural background dose (NRC 1994, 2001, 2006a,b), and with risk assessment guidance for quantitatively evaluating background (USACE 2011b, USEPA 2002b, 2014b).

6.2.5.2 Results

The maximum gross ILCR calculated for present baseline conditions (year 0) was for potential industrial workers (5.6E-05) (Table 6-9). Approximately 21% of that risk (1.2E-05) is attributable to background radiation, resulting in a net site-related ILCR of 4E-05 for industrial workers. These risks were followed by those for potential maintenance workers (Table 6-10) and construction workers (Table 6-11), which each had intermediate estimates of net ILCR (~1E-05). The minimum net ILCR was for the potential trespasser (1.1E-05)—the sum of adolescent (Table 6-12) and adult (Table 6-13) net ILCR to incorporate the full course of potential exposure.

The maximum predicted effective radiological dose rate at year 0 was for potential construction workers (18.4 mrem/year gross) and the minimum was for potential maintenance workers (0.9 mrem/year gross). Approximately 13% of the dose to construction workers (2.4 mrem/year) is attributable to background radiation, resulting in a net site-related dose rate of 16 mrem/year for construction workers. Potential industrial workers and trespassers were predicted to receive intermediate net dose rates (2.2 and 3.7 mrem/year, respectively). Construction workers were predicted to receive the greatest dose rate but estimated to have the lowest ILCR of all worker receptors because construction workers are assumed to be exposed to site contamination for only a one-year duration. Their exposure during that year is greater than for any other receptor, resulting in the greatest predicted dose rate. Moreover, the total soil weighted EPCs used for construction worker exposure were greater than the surface soil EPCs that dominated the exposure for all other receptors (Section 6.2.3.5) Each of the other worker receptors, however, are assumed to have repeated exposures to the site contamination over the course of multiple years (Section 6.2.3.4), resulting in cumulative cancer risk that exceeds those estimated for the construction worker while not having an impact on dose rate (mrem/year).

Trespassers had the lowest ILCR (summed adolescent and adult) of any receptor, despite being exposed for many additional years compared to the construction worker, and despite being the only receptors exposed to contamination via consumption of game meat, mainly because the fraction of time spent outdoors on site was comparatively low (Table 6-6). Also, trespassers had the lowest ILCR but not the lowest annual dose rate because the relatively elevated dose rate would occur during exposure as an adolescent (3.7 mrem/yr; Table 6-12) but not as an adult (0.4 mrem/yr; Table 6-13). The elevated radiological exposure to adolescents accrues for only 6 years, whereas the adult exposure accrues for 20 years and thus dominates the contribution to overall ILCR. This difference in annual radiological dose rates among adolescents and adults occurred because the age-dependent dose coefficients (sourced from ICRP 72) employed for ingestion in dose calculations were approximately two to five times greater for the adolescent than for the adult trespasser.

These results for ILCR estimation and effective radiological dose rate prediction were generally the same for the simulation of year 1,000, except that both ILCR and dose for all receptors was slightly greater (Table 6-14). This increase over time in ILCR and dose is the result of two main effects. Firstly, the surface soil horizon [0.15 m (0.49 ft)] by that time will have been eroded by 0.06 m (0.2 ft) (40%) (Table 6-6), thereby releasing the greater subsurface soil EPCs (Table 6-7). Secondly, non-negligible radiological ingrowth of radium-226 from thorium-230 will have occurred (Tables 6-9 through 6-13). The additional risk and dose resulting from this ingrowth is listed as attributable to thorium-230 because that is the original source term input to the RESRAD model, but this additional risk and dose is actually attributable to the progeny (radium-226 through bismuth-214) which exhibit strong external gamma emission (i.e., results tables show effects of each radionuclide regardless of whether the radioactivity producing those effects is from the initial source radionuclide or from its progeny). Thorium-230 itself is an alpha emitter that contributes negligibly to the external pathway, but over time contributes more from the ingrowth of radium-226 and its strong gamma-emitting progeny. Long-lived radium-226 progeny (i.e., lead-210 through polonium-210) were assumed to be in equilibrium with the initial radium-226 source term.

The ILCR estimates and dose rate predictions for the construction worker are based on exposure to total soil (weighted by relative surface and subsurface soil EPCs) and groundwater, whereas the estimates for all other receptors are based on exposure only to soils—surface and subsurface individually, but mainly surface (Section 6.2.3.2.1). However, total contributions of risk and dose to the construction worker from groundwater were negligible compared to those from soils (Tables 6-8 and 6-11). The estimated gross ILCR and dose to the construction worker due to exposure to groundwater (uranium isotopes) were 9E-10 and 2.0E-03 mrem/yr, respectively. After accounting for contributions from background radiation (approximately 24%), net ILCR and dose to the construction worker were 7E-10 and 1.6E-03 mrem/yr, respectively (Table 6-8).

Radium-226 was the radionuclide in surface and subsurface soils that contributed the vast majority ($\geq$ 88%) of the net ILCR and predicted effective radiological dose rate for present baseline conditions (year 0) for all receptors except adolescent trespassers. For the industrial worker, for example, radium-226 was responsible for 98% of ILCR (71% and 27% from surface and subsurface soils, respectively); lead-210 in surface soil (assumed to be at equilibrium with the initial radium-226 source) was responsible for the remaining 2% of ILCR. Similarly, radium-226 was responsible for 96% of predicted dose (70% and 26% from surface and subsurface soils, respectively), with lead-210 in surface soil contributing 4%. These relative radionuclide contribution results at year 0 were very similar for other receptors (Tables 6-9 through 6-13). For adolescent trespassers, lead-210 was responsible for 37% of ILCR and 32% of annual dose (Table 6-12). This comparatively greater effect of lead-210 for juvenile trespassers is due to the game meat ingestion pathway, which is similarly potent among lead-210 and radium-226 (which are assumed to be in equilibrium). This effect is weaker for adult trespassers, however, again due to the smaller ingestion dose coefficients for that age group.

The radiological effects of radium-226 (both dose and cancer risk) for all potential worker receptors at year 0 are almost completely ($\geq$ 98%) a result of the external gamma radiation exposure pathway rather than internal (inhalation or ingestion) pathways (Tables 6-9 through 6-11). This was also the case for other minor contributing radionuclides, except lead-210 and uranium-234 which were instead dominated by the internal pathways, but which contributed very minor radiological risk and dose overall. This is because lead-210 only emits a weak low energy gamma (46.5 kiloelectron volts) and uranium-234 is an alpha emitter with no short-lived immediate progeny.

The external pathway overall was not as dominant for construction workers and trespassers. For construction workers, this was due to greater soil ingestion, which produces additional risk and dose from lead-210 (which itself is assumed to be in equilibrium with radium-226). For trespassers, this

was due to minor but non-negligible contributions from ingestion of game meat. This was especially true for dose to adolescent trespassers (85% of annual net dose associated with radium-226 from game meat; 90% of total annual net dose from game meat) because the age-dependent radium-226 dose coefficient for ingestion was more than five times greater for the adolescent than for the adult trespasser, whereas the external dose coefficient (sourced from ICRP 60) was equal among the trespasser ages[13]. This age effect occurred similarly for the soil ingestion pathway—based on the same ingestion dose coefficients—but was less pronounced due to the overall smaller doses resulting from soil ingestion compared to game meat ingestion.

Notably, the greater dose from game meat ingestion is partially a result of greater input from the subsurface soil source term—game meat ingestion was the only exposure pathway for which radiological dose was greater from subsurface soil than from surface soil at year 0. This was due to the greater EPCs in the subsurface, which factor into the game meat pathway via plant rooting depth for fodder (0.9 m, extending into the subsurface soil horizon). Subsurface EPCs also factor into the external pathway, but because of shielding do not produce doses at year 0 greater than those produced by the lesser surface soil EPCs. The subsurface EPCs have only negligible contributions for the inhalation and soil ingestion pathways, as these pathways receive radiation from the subsurface only as the surface layer begins to erode (0.00006 m/yr or 0.0002 ft/yr) and the mixing zone (0.15 m or 0.49 ft) for direct exposures begins to down-blend into the subsurface soil horizon (Appendix G soil mixing layer figures). Construction workers are the only receptor other than trespassers that have significant non-external exposure to the subsurface at year 0, due to the intrusive subsurface activities they are assumed to engage in, which was modeled by the total soil weighted EPCs.

6.2.6 Uncertainty

The risk assessment process integrated a wide array of parameters and assumptions to produce quantitative estimates of risk, with each parameter introducing uncertainty into the overall assessment. These uncertainties can be parsed out by component of the risk assessment and evaluated individually in terms of their potential impact on the final conclusions and to identify which components may warrant further consideration. The cumulative uncertainty is also evaluated to provide an understanding of the relative range of potential error in the risk assessment quantification process (i.e. under- or -over-estimation of risks).

6.2.6.1 Identification of ROPCs

The selection of ROPCs relied on comparison of concentrations on site to concentrations representative of background. This consisted of comparing both central tendency (e.g. median) and upper-end values between the site and background distributions of radionuclide activity concentrations. The central tendency comparison used a standard statistical test and a 5% probability threshold ($\alpha = 0.05$) that a site sample distribution observed to exceed a background distribution could have resulted from a site population distribution that is not stochastically greater than background. In other words, a radionuclide with a site median greater than the background median was included as an ROPC only if the difference between medians was large enough such that the site median could have been produced with < 5% probability by sampling the background distribution. This placed the statistical burden of proof on a radionuclide site distribution being sufficiently elevated in order to conclude it was an ROPC (i.e. a site distribution incorrectly concluded to be equal to the background distribution was a Type II error). However, sample sizes were large for site soils data (88 and 177 for surface and subsurface, respectively, though just 15 for

[13] The inhalation dose coefficients also varied by age, but was only ~5% greater for adolescents, and the assumed inhalation rate for adults was ~3% greater than for adolescents (Table 6-6).

each in the background dataset), which provides robust statistical power to distinguish relatively minor differences among the distributions (i.e. the probability of Type II errors is reduced).[14] Moreover, because risk and dose contributions from natural background radiation were subsequently parsed out (Section 6.2.5.1), retaining radionuclides that are minimally greater than background as ROPCs would have negligible impact on the ultimate risk and dose conclusions made here. Groundwater and surface water had substantially fewer samples (3 and 6 for site groundwater and surface water, respectively), but the redundancy associated with the secondary upper-end statistical comparison would mitigate any inability to distinguish site from background medians.

The upper-end comparison used 95% upper confidence limits on the empirical or modeled 95th percentile of site and background distributions (UTL_{95-95}). These used multiple parametric and non-parametric estimations. Both site and background upper-end values selected for comparison were the lesser of the maximum observed value and the estimated UTL_{95-95}. Selecting the lesser of these values is conservative for identifying the background threshold, but not for identifying the upper end of the site distribution for comparison. However, using a maximum observation as an upper-end background value (i.e. the BTV) is excessive when sample size is low (n = 15 for soil, 24 for groundwater, and 10 for surface water). With so few samples, there is no expectation to have observed the 95th percentile, which bears out in the selected values where almost all BTVs ended up being the maximum observed value rather than the estimated UTL_{95-95} (Table 6-1). Artificially truncating the background distribution based on small sample size in this way resulted in considerable conservatism for the upper-end comparison of site and background distributions. Two radionuclides associated with the thorium-232 decay chain (radium-228 and thorium-228) were not identified as ROPCs despite having site UTLs exceed BTVs (in soils for radium-228 and in surface water for thorium-228) (Table 6-4). Based on site history, the presence of AEC-related contamination from these radionuclides would be contingent on coincident contamination from the thorium-232 decay chain, which was not observed by this remedial investigation. The short half-lives of radium-228 (5.75 years) and its immediate progeny, actinium-228 (6 hours), would also couple radium-228 to the presence of thorium-228 (half-life of 1.9 years) if it were still present from MED/AEC activities, but these radionuclides were not observed to be elevated together in environmental media on site. These sampling anomalies were likely a result of the considerable conservatism associated with the selection of BTVs described above.

Some risk assessments screen for constituents of potential concern based on detected concentrations, with the precondition that laboratory detection limits are lower than screening levels. Potential contaminants are also sometimes analyzed that do not have corresponding screening levels or toxicity criteria available for use in the risk assessment. These two potential sources of considerable uncertainty were not issues for this risk assessment, which evaluated only radionuclides identified for the overall remedial investigation, all of which had corresponding toxicity criteria. This made quantitative analysis possible using all validated radioactivity concentrations reported by the laboratory—regardless of minimum detectable activities (MDA) (Section 6.2.3.5). The sample-specific MDA is typically the amount of radioactivity that would be detected by the laboratory 95% of the time (NRC 2004)—i.e. a 5% false negative rate. In this way, the MDA in radiochemistry is more analogous to a practical quantitation limit in stable chemistry (often signified by a "J" qualifier for estimated detected values). There is therefore minor uncertainty in using results reported as less than the MDA in the quantitative analyses of the risk assessment.

[14] For example, a two-sample, one-sided t-test with equal sample sizes (n = 15), equal variance, and a mean difference equal to one standard deviation has a power of 0.85; whereas if the sample sizes are 15 and 88, power increases to 0.96.

The screening for chemicals of potential concern—limited to uranium based on known AEC-related constituents and known chemical effects of such radionuclides—was based on a target hazard quotient of one (unity). When generating screening levels, this target hazard quotient was divided evenly among the two environmental media to which receptors could be exposed to site-related uranium—soils and groundwater (HQ = 0.5 for each). This division presented the possibility that a medium without uranium concentrations greater than the screening level would have to be reconsidered and incorporated into a combined total receptor exposure if the other medium did have exceedances of its screening level. This was not the case, however, as neither medium had exceedances. In addition, industrial exposure screening levels were not readily available for groundwater (USEPA 2022a) so residential assumptions were used instead, which provided a conservative screening for uranium as a chemical of potential concern in groundwater.

Overall, the process of identifying ROPCs was conservative, and uncertainty was minimized through consideration of issues specific to this risk assessment (e.g. exclusion of thorium-232 decay chain radionuclides based on known AEC contaminant processes, and inclusion of radionuclide laboratory measurements less than the MDA).

6.2.6.2 Exposure Assessment

There can be considerable uncertainties associated with exposure parameters, as several have limited data upon which estimates are based (e.g. ingestion rates, inhalation rates, particulate emission factors). Some of these uncertainties are described in Section 6.2.3.4 where it is detailed how parameter values were selected, and additional rationales are provided in Table 6-6. In general, default values available from Argonne National Laboratory (Yu et al. 2015a, ANL 2016a, Kamboj et al. 2018), USEPA (2011a, 2014a), and USACE (2002b) were selected, which afford sufficient conservatism in that they are designed to construct the RME scenario.

Some key parameters with high uncertainty include the soil ingestion rates and water ingestion rates, about which there are limited studies. The soil ingestion rate for industrial workers was set to 100 mg/d for the one hour they were assumed to be outdoors, and 50 mg/d for the seven hours they were assumed to be indoors under a potential future exposure scenario. The value for indoor exposures is based on two studies (USEPA 1991a Attachment B), one which measured 50 mg/d for adults (n = 6) exposed in a typical indoor workplace (Calabrese et al. 1990), and one which modeled between 0.5 and 110 mg/d for adults exposed via household activities (Hawley 1985). The value for outdoor workers and maintenance workers (100 mg/d) was set equal to an assumed value previously established for adults experiencing combined exposures to outdoor soil and indoor dust (USEPA 1989), which was corroborated by the same study of adults (Calabrese et al. 1990) as a presumed upper bound value (USEPA 1991a, USEPA 2014a). Both adolescent and adult recreational users or trespassers were similarly assumed to ingest 100 mg of soil per day, based on the default RME rate for residents. Construction workers were assumed to ingest 330 mg of soil per day (USEPA 2002a), based on an upper bound values (95^{th} percentile) established by a mass balance study of adult soil intake rates (Stanek et al. 1997). This value replaced the previous default value for outdoor physical activities (480 mg/d) that was based on the same exposure modeling study described above (Hawley 1985).

There are thus considerable uncertainties for each of the soil ingestion rates, but no further guidance on estimates is available. The USEPA (2011a) Exposure Factors Handbook, for example, only provides central tendency values for adult residents (20 and 50 mg/d for soil only and soil plus indoor dust, respectively). The ingestion pathway, however, was of minimal importance for overall risk and dose estimates (Section 6.2.5.2). Construction workers were the receptor for which the soil ingestion rate was most important, and the value selected for that parameter (330 mg/d) is an empirical 95^{th} percentile value, appropriate for use in a RME exposure scenario.

The groundwater ingestion rate for construction workers (2.5 mL/d)—the only receptor exposed to groundwater—was set to 0.1% of the default residential ingestion rate for tapwater, based on professional judgement for incidental ingestion during intrusive subsurface activities. This value coincides with a reported estimate for mean adult water ingestion rate during recreational wading in surface waters (3.7 mL/hr, upper confidence limit of 11.2 mL/hr) (USEPA 2011a, Dorevitch et al. 2011).[15] Although construction workers could be exposed to groundwater for multiple hours during the workday, and thus exceed the estimate for wading, it is unlikely that partially submerged work activities resembling recreational wading would occur for extended or repeated periods. Moreover, groundwater ingestion contributed negligible risk and dose overall (Table 6-8), indicating that even order of magnitude excesses in estimated groundwater ingestion rates would not materially affect the overall results or conclusions.

The other exposure parameter set based on professional judgement was game meat ingestion for adolescent and adult recreators, which was assumed to be 50 lbs of venison per year based on one buck harvested from the site per year. The Exposure Factors Handbook (USEPA 2011a) does not provide any guidance on this parameter. However, assuming even one buck per year is likely an overestimate of exposure given the size of the site (4 acres) compared to the typical home range of the native white-tailed deer in fragmented forest–agricultural landscapes of New York (571 ± 403 acres [mean ± standard deviation]) (Dechen Quinn et al. 2013). Even in highly fragmented, suburban and exurban landscapes, home ranges are likely to be an order of magnitude greater than the size of the VP H' site (Dechen Quinn et al. 2013). This disparity would affect both the likelihood of the site receptors modeled in this risk assessment harvesting a deer from the site, and the exposure the deer would have to residual site contamination via its forage base. On the other hand, the RESRAD model quantifies contaminated meat intake by considering the fraction of overall meat intake that is sourced from the site, which was assumed to be 0.223 and 0.162 for adolescent and adult trespassers, respectively (Table 6-6), based on the 95th percentile of their overall meat consumption (USEPA 2011a). Basing the contaminated fraction on an upper percentile rather than the mean overall meat consumption is not a conservative assumption; however, it may be appropriate to assume that hunters consuming game meat are also likely to consume more meat overall than the average member of the population. On balance, the estimated dose from the game meat consumption pathway is likely to be overestimated.

Another uncertain exposure parameter which is key to estimating lifetime cancer risks—but not non-cancer hazard or radiological dose rates—is exposure duration, which was assumed to be 26 years for recreational receptors (combined adolescent and adult) (Table 6-6) based on current guidance for residential occupancy (USEPA 2014a). A residential-based exposure duration may underestimate recreational exposure duration, as people may move their residence locally while continuing to recreate in the same areas. As the intake equations are multiples of exposure duration (Section 6.2.5.1)—allowing for minor differences based on radiological ingrowth—any additional exposure duration would proportionally increase the risk and dose estimates. For example, if a RME duration for site recreators was up to 30 years, risk estimates would increase by approximately 15%. Any such potential underestimates would likely be mitigated, however, by the very localized nature of the VP H' site (4 acres), which would not present a regionally-important recreational attraction.

Section 6.2.3.2.2 described that receptors were assumed to experience dermal exposure, but that it was an unquantifiable exposure route for radionuclides, including uranium. No dermal cancer slope factors have been developed for radionuclides, but it is generally understood that the dermal exposure route produces negligible radiological risk compared to ingestion, inhalation, and external

[15] Note there is an error in USEPA (2011a) where the UCL is reported as 1.0, while the original source (Dorevitch et al. 2011) reported 11.2.

gamma exposures (USACE 2002b, ANL 2007). Similarly for evaluating chemical exposures, insufficient information exists about the absorption efficiency of uranium through skin, precluding the use of any default value (USEPA 2004). Some risk assessors may choose to quantify dermal absorption from soil despite the uncertainties. For example, USEPA Region 3 guidance does provide for an assumption of a default absorption factor of 0.01 for metals (USEPA 1995 and online updates[16]), which would enable the quantification of dermal absorption for uranium. This would produce a small dermally absorbed dose, however, which would not be substantial relative to a dose associated with ingestion of uranium from soil.

Lastly, there is some uncertainty about the relative exposures modeled for surface and subsurface soils. The RESRAD default 0.15 m soil mixing layer (Table 6-6) was used, which determines the contribution of soil to the dust inhalation and soil ingestion pathways (Kamboj et al. 2018). This is likely a conservative estimation of mixing for soils at the VP H' site under current conditions, which consists mainly of natural vegetation, which may have produced minor overestimation of risk and dose. The fact that the mixing layer depth equaled the surface soil exposure depth resulted in the gradual down-blending of the mixing zone into the subsurface via erosion (see soil mixing layer figures in Appendix G). This contribution from the greater subsurface EPCs was negligible for early years, but more substantial for later years (Section 6.2.5.2). For example, 40% of internal exposure would occur via the subsurface EPCs by year 1,000, whereas no internal exposure would occur via the subsurface if the mixing zone were just half as thick.

Construction workers were assumed to predominantly (90%) have exposure to the subsurface soils for the entire exposure period. This was based on the 0.5 m depth of the surface soil layer and 5 m depth of the overall soil source term being modeled. Although construction workers are often assumed to have exposure to soil 3 m bgs, soils data below 5 m were not available, and no uncontaminated soil was assumed to be mixed in with the radiological source term. Although this delineation may provide conservatism to the estimated construction worker risks, exposure to the upper soil profile (0 to 1.5 m bgs) is more likely than exposure to the lower soil profile (1.5 m to 3 m bgs).

Overall, the process of estimating exposure used RME values which are inherently conservative, and the uncertainty evaluation demonstrated that this conservatism was maintained through the exposure assessment. The internal pathway parameters contain considerable uncertainty, but these pathways were of minimal importance for overall risk and dose estimates. Similarly, the uncertainty about potential dermal exposure—which was left unquantified in this risk assessment—would constitute only a minor fraction of overall exposure. The overall small area of the VP H' site (4 acres) mitigates uncertainty related to other exposure parameters (e.g. exposure duration and game meat ingestion).

6.2.6.3 Toxicity Assessment

All toxicity criteria used in a risk assessment have uncertainty associated with them. This is usually quantified in terms of uncertainty factors of orders of magnitude applied to toxicology-based point estimates to generate human health-based reference doses or cancer slope factors. Despite such uncertainties, the criteria generally represent the best available estimates (USEPA 2003a) that incorporate appropriate factors of safety for the protection of human health.

The chemical screening for uranium was based on the RfD_o available from IRIS (3E-03 mg/kg-day). A newer, alternative RfD_o for uranium (2E-04 mg/kg-day)—based on the same critical effect of kidney toxicity—is available based on the minimal risk level (MRL) reported by the Agency for

[16] https://www.epa.gov/risk/updated-dermal-exposure-assessment-guidance

Toxic Substances and Disease Registry (ATSDR 2013). However, this MRL would be considered a Tier III toxicity source under the hierarchy for toxicity values in CERCLA risk assessments established in USEPA (2003a) and USACE (2016b), whereas the IRIS RfD_o represents a Tier I toxicity source that generally supersedes the Tier III source under the hierarchy. The hierarchy does provide for consideration of more recent, credibly, and relevant toxicity information, and the USPEA (2016a) Office of Superfund Remediation and Technology Innovation has recommended using the MRL in its Superfund program. However, deviation from a Tier I toxicity source under this hierarchy would require case-by-case consideration and best scientific judgement by an implementing agency, and neither the Department of Defense nor USACE have provided formal recommendations regarding deviation from IRIS in this case.

The cancer slope factors employed in this risk assessment were for radionuclides, estimating the radiogenic cancer risk associated with exposure to residual radiological contamination in site media. These are radionuclide-specific risk coefficients estimating risk per unit of radioactivity. They were sourced from FGR 13 (Eckerman et al. 1999), which has some uncertainties due to updated radiogenic cancer risk models (USEPA 2011b) that have yet to be incorporated into potential updates to FGR 13. Alternative risk coefficients for the soil ingestion pathway are available from USEPA's (2001) radionuclide table. FGR 13 published ingestion coefficients only for tap water and dietary ingestion (food), the latter of which were used in this risk assessment for soil ingestion. The risk coefficients specific to soil ingestion published by USEPA (2001) for radium-226—the predominant radionuclide producing cancer risk via soil ingestion—is greater than the corresponding food ingestion coefficient by a factor of 1.4. Use of the soil-specific coefficients would therefore increase overall cancer risk estimates associated with exposure to radionuclides in site soils. As described above, however, the ingestion pathway overall was responsible for minimal risk and dose. The soil ingestion coefficients were derived using the same methodologies, risk models, and vital statistics used in FGR 13 to derive the food ingestion coefficients (USEPA 2015) and thus do not constitute substantially more robust toxicity criteria.

Radionuclide-specific dose coefficients were used to estimate biologically effective dose per unit of radioactivity exposure incurred by receptors. These were derived based on ICRP (1991) methodologies, with age-dependent ingestion and inhalation coefficients available from ICRP (1996) and age-dependent external coefficients derived within RESRAD. More recent age-dependent external dose coefficients were published in FGR 15 (Bellamy et al. 2019) for six age groups and seven exposure scenarios. The latest version of RESRAD-ONSITE (v. 7.2) (ANL 2016a, 2018) does not at this time include the external coefficients from FGR 15. Those coefficients were published based on the dosimetry methodologies of ICRP (2007) publication No. 103, which has yet to be applied by any federal agency in radiation protection regulations (Bellamy et al. 2019).

6.2.6.4 Risk Characterization

Uncertainties associated with the overall risk characterization are the combined result of uncertainties for each individual step of the risk assessment process, as detailed above. In partial recognition of this higher-level uncertainty, final ILCR estimates were reported to one significant figure when comparing to the risk management range for cancer risk (1E-04 to 1E-06), and final dose estimates were reported to two significant figures when comparing to the NRC dose criterion (25 mrem/yr). Such coarse evaluation of estimated risks is generally consistent with the less than order-of-magnitude uncertainties associated with many of the key parameters.

Risks and doses were quantified using RESRAD-ONSITE software, which uses code to model radiological activities, nuclear decay and transformations, dosimetric calculations, and exposures to environmental media over time (1,000 years). These models are well-researched and peer-reviewed, including through validation with independent data and benchmarking against similar codes (Yu et

al. 2015b, and detailed in Yu et al. 2001). However, to quantify dose from groundwater exposures—incidental ingestion for construction workers only—simple analytical estimations were used that incorporated only the relevant exposure parameters and dose coefficients, with no incorporation of radioactive decay and ingrowth, erosion, or leaching. This method introduces more uncertainty for the groundwater pathway compared to the other pathways quantified with RESRAD, including a lack of results over the 1,000-year evaluation period modeled for the other pathways. Baseline condition results were very similar overall to year 1,000 results, however, and risk and dose to the construction worker attributable to groundwater were negligible compared to those attributable to soils (Section 6.2.5.2).

Risk characterization was performed using both gross and net EPCs (Section 6.2.5.1), with conclusions based primarily on the net results, which constitute the risk and dose attributable only to AEC-related contamination. Radiological dose assessment explicitly considers only the dose above natural background (NRC 1994, 2001, 2006a,b), whereas the standard CERCLA risk assessment process addresses background contributions after risk quantification (USEPA 2002b Appendix B). After overall quantification, it is recommended to similarly quantify and distinguish background contributions. Therefore, quantifying both gross and net results provides direct comparability for how both radiological dose and cancer risk are evaluated. Drawing conclusions about radiological cancer risk on net results is consistent with USEPA (2002b, 2014b) and USACE (2011b) guidance.

6.2.6.5 Summary of Uncertainty

This HHRA overall implemented many assumptions based on USEPA guidance (e.g. USEPA 1989, 2003a, 2004, 2011a, 2014a) and ANL guidance (Yu et al. 2015a, ANL 2016a, Kamboj et al. 2018) guidance, which are generally intended to introduce considerable conservatism into the subsequent risk estimates. Likewise, the uncertainty factors built in to the toxicity criteria used for quantifying risks and doses tend to provide critical factors of safety with respect to predicting health outcomes for humans exposures to environmental contaminants.

Additional sources of uncertainty more specific to this HHRA that were reviewed include:

- Identification of ROPCs (Section 6.2.6.1)—Statistical comparisons to background, radionuclide decay chains to distinguish AEC-related ROPCs, and probability distributions of radionuclide laboratory measurements and false negatives.
- Exposure Assessment (Section 6.2.6.2)—Soil, water, and game meat ingestion rates, exposure duration and site occupancy, dermal exposure quantifiability, and the relative exposures modeled for surface and subsurface soils.
- Toxicity Assessment (Section 6.2.6.3)—Oral reference dose for uranium chemical toxicity, cancer slope factors employed for the soil ingestion pathway, and age-dependent dose coefficients.
- Risk Characterization (Section 6.2.6.4)—RESRAD code and analytical equations for the groundwater exposure pathway, and the use of both gross and net EPCs for quantifying risk and dose.

Overall, the parameters with the greatest uncertainty were associated with the non-dominant exposure pathways. The evaluation of these various sources of uncertainty revealed that, on balance, the point estimates of total risk and dose are more likely to have overestimated risk than to have underestimated risk.

6.2.7 Summary of Human Health Risk Assessment

Eight radionuclides were evaluated as potential site contaminants and for the potential for posing human health risks. Concentrations of these radionuclides were evaluated in four environmental media—surface soil, subsurface soil, groundwater, and surface (ponded) water. An initial

comparison of radionuclide concentrations on site to concentrations representative of background identified five ROPCs in soil (both surface and subsurface soil), three ROPCs in groundwater, and no ROPCs in surface water.

The cancer risks and radiological doses resulting from exposure to these ROPCs were quantified for human receptors identified as potentially using the site under current and foreseeable future industrial land use. The non-cancer hazard associated with chemical toxicity of uranium isotopes was also evaluated, but the hazard was not quantified because total uranium concentrations were less than screening levels for soil and groundwater. The evaluated receptors were an industrial worker, maintenance worker, construction worker, and trespasser/recreator (adult and adolescent).

Under the assumption of current and future industrial land use, no receptor was estimated to be subject to unacceptable incremental lifetime cancer risk (1E-04), radiological dose (25 mrem/year), or chemical hazard (HQ > 1) due to combined exposure to site environmental media. The maximum receptor net ILCR was 5E-05 and the maximum receptor net dose was 16 mrem/yr (Table 6-14). Receptor chemical hazard quotients were not calculated because uranium was screened out as a chemical of potential concern for all environmental media, using screening levels based on target HQs of 0.5. The unacceptability thresholds are based on USEPA (1989, 1991b,c) guidance for risk assessments under CERCLA and Nuclear Regulatory Commission (NRC 2001, 2006a,b) radiological dose standards for license termination with unrestricted release. Therefore, no ROPCs were identified as radionuclides of concern requiring further evaluation or action to prevent unacceptable impacts to human health.

6.3 Ecological Risk Assessment

6.3.1 Introduction

An ecological risk assessment was conducted to evaluate the potential for adverse impacts to populations of plants or animals resulting from exposure to site contaminants. This began with a screening-level ecological risk assessment, which formulates the problem to be evaluated, describes the ecological resources available on site, and identifies the generic populations of ecological receptors (plants or animals) using those resources. It then uses chemical data for environmental media on site to which such receptors may be exposed to determine whether more detailed evaluation and characterization of risk is required.

The problem formulation includes a description of the environmental setting (site natural features and habitats) and defines the assessment endpoints for the evaluation. Radionuclides of potential ecological concern (ROPECs) were then identified by screening ROPC and related chemical (total uranium) concentrations against ecological screening values for particular environmental media that are considered protective of ecological receptor populations. Results of the screening evaluation provide the information required to conclude whether ecological risks at the site are negligible or further evaluation is necessary to provide fuller characterization of potential ecological risks.

6.3.2 Problem Formulation & Environmental Setting

The VP H' site covers an area of approximately 1.6 hectares (4 acres) zoned for industrial land use and is adjacent to existing industrial operations. The site consists mainly of natural vegetation on historically-disturbed land with areas of current industrial impact (e.g., storage and industrial debris). The vegetation includes old field habitat with grasses and shrubs and early successional hardwood forest. Surface water features on the site are limited to localized areas of surface ponding from precipitation. No persistent viable aquatic habitat is present, and any organisms utilizing surface water on site would be doing so intermittently as a supplemental resource for either drinking

water, foraging, or rest. No federal- or state-listed threatened, endangered, or rare species are known to be present on or utilize the site, nor are there any wetlands or significant natural communities.[17] Groundwater is not considered a potential exposure medium for ecological receptors because no complete exposure pathway to groundwater has been identified.

The northern two thirds of the site correspond to EU 1 of the ecological risk assessment for the former Lake Ontario Ordnance Works (LOOW), performed under the Defense Environmental Restoration Program for Formerly Used Defense Sites (EA 2008). The portion of LOOW EU 1 that includes the VP H' site was characterized at the time as being 50% old field and 5% wooded, with the remainder being buildings and debris. The wooded proportion of that area has since increased, but the habitat types generally remain the same. At the time of the LOOW evaluation, no rare or endangered species or sensitive habitats were identified by the New York State Department of Environmental Conservation or the U.S. Fish and Wildlife Service as being potentially present on site (EA 2008). The southern third of the VP H' site—which is not encompassed by LOOW EU 1—includes similar natural features as well as disturbed land used for current industrial purposes such as the onsite air monitoring station used by CWM.

The site proper is not likely to support sufficiently large populations of ecological receptors to warrant an ecological risk assessment. However, the site is surrounded by larger tracts of natural vegetation, potentially providing sufficient habitat in conjunction with other NFSS vicinity properties and other properties to the north and west. Ecological receptors inhabiting the area would likely have either limited exposure to the site (those with larger home ranges) or receptor populations would experience minimal impact from any potential site contamination (those populations whose individuals have smaller home ranges or fully inhabit the site). The screening-level evaluation was therefore intended to confirm that populations of organisms potentially utilizing the natural features of the site would not likely be adversely impacted by radionuclides present on site above background levels. The assessment endpoints evaluated were populations of plant or animal receptors with individuals potentially exposed to site contaminants. No other assessment endpoints were identified because no rare, threatened, or endangered species have been identified as present on site, nor are there sensitive, unique, or critical habitats or natural features. Ecological screening values were therefore identified that provide protection at the population level.

6.3.3 Identification of Radionuclides of Potential Ecological Concern

Radionuclides of potential ecological concern (ROPECs) were identified by comparing site radionuclide concentrations to ecological screening values. Only radionuclides identified as ROPCs in the HHRA based on comparison to background concentrations (Section 6.2.2.2; Table 6-4) were screened for consideration as ROPECs. This consisted of radium-226, thorium-230, uranium-234, uranium-235, and uranium-238 in surface and subsurface soils. Total uranium was additionally screened for potential chemical toxicity to ecological receptors.

6.3.3.1 Identification of Ecological Screening Values

Radiological Screening:
Screening values for radionuclides that are considered protective of ecological receptor populations were obtained from U.S. Department of Energy standards (USDOE 2002, 2019). These were generic biota concentration guides (BCGs) for environmental media, including water, sediment, and soil. The BCGs are part of a graded approach for evaluating radiation doses to aquatic and

[17] As determined using the New York State Department of Environmental Conservation Environmental Resource Mapper (https://gisservices.dec.ny.gov/gis/erm/) and the New York Natural Heritage Program Nature Explorer (http://www.dec.ny.gov/natureexplorer/app).

terrestrial biota, which is consistent with the standard USEPA (1997) ecological risk assessment paradigm and implemented as part of the RESRAD-BIOTA (Yu et al. 2003, USDOE 2004, ANL 2016b) software package for modeling radiological doses to ecological receptors. Comparison of radionuclide concentrations in environmental media to BCGs is considered step one in a RESRAD-BIOTA evaluation.

The BCGs are based on standard dose evaluation methods and biota dose rate criteria (average absorbed dose rates) demonstrated to be protective of populations of plants and animals exposed to ionizing radiation (Higley et al. 2002, ICRP 2014, USDOE 2019). Internal doses in this framework were calculated as the product of contaminant concentration in the given environmental medium, organism-specific bioaccumulation factors, and dose conversion factors. External doses were calculated based on the assumption of immersion of the organism in soil, sediment, or water. The assumptions and default parameters used provide for conservative screening values (Higley et al. 2002).

The dose rate criteria on which BCGs are based were determined for the following groups of organisms: aquatic animals (≤ 1 rad/d), riparian animals (≤ 0.1 rad/d), terrestrial plants (≤ 1 rad/d), and terrestrial animals (≤ 0.1 rad/d). A rad is a physical deterministic quantity of absorbed radiation dose (1 rad = 0.01 J/kg). Dose rates in this context are predicted as absorbed doses rather than as the biologically effective doses (rem) evaluated for stochastic effects in the HHRA (Section 6.2.4). The absorbed dose metric is more straightforward in evaluating the deterministic acute effects to irradiated tissues of organisms, whereas the effective dose rates evaluated stochastic health effects for humans such as cancers and genetic effects. However, the dose rate criteria are based on ranges of dose identified by ICRP (2014) as potentially resulting in deleterious effects to the organism. As such, there remains uncertainty with the absorbed dose metric for deterministic effects and the biota dose rate criteria may not be definitively protective of individual effects. The criteria were derived from dose-response data for the most radiosensitive species and life stages studied, but are meant to be protective of populations rather than individuals (USDOE 2019). Using the graded approach (beginning with BCGs to screen environmental media for ROPCs) enables for a determination of whether radionuclide concentrations are likely to result in doses in excess of the identified dose rate criteria and therefore have the potential to impact populations of ecological receptors (USDOE 2019).

In order to evaluate whether the dose rate criteria would be exceeded for a receptor in either a terrestrial or aquatic environment, the total dose received from all ROPCs in all environmental media that the receptor might be exposed to must be considered. As such, the evaluation sums the ratios of each ROPC's concentration in a given medium to the corresponding BCG. To evaluate potential terrestrial receptors, the ratios were summed across ROPCs in surface and subsurface soils, assuming that some terrestrial receptors may have direct exposure to soils down to 2 ft bgs. To evaluate potential aquatic receptors, the ratios were summed across ROPCs only in surface soil, assuming that surface soil would serve as the sediment substrate for any aquatic receptors potentially inhabiting ponded surface water on the site. A sum of the ratios exceeding one (unity) for a given terrestrial or aquatic evaluation would indicate the potential for deleterious effects to a population of organisms in the given environment.

Chemical Screening:
Uranium isotopes in soil were the only ROPCs identified based on comparison to background concentrations (Section 6.2.2.2; Table 6-4) that present corresponding chemical hazard for ecological receptors. Total uranium (mass concentrations rather than activity concentrations) was therefore identified as a potential soil contaminant and screened for chemical toxicity using ecological screening values.

The most current source compositing available ecological screening values is the USEPA (2018) Region 4 Ecological Risk Assessment Supplemental Guidance. This guidance incorporates a variety of sources for ecological screening values, including the USEPA (2003b) Ecological Soil Screening Levels, Oak Ridge National Laboratory publications (Efroymson et al. 1997a,b,c), and the Los Alamos National Lab (LANL 2017) ECORISK database (v. 4.1).

The screening values identified for total uranium in soil (25 mg/kg) and freshwater sediment (100 mg/kg) are sourced from the ECORISK database. These values are based on terrestrial plants and aquatic community organisms (for soil and sediment, respectively) as limiting receptors—those receptors protective of all other organism types evaluated, including birds and mammals (Sheppard et al. 2005). Both are considered predicted no effect concentrations, adjusted downward by an uncertainty factor of 10 from geometric mean lowest observed effect concentrations (LANL 2017).

6.3.3.2 Screening Results

No BCGs were available for thorium-230 in soil or sediment. Isotopic uranium concentrations in surface soil, subsurface soil, and sediment were less than 1% of their respective BCGs (Table 6-15). Likewise, the derived maximum concentration of total uranium mass in surface soil (12.19 mg/kg) was less than both the soil and sediment total uranium screening values for the protection of ecological receptors (Table 6-16). Uranium in soil is therefore predicted to have no observed toxic chemical effect on either terrestrial or aquatic organisms.

The maximum concentration of radium-226 in surface soil (22.64 pCi/g) was 45% of the soil BCG for terrestrial receptors, and 23% of the sediment BCG for aquatic receptors (Table 6-15). The sum of ratios using surface soil concentrations were 0.46 and 0.23 for the terrestrial and aquatic system evaluations, respectively (Table 6-15). As such, harmful effects due to radiological dose are not expected for populations of aquatic organisms exposed to surface soil serving as a sediment substrate, or terrestrial organisms exposed only to surface soil.

The maximum concentration of radium-226 in subsurface soil (155.20 pCi/g) exceeded the soil BCG for terrestrial receptors by a factor of 3.1. Summing this exceedance with that for surface soil (assuming combined surface and subsurface soil exposure) produced a sum of ratios for terrestrial receptors of 3.57 (Table 6-15). This exceedance of unity, however, occurs for only two of 267 total soil samples (178 in the subsurface horizon)—i.e., all other soil sample results were less than the soil BCG (50 pCi/g) for terrestrial receptors. The two results exceeding the BCG (155.20 pCi/g at Hotspot 02 and 101.25 pCi/g at Hotspot 06) were both located at a depth of 0.5 to 1.5 ft bgs, within the soil horizon potentially encountered by burrowing animals and plant roots. In lieu of calculating a receptor-specific EPC for mobile burrowing animals, or a population-level mean EPC for point exposures of sessile organisms (e.g., plants), the distribution statistics of subsurface soil concentrations were examined to understand the potential for either terrestrial organism type to experience harmful effects at the population level.

The estimated values for both the sitewide mean (UCL_{95}, 7.33 pCi/g) and the 95th percentile ($UTL_{95\text{-}95}$, 6.09 pCi/g) of radium-226 in subsurface soil are dramatically less than both subsurface soil samples exceeding the BCG, and are themselves no more than 15% of the BCG (Table 6-15). Note that the greater value for UCL_{95} than for $UTL_{95\text{-}95}$ is due to a highly skewed distribution (skewness = 9.8) and a potential estimation anomaly resulting from the non-parametric methodologies used. The $UTL_{95\text{-}95}$ value is based on order statistics, with the selected value (6.09 pCi/g) representing the 173rd greatest value of the 178 subsurface soil sample results, and the confidence coefficient achieved by this UTL was only 0.88 rather than the target 0.95

(Appendix F)[18]. The UCL_{95} value was based on the Chebyshev inequality, which tends to be a stable but conservative estimation technique (Singh and Singh 2015), in this case exceeding a similarly non-parametric estimation of the $UTL_{95\text{-}95}$. Regardless of such a distribution or estimation anomaly, the main point is that less than 5% of the population of sitewide subsurface soil radium-226 concentrations—and none of the surface soil concentrations—are likely to exceed the BCG for terrestrial receptors.

The elevated radium-226 concentrations observed at Hotspots 02 and 06 appear very limited in their spatial extent, both horizontally and vertically. The elevated samples at both hotspots occurred in the 0.5 to 1.5 ft bgs interval, with radium-226 concentrations immediately above or below not observed to be greater than 22.6 pCi/g. Radium-226 concentrations observed in the Hotspot 01 soil boring, located within a few inches of the Hotspot 02 soil boring (Section 4.2), were no greater than 2.8 pCi/g. Similarly, radium-226 concentrations observed in the soil boring (C2-14) closest to Hotspot 06 (Figure 12) were no greater than 1.7 pCi/g. Additionally, gamma walkover survey count rates tend to drop off to background within close proximity to both biased sampling locations.

The limiting terrestrial receptors for the soil BCG are terrestrial animals, not plants which would experience point exposures only to the hotspot concentrations. BCGs were derived based on dose rate criteria that incorporate spatiotemporal averaging of exposures (USDOE 2019). Moreover, BCGs were also derived to be protective of the population of individual receptors potentially exposed. Given the considerations of potential receptor exposure and the distribution of radium-226 concentrations, it is unlikely that any population of terrestrial organisms would experience harmful effects due to radiological dose associated with exposure to site soils.

No ROPECs were identified because (a) maximum concentrations of ROPCs produced sums of ratios to BCGs less than one for aquatic systems (surface soil serving as a sediment substrate), (b) the maximum concentration of total uranium mass was less than the soil and sediment screening values for uranium chemical toxicity, and (c) less than 5% of sitewide soil is likely to have radium-226 concentrations greater than the soil BCG for terrestrial receptors.

6.3.4 Summary of Ecological Risk Assessment

The ecological resources afforded by the VP H' site are limited, consisting of less than 1.6 hectares (4 acres) of disturbed upland habitats (old field and hardwood forest). Prior investigations (EA 2008) provide concurrence on the limited nature of ecological resources and habitat features. The site is nevertheless situated within a mosaic of other properties providing larger tracts of similar habitats, presenting the possibility of site impacts on ecological receptors utilizing the site. An ecological risk assessment was therefore performed to evaluate whether populations of organisms potentially utilizing the natural features of the site would likely be negatively impacted by radionuclides present on site above background levels.

The ROPCs previously identified based on an exceedance of background concentrations were screened for their potential effects on ecological receptors. This consisted of five ROPCs in soil. The soil evaluation included a screening of total uranium for its corresponding chemical toxicity. Ecological screening values (BCGs) published by the USDOE (2019) for soil and sediment were used to evaluate both terrestrial and aquatic receptors. Despite the surface water features on site being limited to ponded water with no persistent aquatic habitat, concentrations of ROPCs (and total uranium) in surface soil were also screened against sediment BCGs as a conservative evaluation of the potential that aquatic receptors could be present on site and exposed to surface soil acting as a sediment substrate.

[18] A sample size of 208 was estimated to be required to achieve the target confidence.

The sum of the ratios of maximum ROPC concentrations to BCGs were less than one for aquatic systems (sediment). The sum of ratios was greater than one for terrestrial systems (soils), but further evaluation revealed that less than 5% of sitewide soil had radium-226 concentrations greater than the BCG. Lastly, the maximum concentration of total uranium was less than the soil and sediment screening values for uranium chemical toxicity. Therefore, no ROPECs were identified and no adverse impacts to ecological receptor populations are expected due to exposure to site-related contaminants. As such, no further characterization of potential ecological risks is necessary, and this screening-level evaluation concludes the ecological risk assessment for the site.

6.4 Summary of Risk Assessment

This baseline risk assessment included a human health risk assessment and an ecological risk assessment. Each risk assessment evaluated potential human or ecological receptor exposures to site contaminants and determined that no unacceptable adverse impacts to human health or the environment are likely to occur.

Eight radionuclides were evaluated as potential contaminants of concern in site surface soil, subsurface soil, groundwater, and surface (ponded) water. Those determined to be present in environmental media with concentration distributions exceeding background distributions were identified as ROPCs and evaluated for their potential to produce human health and ecological risks. Uranium-234, uranium-235, and uranium-238 were identified as ROPCs in surface soil, subsurface soil, and groundwater. Radium-226 and thorium-230 were identified as ROPCs in surface and subsurface soils.

The potential exposure of human and ecological receptors to these ROPCs was evaluated by assuming the entire 1.6-hectare (4-acre) site represented the exposure unit—the area over which receptor exposure would be spread. In the case of human receptors, this assumes that individuals would distribute their activities evenly across the site; for ecological receptors, sessile organisms or individuals with small home ranges may be more locally exposed, but this possibility was accommodated by the graded approach used in the ecological risk assessment that evaluated potential risk by first considering maximum concentrations, and then evaluating the distribution of radionuclide concentrations across the exposure unit.

The cancer risks and radiological doses resulting from exposure to the ROPCs were quantified for human receptors identified as potentially using the site under current and foreseeable future industrial land use. The non-cancer hazard associated with chemical toxicity of uranium isotopes was also evaluated, but hazard was not quantified because total uranium concentrations were less than screening levels for soil and groundwater. The evaluated receptors were an industrial worker, maintenance worker, construction worker, and trespasser/recreator (adult and adolescent).

Under the assumption of current and future industrial land use, no receptor was estimated to be subject to unacceptable incremental lifetime cancer risk (1E-04), radiological dose (25 mrem/year), or chemical hazard (HQ > 1) due to combined exposure to site environmental media (USEPA 1989, 1991b,c, NRC 2001, 2006a,b).

Populations of ecological receptors from either terrestrial or aquatic systems potentially present on site were not predicted to have combined exposure to ROPCs such that individuals would receive dose rates likely to result in adverse impacts to the population. Likewise, individual ecological receptors would not be exposed to concentrations of uranium isotopes such that adverse impacts would be predicted to be observed due to uranium chemical toxicity. There were therefore no ROPECs identified requiring further evaluation.

Overall, it was determined that neither human nor ecological receptors exposed to all ROPCs collectively would experience unacceptable risk such that no ROPCs were identified as radionuclides of concern requiring further evaluation or action to prevent unacceptable impacts to human health or the environment.

7 SUMMARY AND CONCLUSIONS

7.1 Summary

In 2016, USACE prepared a preliminary assessment of VP H' that concluded that historical activities, such as the storage and incineration of FUSRAP material, may have adversely impacted soil, concrete slabs/foundations, and other site media (USACE 2016a). The preliminary assessment recommended a remedial investigation, in accordance with CERCLA, to determine the nature and extent of AEC-related contamination and the associated risks to human health and the environment.

USACE designed this remedial investigation to identify the presence of contamination in surface and subsurface soil, groundwater, ponded water, and the concrete pad using both a systematic and biased approach to sample collection. Biased soil samples were based on the results of a gamma walkover survey of all accessible areas of the site.

Extensive sampling of the 1.6-hectare (4-acre) property included the advancement of 89 borings to 1.5 m (5 ft) below grade and collection of 267 soil samples; collection of three groundwater samples from existing wells, one on site and two downgradient and off site; collection of eight water samples (or ponded water samples) from low-lying areas; and advancement of two concrete borings and collection of three concrete samples. All samples were analyzed for radium-226, radium-228, isotopic thorium, and isotopic uranium. Water samples were also analyzed for water quality parameters such as alkalinity, total dissolved solids, and anions (e.g., bromide, chloride, fluoride, nitrite, nitrate, orthophosphate, and sulfate). Analytical data are presented in Tables 4-3 through 4-6. In addition, for the purpose of disposal, samples were analyzed for KAPL-related constituents cesium-137, isotopic plutonium, and strontium-90; analytical data are presented in Tables D-1 through D-4 in Appendix D.

The soil analytical data showed a few locations with relatively elevated concentrations of radium-226 and thorium-230. Groundwater and ponded water analytical data were predominantly non-detect; detected concentrations were nominal. Similarly, analytical data from the concrete pad showed no indications of impacts from past site activities.

Since the current and reasonably anticipated future use of the site is industrial, the baseline risk analysis evaluated potential risk and dose to industrial use receptors, including industrial, maintenance, and construction workers, as well as adult and adolescent trespassers/recreators. The results of the baseline risk assessment showed no unacceptable risk or dose to any current or future human or ecological receptors through exposure to any site media.

The data quality objectives identified for this remedial investigation have been accomplished:

- Defined the nature and extent of radioactive contaminants in soil, groundwater, ponded water, and concrete pad
- Assessed the impact on groundwater from the leaching of uranium in soil
- Prepared a baseline human health and ecological risk assessment
- Characterized IDW for purposes of disposal
- Supported requirements of a future final status survey for site closure in accordance with MARSSIM, if necessary

7.2 Conclusions

Based on an evaluation of remedial investigation data and the results of the baseline risk and dose

assessment, USACE concludes that environmental media at VP H' pose no unacceptable risk or dose to current or potential future receptors under the reasonably anticipated industrial land use scenario. Therefore, no radionuclides or chemicals of concern were identified, and no remedial action is required to protect human health or the environment.

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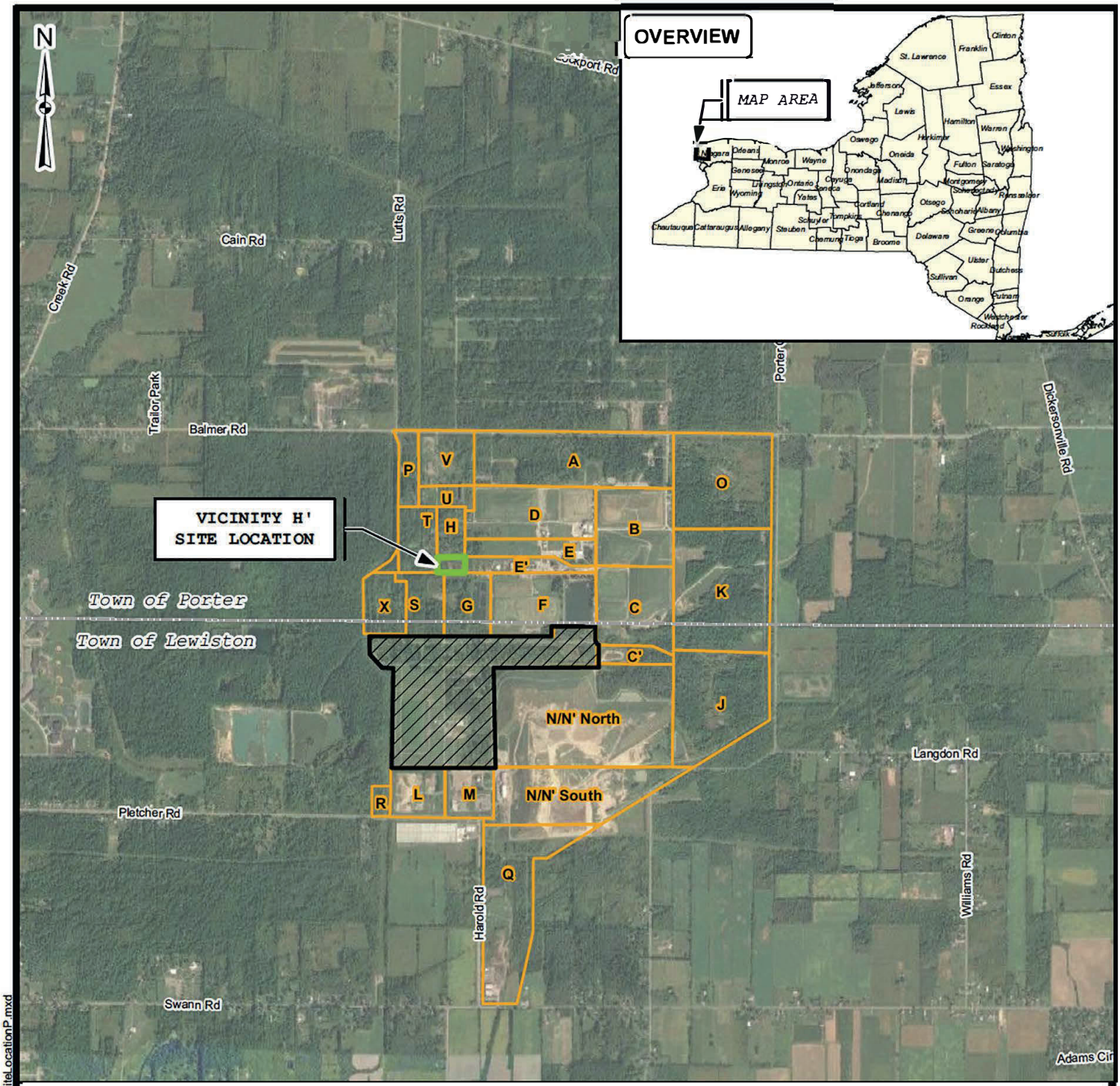

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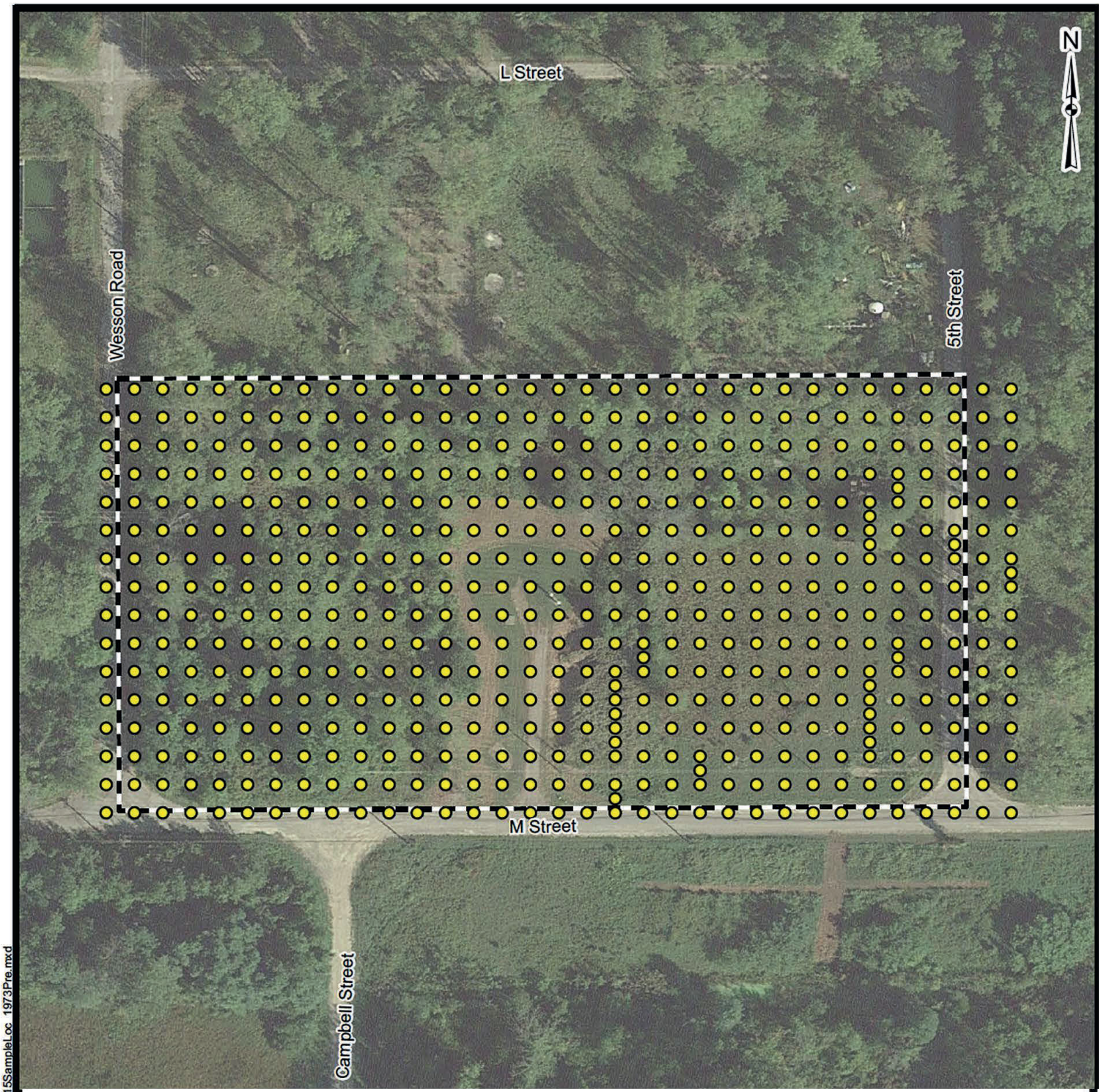
US Army Corps of Engineers Buffalo District U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS BUFFALO, NY	SITE LOCATION MAP	
Name: 211123_SiteLocationP.mxd Drawn By: H5TDESPM Date Saved: 23 Nov 2021 Time Saved: 8:43:32 AM	VICINITY PROPERTY H' NIAGARA FALLS STORAGE SITE LEWISTON-PORTER, NEW YORK	FIGURE 1



Legend

- 1973 Radiation Survey Scan Location
- Site Boundary

0 50 100 200 Feet

US Army Corps of Engineers Buffalo District

U.S. ARMY ENGINEER DISTRICT
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BUFFALO, NY

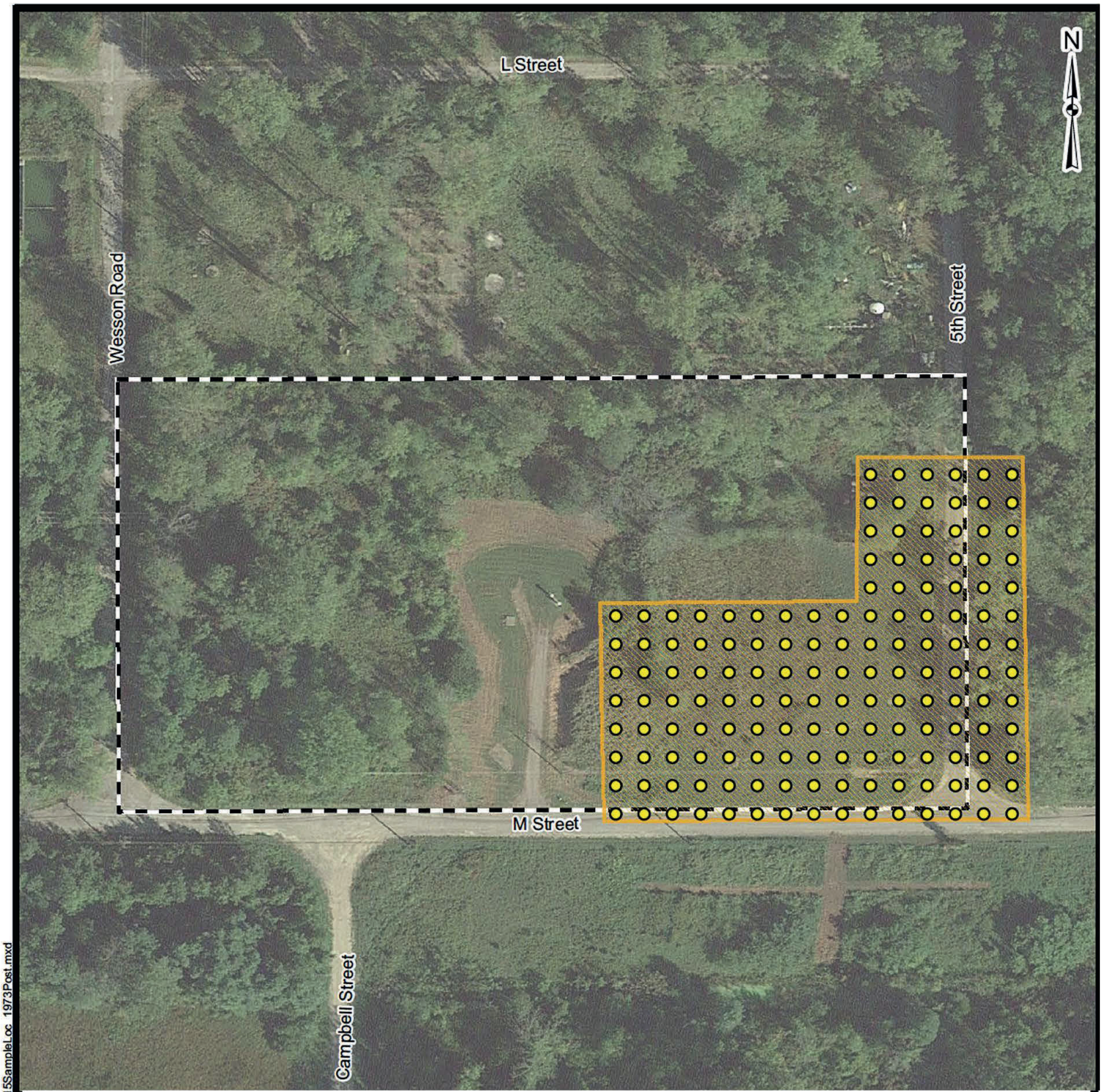
DEPARTMENT OF ENERGY 1973 PRE-EXCAVATION RADIATION SURVEY LOCATIONS

Name: 100815SampleLoc_1973Pre.mxd
Drawn By: H5TDESPM
Date Saved: 22 Nov 2021
Time Saved: 1:56:45 PM

VICINITY PROPERTY H'
NIAGARA FALLS STORAGE SITE
LEWISTON-PORTER, NEW YORK

FIGURE 2

Document Path: D:\Projects\C19\GIS\ArcMap\NFSS\VP_H'\2015\100815SampleLoc_1973Pre.mxd



Legend

- 1973 Radiation Survey Scan Location
- Area of Excavation (1973)
- Site Boundary

0 50 100 200 Feet

US Army Corps of Engineers Buffalo District

U.S. ARMY ENGINEER DISTRICT
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BUFFALO, NY

DEPARTMENT OF ENERGY 1973 POST-EXCAVATION RADIATION SURVEY LOCATIONS

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VICINITY PROPERTY H'
NIAGARA FALLS STORAGE SITE
LEWISTON-PORTER, NEW YORK

FIGURE 3

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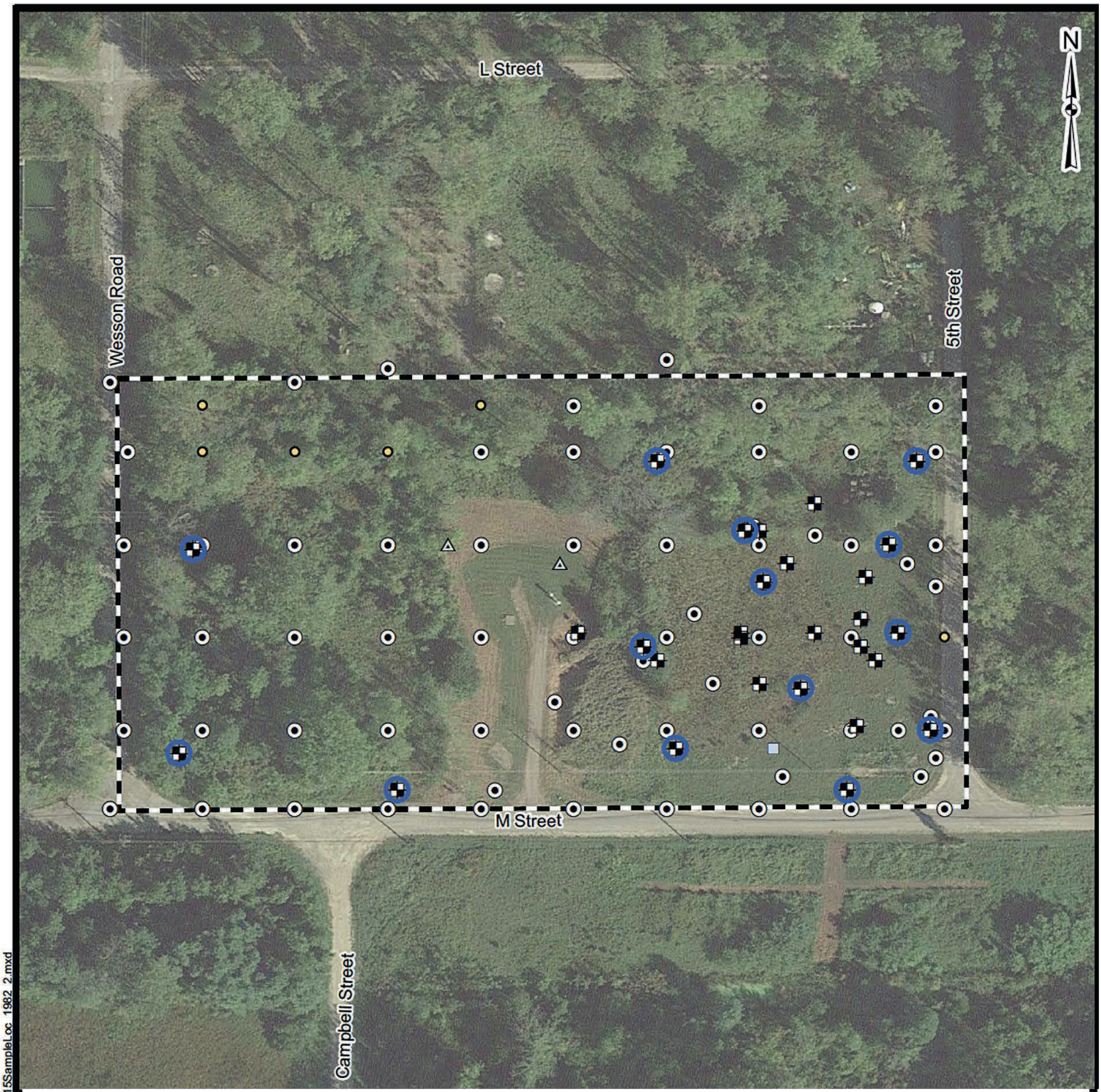

Legend

- Groundwater Sample Location
- Soil Boring
- Survey Scan Location
- Surface Soil Sample
- Surface Water/Sediment Sample
- Surface Water Sample
- Site Boundary

0 50 100 200 Feet

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DEPARTMENT OF ENERGY 1982 COMPREHENSIVE RADIOLOGICAL SURVEY

Name: 100815SampleLoc_1982_2.mxd
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Date Saved: 22 Nov 2021
Time Saved: 2:16:53 PM

VICINITY PROPERTY H'
NIAGARA FALLS STORAGE SITE
LEWISTON-PORTER, NEW YORK

FIGURE 4

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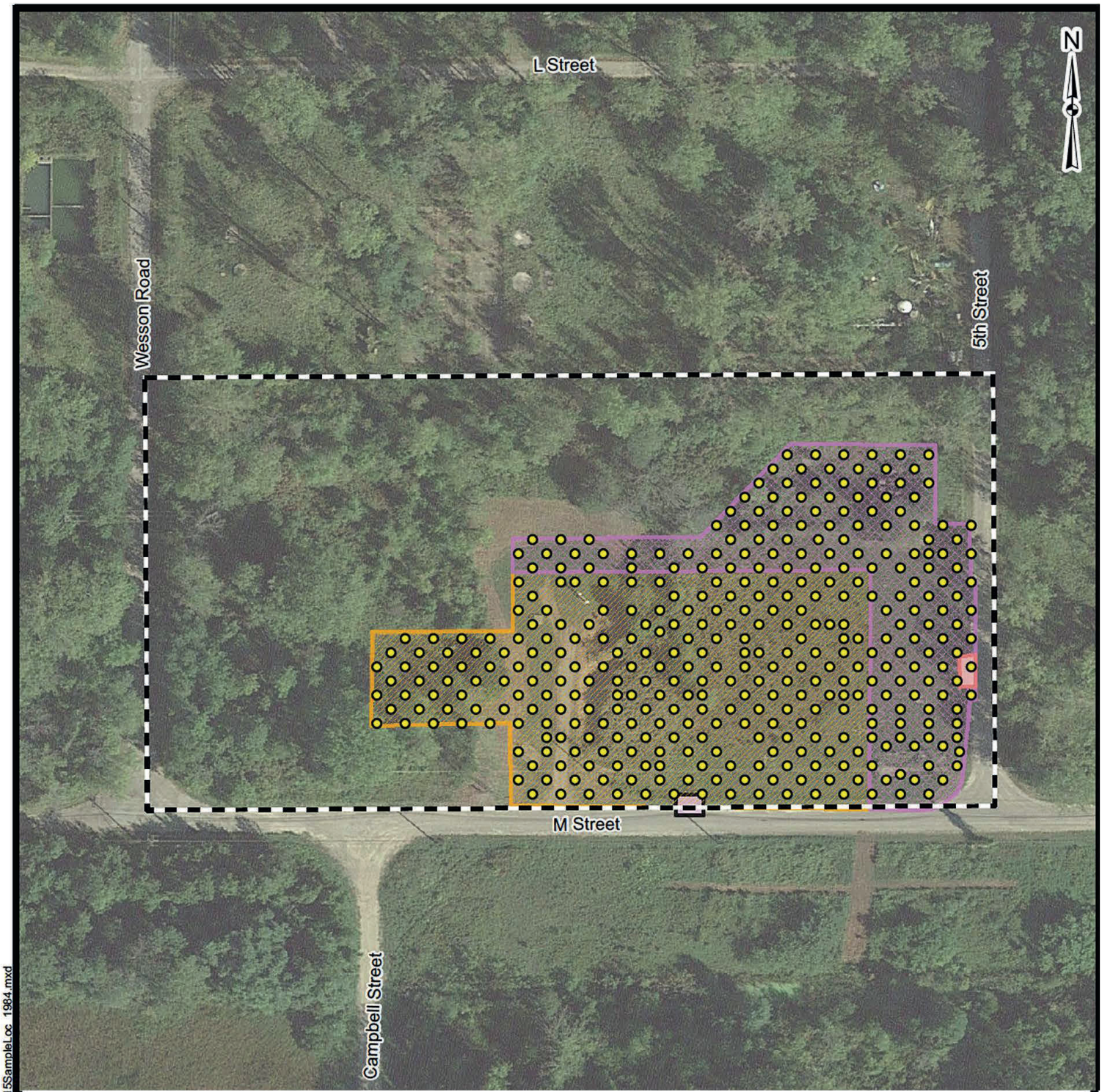

Legend

- 1984 Surface Soil Sample Location
- Site Boundary

Area of Excavation (1984)

- Excavation 1.1 ft Depth
- Excavation 2.5 ft Depth
- Excavation 5.5 ft Depth

- Area of Excavation (1986 - Black Cinder)

0 50 100 200 Feet

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DEPARTMENT OF ENERGY 1984 POST-REMEDIAL ACTION SAMPLING LOCATIONS

Name: 100815SampleLoc_1984.mxd
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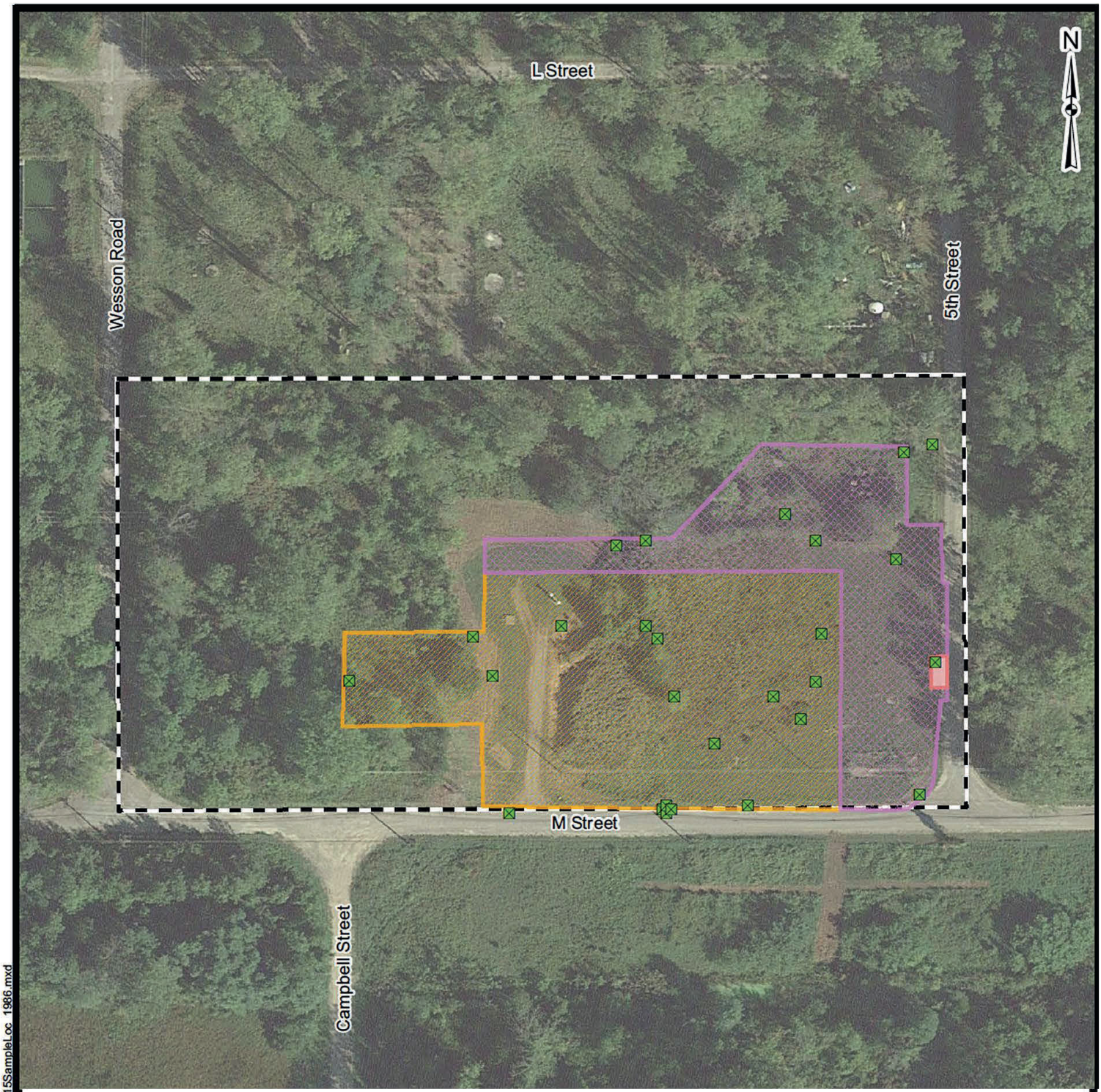
Date Saved: 22 Feb 2017
Time Saved: 8:54:21 AM

VICINITY PROPERTY H'
NIAGARA FALLS STORAGE SITE
LEWISTON-PORTER, NEW YORK

FIGURE 5

Document Path: D:\Projects\C19\GIS\ArcMap\NFSS\VP_H'\2015\100815SampleLoc_1984.mxd



Legend

- 1986 Soil Sample Location
- Site Boundary

Area of Excavation (1984)

- Excavation 1.1 ft Depth
- Excavation 2.5 ft Depth
- Excavation 5.5 ft Depth

0 50 100 200 Feet

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DEPARTMENT OF ENERGY 1986 POST-REMEDIAL ACTION VERIFICATION SAMPLING LOCATIONS

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VICINITY PROPERTY H'
NIAGARA FALLS STORAGE SITE
LEWISTON-PORTER, NEW YORK

FIGURE 6

Document Path: D:\Projects\C19\GIS\ArcMap\NFSS\VP_H'\2015\100815SampleLoc_1986.mxd

Legend

- 2004 Soil Sample Location
- Approximate Location of Geotextile Over CMSA Pad
- Site Boundary

0 50 100 200 Feet

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Buffalo District

APPROXIMATE LOCATION OF GEOTEXTILE OVER CSMA PAD

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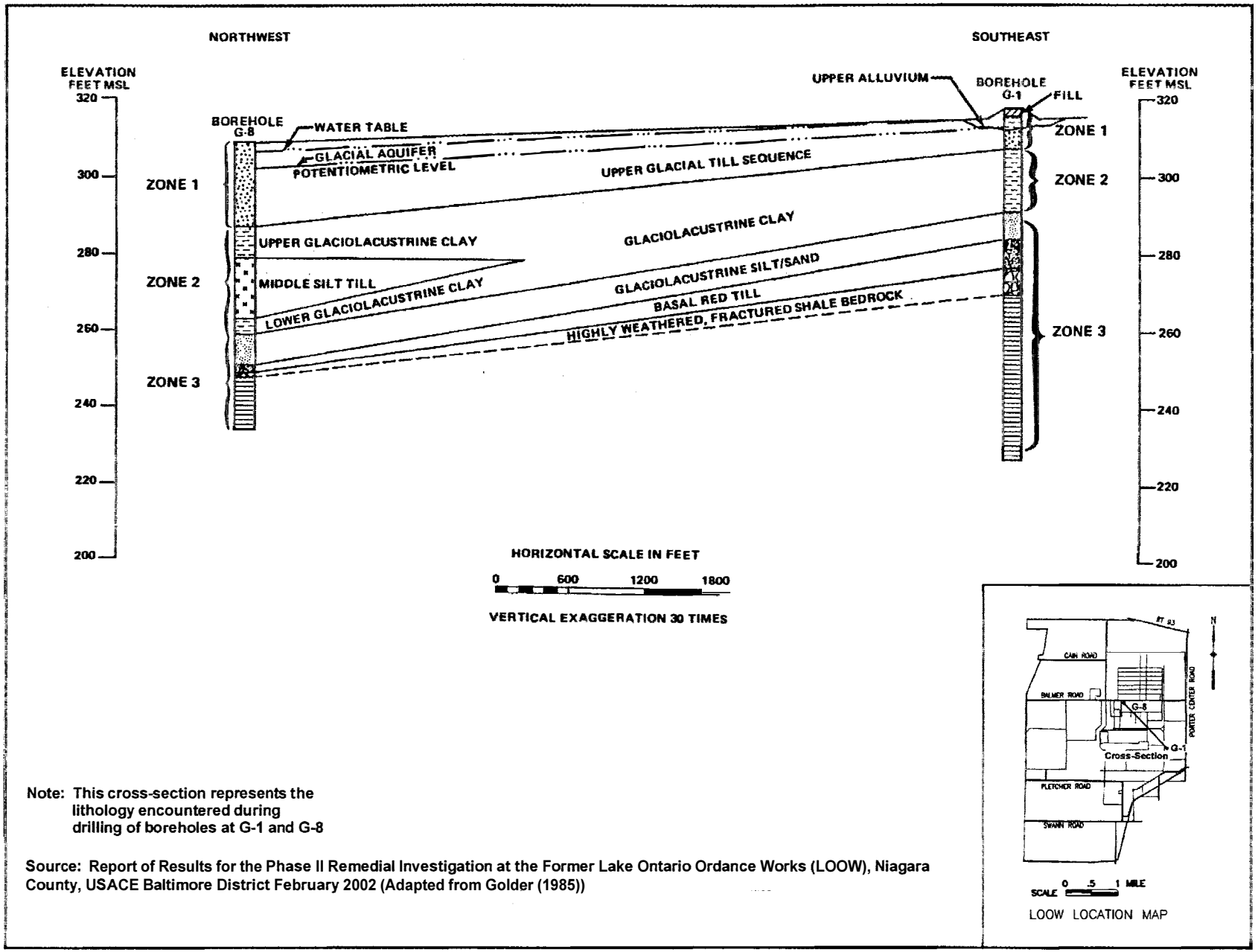
Time Saved: 1:37:04 PM

VICINITY PROPERTY H'
NIAGARA FALLS STORAGE SITE
LEWISTON-PORTER, NEW YORK

FIGURE 7

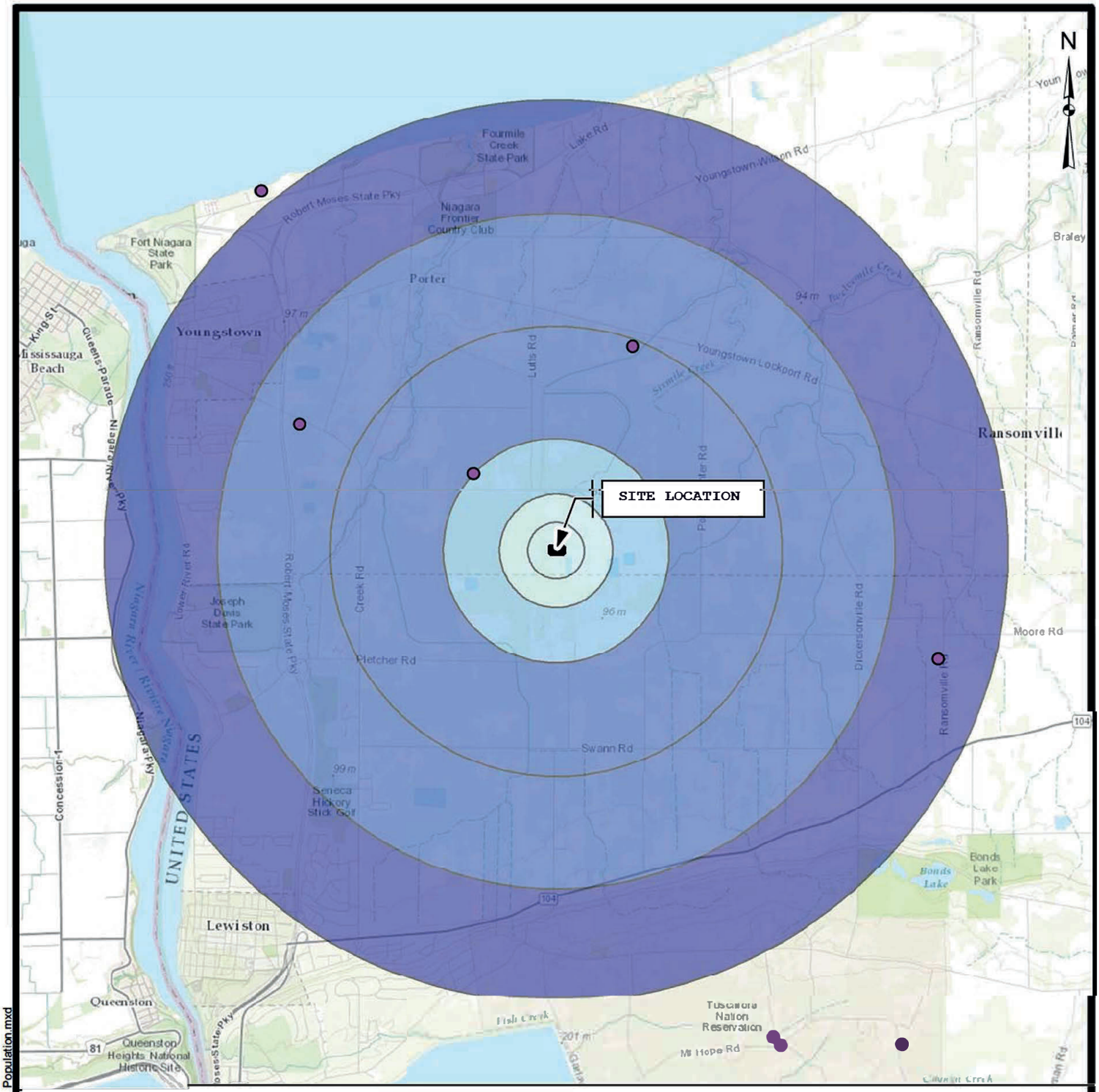
Document Path: D:\Projects\C19\GIS\ArcMap\NFSS\VP H'\2017\170320_CMSPad.mxd



Note: This cross-section represents the lithology encountered during drilling of boreholes at G-1 and G-8

Source: Report of Results for the Phase II Remedial Investigation at the Former Lake Ontario Ordance Works (LOOW), Niagara County, USACE Baltimore District February 2002 (Adapted from Golder (1985))

FIGURE 8: TYPICAL CROSS-SECTION OF THE FORMER LOOW



Legend

- VP H' Site Boundary
- Water Well Location

Population

- 0
- < 100
- 100 - 1,000
- 1,000 - 5,000
- > 5,000

Notes:
1) Census Data Provided by: LandScan 2013 Global Population Project, Oak Ridge National Laboratory - July 2014
2) Water Well Locations provided by NYSDEC - November 2015.

0 0.625 1.25 2.5 Miles

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WATER WELL LOCATIONS AND POPULATION SURROUNDING VICINITY PROPERTY H'

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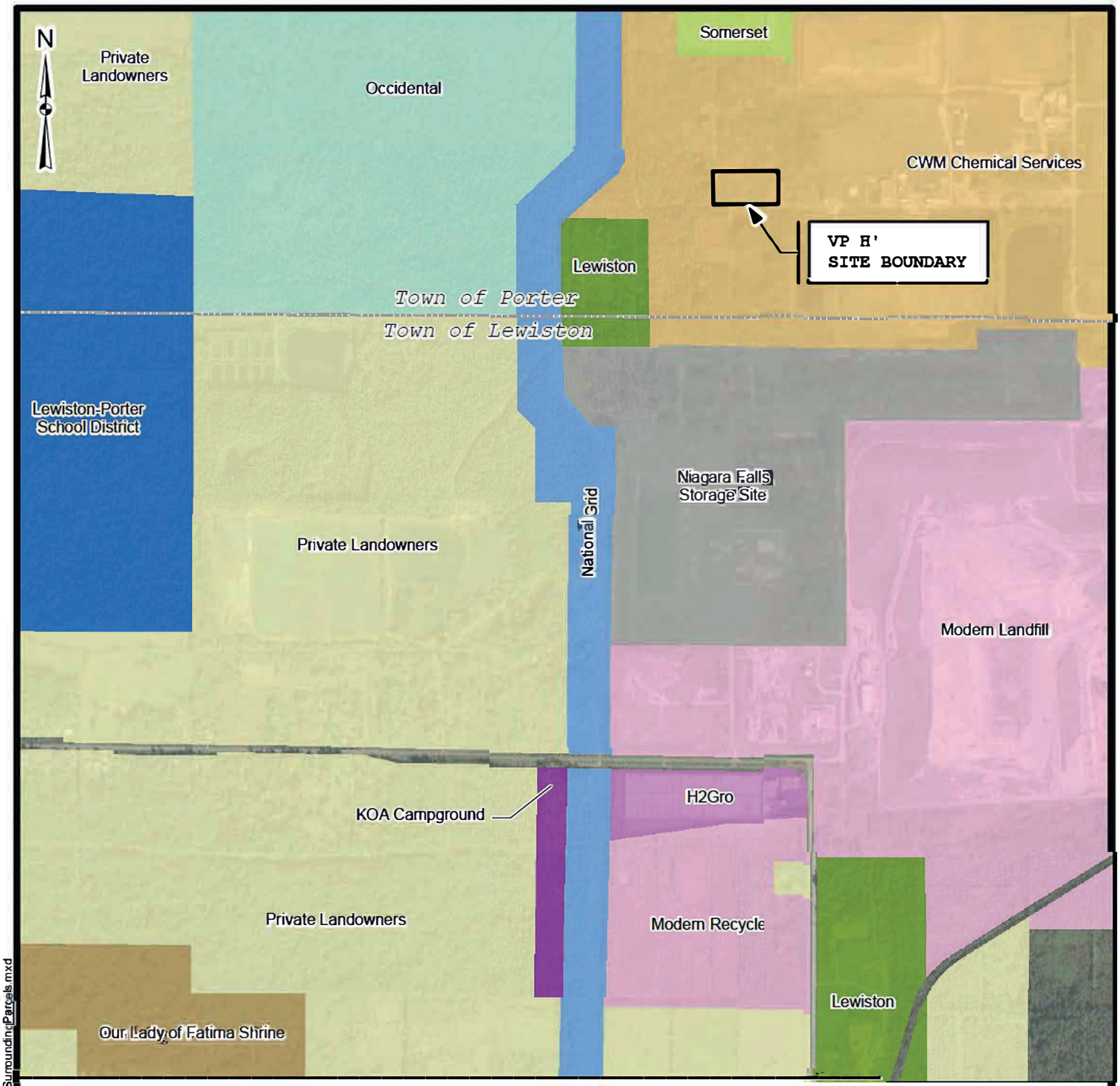
Date Saved: 04 Feb 2016
Time Saved: 11:37:53 AM

VICINITY PROPERTY H'
NIAGARA FALLS STORAGE SITE
LEWISTON-PORTER, NEW YORK

FIGURE 9

Document Path: K:\NFSP\GIS\ArcMap\VicinityProperty\VP_H'\040216_Population.mxd



Legend

- CWM Chemical Services
- H2Gro
- KOA Campground
- Lewiston
- Lewiston-Porter School District
- Modern Landfill/Modern Recycle
- National Grid
- Occidental
- Our Lady of Fatima Shrine
- Private Landowners
- Niagara Falls Storage Site
- Somerset
- Town Boundary
- Vicinity Property H' Site Boundary

0 0.125 0.25 0.5 Miles

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LAND OWNERSHIP IN THE VICINITY OF
VICINITY PROPERTY H'

Name: 220627_SurroundingParcels.mxd
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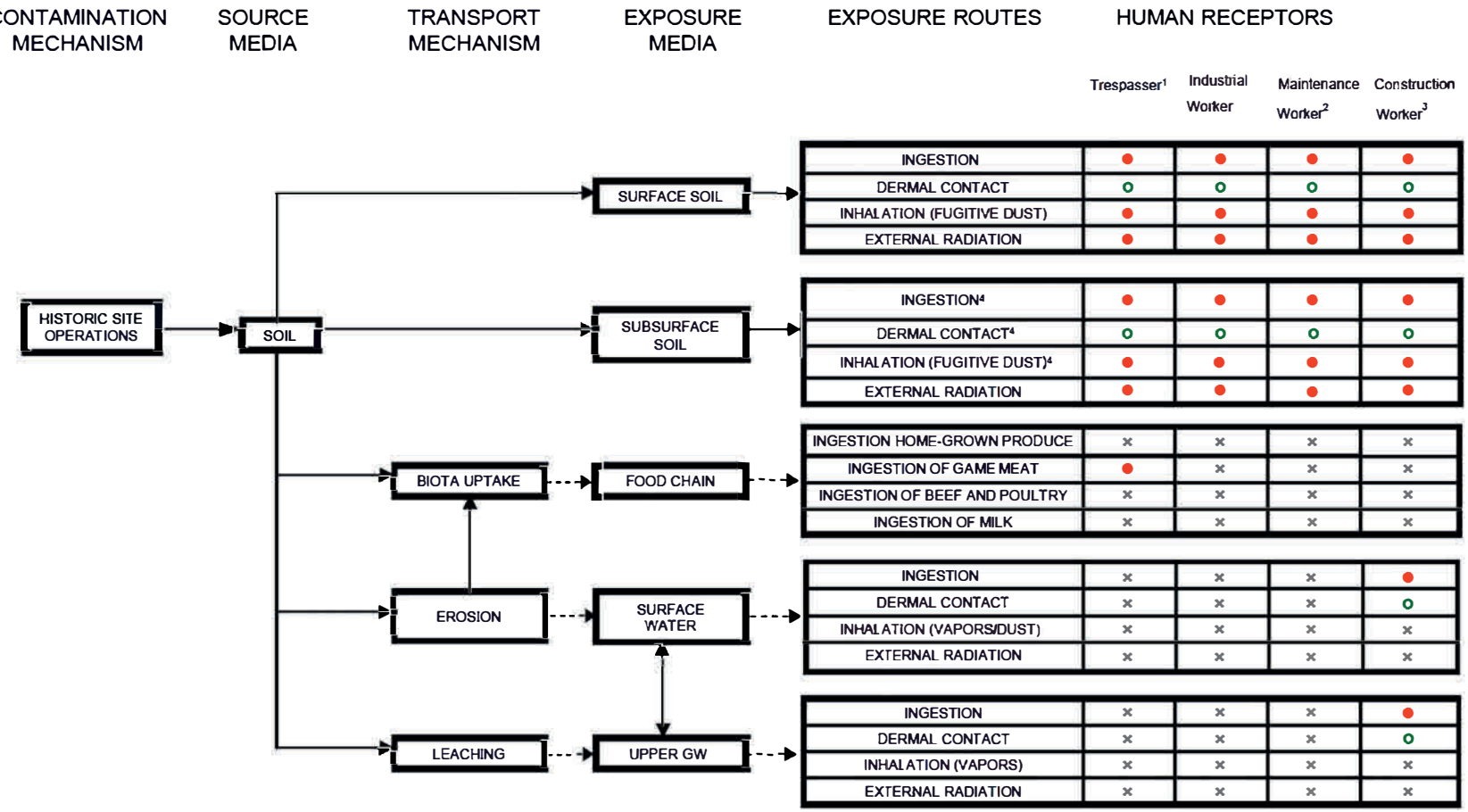
Time Saved: 8:48:34 AM

NIAGARA FALLS STORAGE SITE
LEWISTON, NEW YORK

FIGURE 10

Document Path: D:\Projects\C19GIS\ArcMap\NFSSIVP_H\20221220627_SurroundingParcels.mxd

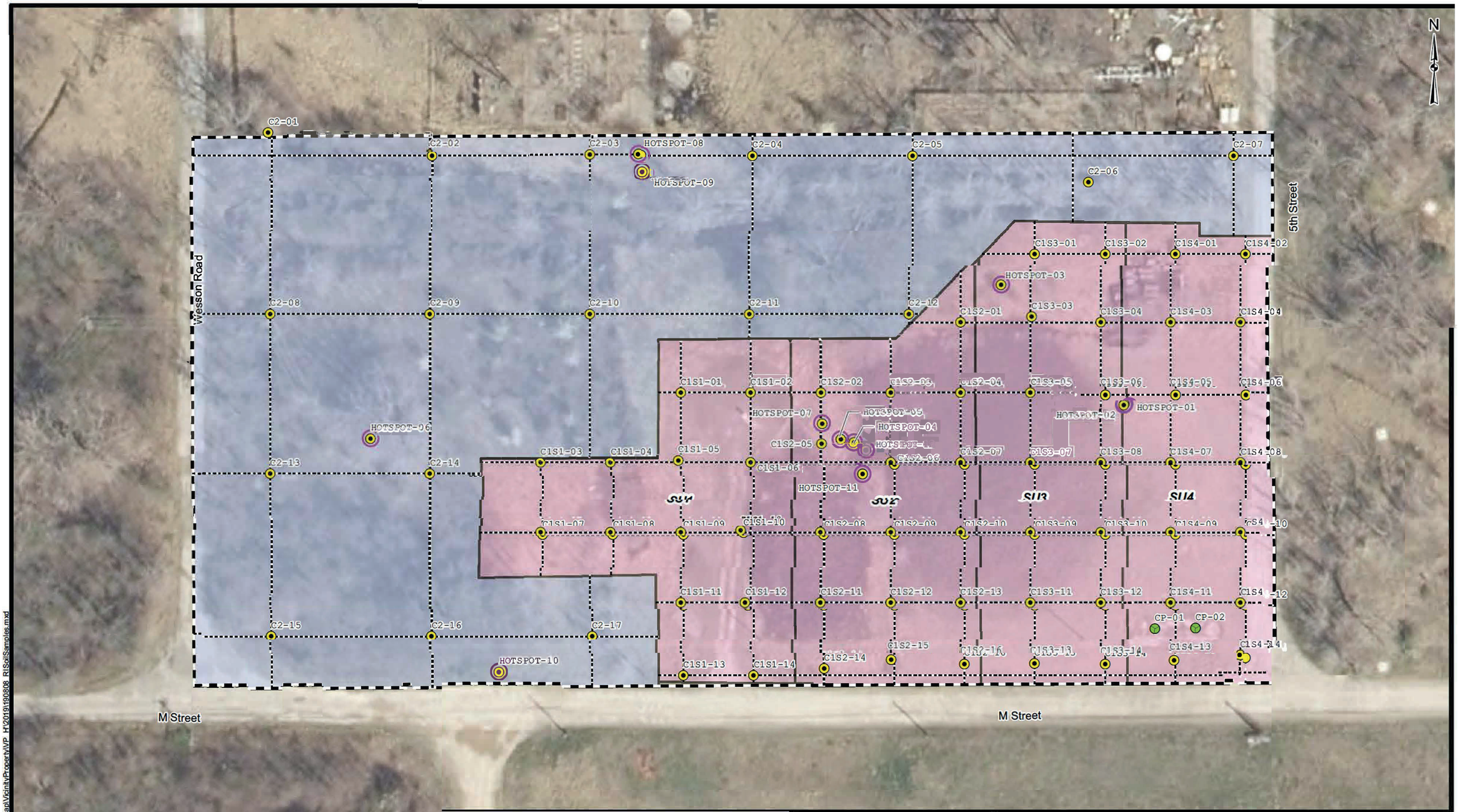
Figure 11. Conceptual Site Model – Pathways for Human Exposure at NFSS Vicinity Property H Prime



Notes:

1. Current land-use scenario of a trespasser is same as future land-use scenario of a trespasser. Adult and adolescent receptors are examined.
2. Exposure routes for current land-use scenario of maintenance worker are the same as the future land-use scenario for a maintenance worker.
3. Future land-use scenario of construction worker is intended to mimic land redevelopment.
4. The trespasser, industrial worker, and maintenance worker receptors are exposed only as the surface soil layer erodes over time and the soil mixing layer for direct exposure down-blends into the subsurface layer (see text).

Major route
Minor, limited transport route
Complete exposure pathway
Minor exposure pathway, not quantifiable
Incomplete exposure pathway



Legend

- Biased Hotspot Sample Location
- Soil Boring Location
- Concrete Pad Sample Location
- Sample Grid
- Site Boundary
- Class 1 Survey Unit
- Class 2 Survey Unit

0 25 50 100 Feet

Document Path: \\NFSSPGIS\ArcMap\Vicinity\Property\VP_H\20191\190808_RISoilSamples.mxd

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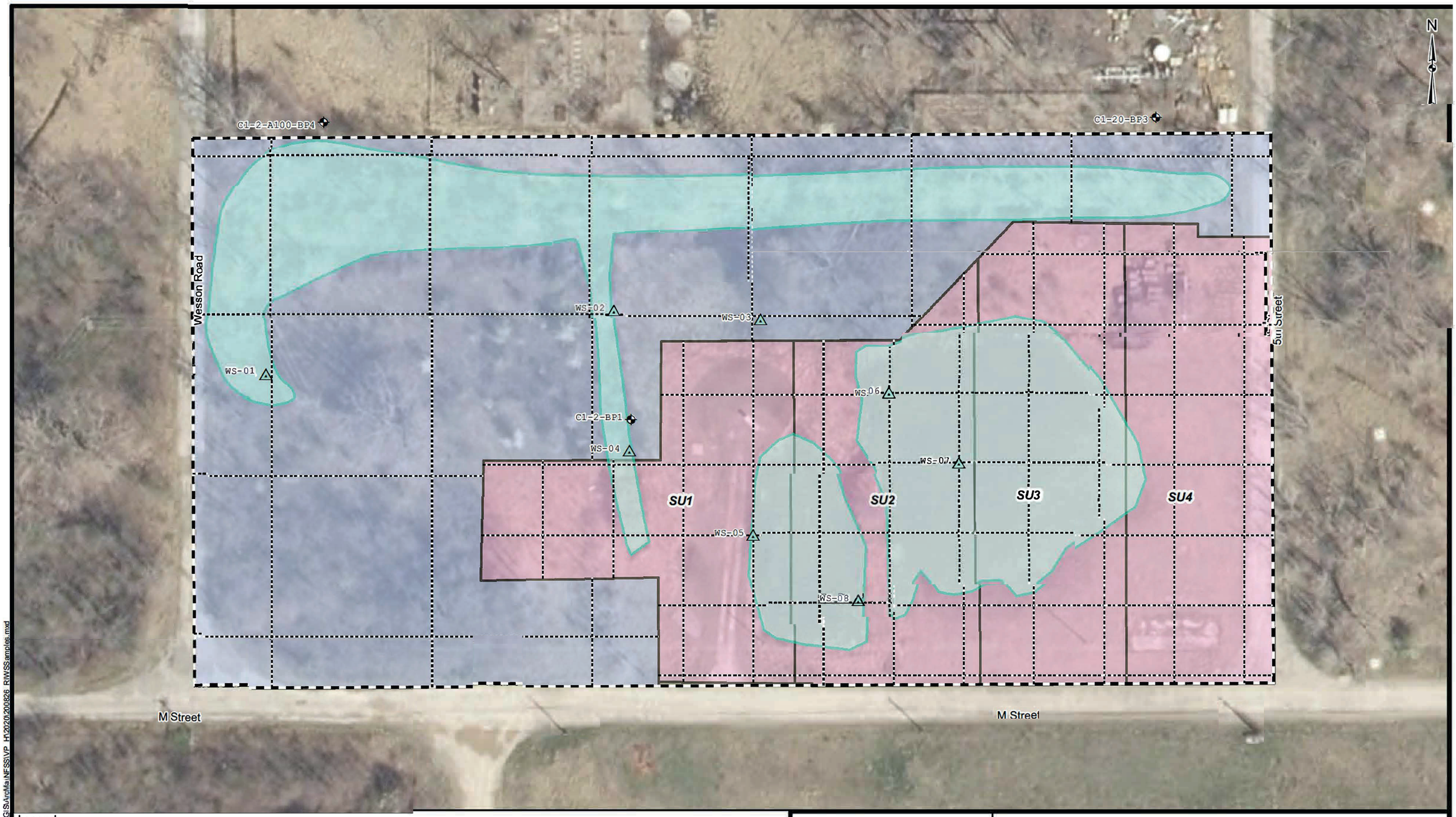
SOIL SAMPLE LOCATIONS (2018 - 2019)

VICINITY PROPERTY H'
NIAGARA FALLS STORAGE SITE
LEWISTON-PORTER, NEW YORK

FIGURE 12



Legend

- Monitoring Well Location
- Surface Water Sample Location
- Sample Grid
- Site Boundary
- Class 1 Survey Unit
- Class 2 Survey Unit
- Surface Water Feature

0 25 50 100 Feet

Document Path: D:\Projects\C19\GIS\ArcMaINESS\VP_H\2020\200826_RIWSSamples.mxd

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RI GROUNDWATER AND PONDED WATER SAMPLE LOCATIONS (2018 - 2019)

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VICINITY PROPERTY H'
NIAGARA FALLS STORAGE SITE
LEWISTON-PORTER, NEW YORK

FIGURE 13

N

Wesson Road

5th Street

M Street

M Street

Legend

Railroad (Historical)

Site Boundary

0 25 50 100 Feet

Document Path: D:\ Projects\C19\GIS\ArcMap\NFSS\VP_H\20202011118_1951Aerial.mxd

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1951 AERIAL PHOTOGRAPH

Document Name: 201118_1951Aerial.mxd
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Date Saved: 18 Nov 2020
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VICINITY PROPERTY H'
NIAGARA FALLS STORAGE SITE
LEWISTON-PORTER, NEW YORK

FIGURE 14

N

Wesson Road

5th Street

M Street

M Street

C2-01 C2-02 C2-03 HOTSPOT-08 HOTSPOT-09 C2-04 C2-05 C2-06 C2-07

C2-08 C2-09 C2-10 C2-11 C2-12

C2-13 C2-14

C2-15 C2-16 C2-17 HOTSPOT-10

C1S1-01 C1S1-02 C1S1-03 C1S1-04 C1S1-05 C1S1-06 C1S1-07 C1S1-08 C1S1-09 C1S1-10 C1S1-11 C1S1-12 C1S1-13 C1S1-14

C1S2-01 C1S2-02 C1S2-03 C1S2-04 C1S2-05 C1S2-06 C1S2-07 C1S2-08 C1S2-09 C1S2-10 C1S2-11 C1S2-12 C1S2-13 C1S2-14 C1S2-15 C1S2-16

C1S3-01 C1S3-02 C1S3-03 C1S3-04 C1S3-05 C1S3-06 C1S3-07 C1S3-08 C1S3-09 C1S3-10 C1S3-11 C1S3-12 C1S3-13 C1S3-14

C1S4-01 C1S4-02 C1S4-03 C1S4-04 C1S4-05 C1S4-06 C1S4-07 C1S4-08 C1S4-09 C1S4-10 C1S4-11 C1S4-12 C1S4-13 C1S4-14

HOTSPOT-01 HOTSPOT-02 HOTSPOT-03 HOTSPOT-04 HOTSPOT-05 HOTSPOT-06 HOTSPOT-07 HOTSPOT-11 HOTSPOT-12

CP-01 CP-02

Legend

- Biased Hotspot Sample Location
- Soil Boring Location
- Concrete Pad Sample Location
- Sample Grid
- Site Boundary

Gamma Walkover Survey Results

- CPM < Mean (7852 cpm)
- Mean + σ (2184)
- Mean + 2σ
- Mean + 3σ
- > Mean + 3σ

0 25 50 100 Feet

Document path: D:_Projects\C19\GIS\ArcMap\NFSS\VP_H\2019\190808_RISoilSamples.mxd

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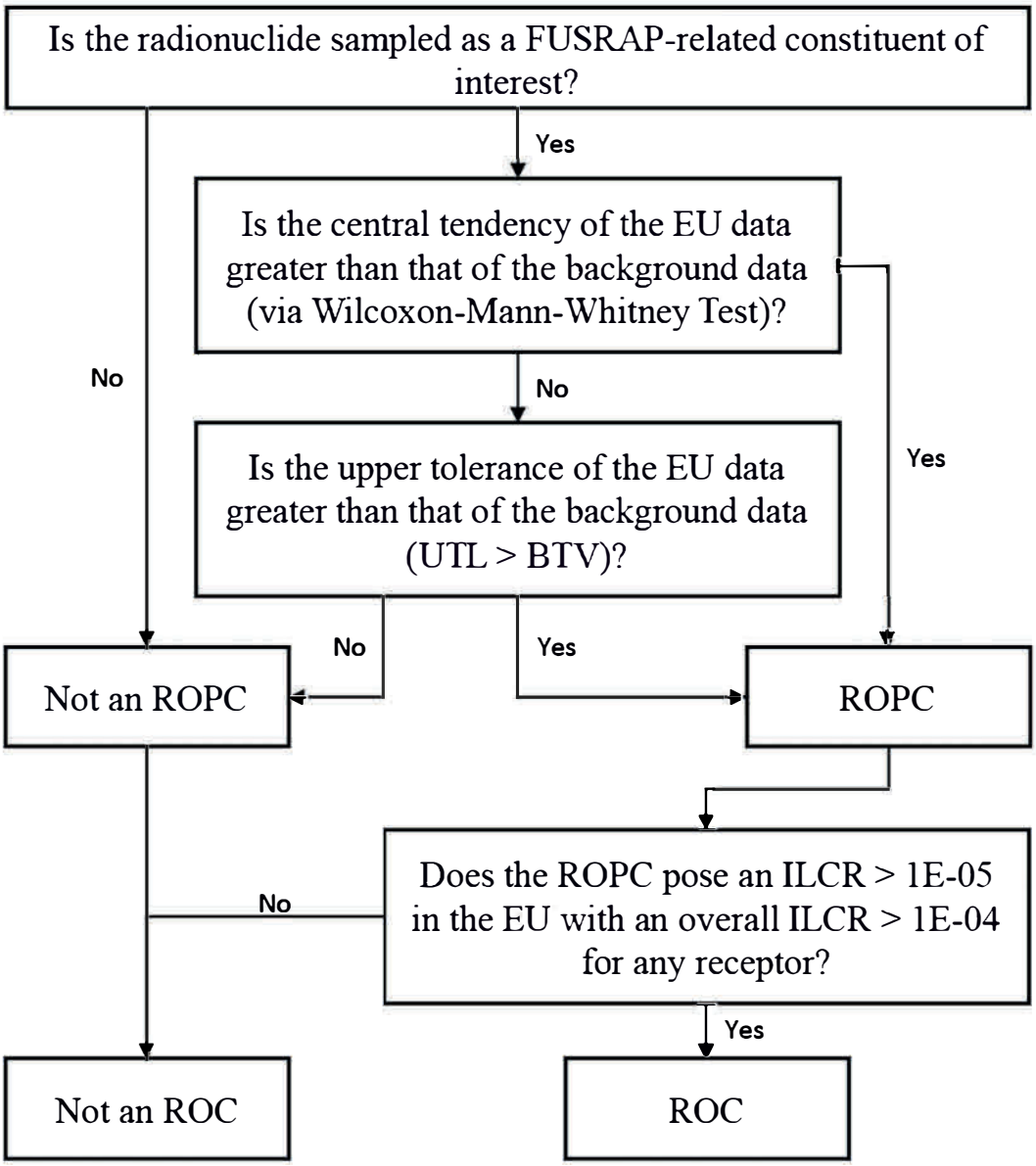
RI SOIL SAMPLE LOCATIONS AND GAMMA WALKOVER SURVEY RESULTS (2018 - 2019)

VICINITY PROPERTY H'
NIAGARA FALLS STORAGE SITE
LEWISTON-PORTER, NEW YORK

FIGURE 15



FUSRAP: Formerly Utilized Sites Remedial Action Program
EU: Exposure Unit
UTL: Upper Tolerance Limit
BTV: Background Threshold Value
ROPC: Radionuclide of Potential Concern
ILCR: Incremental Lifetime Cancer Risk
ROC: Radionuclides of Concern

Figure 16: Selection of Radionuclides of Potential Concern (ROPC) and Radionuclides of Concern (ROC) for the Human Health Risk Assessment

Table 1-1
Radionuclides Data for Samples Collected Based on Visual Inspection
LOOW CMSA Pad Removal 2004

Sample Name		SP-1			SP-2			SP-3			SP-4			SP-5			SP-6		
		LOOW-CMSAPad-1-0			LOOW-CMSAPad-2-0			LOOW-CMSAPad-3-0			LOOW-CMSAPad-4-0			LOOW-CMSAPad-5-0			LOOW-CMSAPad-6-0		
Date Sampled		11/8/2004			11/8/2004			11/8/2004			11/8/2004			11/8/2004			11/8/2004		
Constituent	unit	Result	UNC	MDA	Result	UNC	MDA	Result	UNC	MDA	Result	UNC	MDA	Result	UNC	MDA	Result	UNC	MDA
Potassium 40	uCi/kg	1.99E-02	1.17E-03	5.74E-05	1.53E-02	9.21E-04	4.82E-05	2.21E-01	1.25E-03	5.57E-05	2.30E-02	1.37E-03	7.43E-05	1.81E-02	1.12E-03	6.77E-05	1.93E-02	1.16E-03	7.03E-05
Thallium 208	uCi/kg	3.50E-04	3.87E-05	8.40E-06	2.68E-04	3.17E-05	7.09E-06	3.74E-04	3.77E-05	8.33E-06	3.87E-04	4.70E-05	1.09E-05	2.92E-04	4.24E-05	1.01E-05	2.98E-04	3.55E-05	8.02E-06
Bismuth 212	uCi/kg	7.21E-04	2.19E-04	6.43E-05	6.15E-04	1.55E-04	4.35E-05	8.43E-04	2.06E-04	6.11E-05	9.61E-04	2.19E-04	5.98E-05	7.03E-04	1.80E-04	5.01E-05	7.04E-04	2.16E-04	5.82E-05
Lead 212	uCi/kg	1.00E-03	1.55E-03	1.40E-05	7.91E-04	1.54E-03	1.19E-05	1.02E-03	2.12E-03	1.49E-05	1.17E-03	2.56E-03	1.70E-05	8.67E-04	6.16E-03	1.41E-05	8.79E-04	6.46E-03	1.38E-05
Bismuth 214	uCi/kg	7.56E-04	7.57E-05	1.54E-05	6.61E-04	6.28E-05	1.15E-05	7.29E-04	7.86E-05	1.63E-05	7.59E-04	8.92E-05	2.01E-05	7.36E-04	9.24E-05	2.08E-05	7.57E-04	8.24E-05	1.68E-05
Lead 214	uCi/kg	8.34E-04	8.67E-05	1.99E-05	6.63E-04	6.08E-05	1.36E-05	7.60E-04	7.32E-05	1.99E-05	7.85E-04	7.94E-05	1.72E-05	7.99E-04	7.26E-05	1.79E-05	8.33E-04	7.10E-05	1.72E-05
Actinium 228	uCi/kg	1.09E-03	2.76E-02	2.67E-05	7.78E-04	2.66E-02	2.13E-05	1.14E-03	3.73E-02	2.49E-05	1.25E-03	4.36E-02	2.84E-05	9.32E-04	2.49E-01	3.02E-05	9.92E-04	2.88E-01	3.19E-05
Protactinium 234 meta-stable	uCi/kg	2.76E-03	2.29E-03	1.10E-03	2.45E-03	1.92E-03	9.17E-04	9.69E-04	2.43E-03	1.25E-03	2.57E-03	2.53E-03	1.23E-03	-8.91E-04	8.87E-03	1.30E-03	2.70E-04	2.30E-03	1.20E-03
Thorium 234	uCi/kg	2.31E-03	1.06E-03	4.24E-04	2.66E-03	3.65E-04	3.90E-04	1.18E-03	7.12E-04	4.82E-04	3.76E-03	1.58E-03	5.80E-04	2.19E-03	6.78E-04	4.24E-04	2.43E-03	6.45E-04	4.58E-04
Uranium 235	uCi/kg	2.36E-04	3.73E-05	1.12E-05	4.16E-05	3.39E-05	1.17E-05	1.11E-04	3.41E-05	1.24E-05	2.80E-04	4.38E-05	1.30E-05	3.68E-05	3.17E-05	1.27E-05	3.22E-05	3.37E-05	1.41E-05
Gross Alpha	pCi/g	1.00E+01	2.60E+00	4.60E+00	5.22E+00	2.00E+00	3.90E+00	5.04E+00	1.80E+00	3.60E+00	7.50E+00	2.00E+00	3.60E+00	9.04E+00	2.20E+00	3.90E+00	5.84E+00	1.80E+00	3.30E+00
Gross Beta	pCi/g	4.67E+01	4.57E+00	8.02E+00	3.92E+01	3.76E+00	6.60E+00	3.43E+01	3.27E+00	5.71E+00	4.25E+01	3.50E+00	5.73E+00	3.44E+01	3.46E+00	6.15E+00	3.02E+01	2.85E+00	4.94E+00
Radium 226	pCi/g	5.58E-01	1.10E-01	3.00E-02	7.98E-01	1.32E-01	1.30E-02	1.19E+00	2.62E-01	9.81E-02	1.28E+00	2.19E-01	5.00E-02	9.28E-01	1.49E-01	4.84E-02	9.17E-01	1.29E-01	4.93E-02
Radium 228	pCi/g	1.09E+00	2.76E+01	2.67E-02	7.80E-01	2.66E+01	2.13E-02	1.14E+00	3.73E+01	2.49E-02	1.25E+00	4.36E+01	2.84E-02	9.30E-01	2.49E+02	3.02E-02	9.90E-01	2.88E+02	3.19E-02
Thorium 228	pCi/g	9.00E-01	1.81E-01	5.15E-02	6.00E-01	1.38E-01	6.66E-02	1.10E+00	2.02E-01	6.68E-02	1.40E+00	2.59E-01	5.90E-02	7.00E-01	1.73E-01	9.64E-02	1.10E+00	2.22E-01	6.64E-02
Thorium 230	pCi/g	1.08E+00	2.03E-01	3.33E-02	8.20E-01	1.69E-01	1.51E-02	1.21E+00	2.22E-01	1.51E-02	1.34E+00	2.57E-01	3.82E-02	1.06E+00	2.23E-01	4.42E-02	1.66E+00	2.97E-01	1.79E-02
Thorium 232	pCi/g	8.50E-01	1.72E-01	4.66E-02	6.30E-01	1.43E-01	5.15E-02	1.02E+00	1.96E-01	5.16E-02	1.06E+00	2.17E-01	5.34E-02	7.00E-01	1.72E-01	8.38E-02	9.60E-01	2.00E-01	1.79E-02
Uranium 234	pCi/g	2.62E+00	4.45E-01	1.01E-02	1.12E+00	2.11E-01	2.03E-02	8.80E-01	1.74E-01	3.61E-02	3.26E+00	5.33E-01	8.98E-03	1.23E+00	2.27E-01	2.11E-02	1.51E+00	2.74E-01	2.10E-02
Uranium 235	pCi/g	1.80E-01	6.44E-02	2.75E-02	8.00E-02	3.94E-02	1.13E-02	5.00E-02	3.03E-02	1.20E-02	2.20E-01	6.86E-02	3.01E-02	1.20E-01	4.83E-02	1.18E-02	1.00E-01	4.31E-02	1.17E-02
Uranium 238	pCi/g	2.58E+00	4.39E-01	1.00E-02	1.34E+00	2.44E-01	9.11E-03	8.10E-01	1.63E-01	9.68E-03	2.87E+00	4.74E-01	2.43E-02	1.32E+00	2.41E-01	2.10E-02	1.50E+00	2.72E-01	9.45E-03

µCi/kg - microcurie per kilogram (1 µCi/kg = 1000 pCi/g)

Table 1-2
Radionuclides Data for Samples Collected based on Gamma Hot Spot Measurements
LOOW CMSA Pad Removal 2004

Sample Name		SP-7			SP-8		
		LOOW-CMSAPad-7-0			LOOW-CMSAPad-8-0		
Date Sampled		11/8/2005			11/10/2004		
Analyte	units	Result	UNC	MDA	Result	UNC	MDA
Potassium 40	uCi/kg	1.64E-02	4.47E-03	1.38E-03	1.81E-02	1.26E-03	1.89E-04
Thallium 208	uCi/kg	-5.92E-04	5.77E-04	2.24E-04	3.17E-04	4.44E-05	1.45E-05
Bismuth 212	uCi/kg	2.47E-02	3.60E-03	1.43E-03	4.25E-04	3.97E-04	1.28E-04
Lead 212	uCi/kg	1.11E-03	4.86E-03	2.70E-04	8.76E-04	8.60E-05	2.79E-05
Bismuth 214	uCi/kg	2.65E-01	1.09E-02	3.47E-04	1.56E-02	6.71E-04	2.95E-05
Lead 214	uCi/kg	2.86E-01	1.17E-02	4.28E-04	1.60E-02	6.77E-04	3.96E-05
Actinium 228	uCi/kg	2.19E-03	3.04E-02	7.76E-04	1.13E-03	1.66E-04	5.77E-05
Protactinium 234 meta-stable	uCi/kg	3.16E-01	7.06E-02	1.77E-02	2.29E-02	5.92E-03	1.92E-03
Thorium 234	uCi/kg	1.41E-01	2.92E-02	1.09E-02	1.51E-02	3.63E-03	1.14E-03
Uranium 235	uCi/kg	2.74E-03	9.37E-04	4.52E-04	2.13E-03	1.22E-04	2.62E-05
Radium 226	pCi/g	8.36E+02	4.66E+01	4.65E-02	16*	—	—
Thorium 228	pCi/g	2.30E+00	3.58E-01	6.44E-02	—	—	—
Thorium 230	pCi/g	3.94E+02	4.77E+01	1.45E-02	---	—	—
Thorium 232	pCi/g	1.50E+01	1.90E+00	4.97E-02	1.13 *	—	—
Uranium 234	pCi/g	4.22E+01	7.84E+00	2.76E-02	22.9 *	—	—
Uranium 235	pCi/g	3.66E+00	7.97E-01	9.24E-02	2.13 *	—	—
Uranium 238	pCi/g	4.23E+01	7.86E+00	7.45E-02	22.9 *	---	---

* SP-8 resutls for Ra-226, Th-232, U-234, U-235, and U-238 were estimated using other radionuclide results from gamma spectroscopy. The U-235 by gamma spectroscopy for SP-8 is assumed to be the same as the result for the U-235, since there was no alpha spectroscopy data.

µCi/kg - microcurie per kilogram (1 µCi/kg = 1000 pCi/g)

TABLE 4-1
SUMMARY OF STATISTICAL DATA

Parameter	Units	Number of Samples	Number of Detections	Minimum MDC	Maximum MDC	Minimum Detected Result	Average Detected Result	Maximum Detected Result	Location of Maximum Detected Value	Depth of Maximum Detected Value
SOIL										
RADIUM-226	PCI/G	267	267	0.042	0.64	0.229	2.457	155.15	HOTSPOT-02	0.5-1.5
RADIUM-228	PCI/G	267	256	0.085	1.23	0.331	0.872	1.537	C1S4-09	0.5-1.5
THORIUM-228	PCI/G	267	264	0.018	0.406	0.112	0.812	1.532	C1S2-10	0-0.5
THORIUM-230	PCI/G	267	265	0.014	0.709	0.215	2.014	228.693	HOTSPOT-02	0.5-1.5
THORIUM-232	PCI/G	267	260	0.014	0.689	0.173	0.783	1.517	C1S2-10	0-0.5
URANIUM-234	PCI/G	267	267	0.014	0.31	0.253	1.022	8.252	C1S4-06	0.5-1.5
URANIUM-235	PCI/G	267	106	0.016	0.258	0.018	0.06	0.292	C1S4-06	0.5-1.5
URANIUM-238	PCI/G	267	267	0.014	0.284	0.275	1.019	8.023	C1S4-06	0.5-1.5
PONDED WATER										
UNFILTERED										
RADIUM-226	PCI/L	8	1	0.094	0.139	0.1	0.1	0.1	C1S2-03	NA
RADIUM-228	PCI/L	8		0.556	1.003		0		NA	NA
THORIUM-228	PCI/L	8	3	0.049	0.107	0.221	0.718	1.087	C2-08	NA
THORIUM-230	PCI/L	8		0.072	0.211		0		NA	NA
THORIUM-232	PCI/L	8		0.035	0.197		0		NA	NA
URANIUM-234	PCI/L	8	8	0.044	0.25	0.628	1.622	3.207	C2-10	NA
URANIUM-235	PCI/L	8	1	0.028	0.351	0.177	0.177	0.177	C2-10	NA
URANIUM-238	PCI/L	8	8	0.03	0.455	0.7	1.629	2.995	C2-10	NA
FILTERED										
RADIUM-226	PCI/L	8	1	0.079	0.148	0.14	0.14	0.14	C1S1-04	NA
RADIUM-228	PCI/L	8		0.593	1.08		0		NA	NA
THORIUM-228	PCI/L	8	6	0.022	0.083	0.123	0.421	0.832	C1S2-07	NA
THORIUM-230	PCI/L	8	5	0.017	0.114	0.03	0.043	0.066	C1S2-07	NA
THORIUM-232	PCI/L	8		0.017	0.088		0		NA	NA
URANIUM-234	PCI/L	8	8	0.042	0.271	0.664	1.852	3.871	C2-10	NA
URANIUM-235	PCI/L	8	2	0.037	0.164	0.058	0.084	0.109	C1S1-04	NA
URANIUM-238	PCI/L	8	8	0.042	0.218	0.718	1.691	3.603	C2-10	NA

NOTE: Non-Detected results are shown as blank.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S1-01	C1S1-01	C1S1-01	C1S1-02	C1S1-02
Field Sample Identifier		SO-H-C1S1-01-A	SO-H-C1S1-01-B	SO-H-C1S1-01-C	SO-H-C1S1-02-A	SO-H-C1S1-02-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/20/18	12/20/18
Parameter	Units					
RADIONUCLIDES						
RADIUM-226	PCI/G	0.953	0.763	0.778	1.185	0.81
RADIUM-228	PCI/G	1.197	0.936	0.819	0.99	1.086
THORIUM-228	PCI/G	0.732	1.023	0.842	0.932	0.711
THORIUM-230	PCI/G	0.776	0.913	1.034	0.973	0.796
THORIUM-232	PCI/G	0.605	0.715	0.627	1.104	1.347
URANIUM-234	PCI/G	0.887	0.806	0.741	0.84	1.14
URANIUM-235	PCI/G	0.024 U	0.04	0.047	0.058 U	0.05
URANIUM-238	PCI/G	0.93	0.959	0.895	0.985	0.88

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S1-02	C1S1-03	C1S1-03	C1S1-03	C1S1-04
Field Sample Identifier		SO-H-C1S1-02-C	SO-H-C1S1-03-A	SO-H-C1S1-03-B	SO-H-C1S1-03-C	SO-H-C1S1-04-A
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5
Date of Sample		12/20/18	12/19/18	12/19/18	12/19/18	12/20/18
Parameter	Units					
RADIONUCLIDES						
RADIUM-226	PCI/G	0.904	1.008	1.188	2.349	1.06
RADIUM-228	PCI/G	1.009	0.59	0.864	0.636	0.639
THORIUM-228	PCI/G	0.666	0.726	0.832	0.712	0.814
THORIUM-230	PCI/G	0.778	1.156	0.853	1.265	1.835
THORIUM-232	PCI/G	0.78	0.604	0.693	0.7	0.502
URANIUM-234	PCI/G	0.883	0.457	0.567	1.408	0.643
URANIUM-235	PCI/G	0.053	0.01 U	0.02 U	0.041	0.025 U
URANIUM-238	PCI/G	0.932	0.605	0.677	1.356	0.598

The qualifiers shown were assigned during chemistry validation.

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J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S1-04	C1S1-04	C1S1-05	C1S1-05	C1S1-05
Field Sample Identifier		SO-H-C1S1-04-B	SO-H-C1S1-04-C	SO-H-C1S1-05-A	SO-H-C1S1-05-B	SO-H-C1S1-05-C
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5
Date of Sample		12/20/18	12/20/18	12/19/18	12/19/18	12/19/18
Parameter	Units					
RADIONUCLIDES						
RADIUM-226	PCI/G	0.723	5.192	1.161	1.049	11.069
RADIUM-228	PCI/G	0.84	0.692	1.2	0.496	0.828
THORIUM-228	PCI/G	0.642	0.644	0.884	0.792	0.564
THORIUM-230	PCI/G	0.749	1.543	0.708	0.798	2.846
THORIUM-232	PCI/G	0.62	0.626	0.825	0.733	0.607
URANIUM-234	PCI/G	0.486	1.541	0.662	0.654	1.615
URANIUM-235	PCI/G	0.033 U	0.042 U	0.025 U	0.02 U	0.079
URANIUM-238	PCI/G	0.594	1.286	0.674	0.952	1.559

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S1-06	C1S1-06	C1S1-06	C1S1-06	C1S1-06
Field Sample Identifier		SO-H-C1S1-06-A	SO-H-C1S1-06-A-D	SO-H-C1S1-06-B	SO-H-C1S1-06-B-D	SO-H-C1S1-06-C
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-0.5	0.0-0.5	0.5-1.5	0.5-1.5	1.5-2.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units		Field Duplicate		Field Duplicate	
RADIONUCLIDES						
RADIUM-226	PCI/G	0.695	0.685	1.066	0.927	1.058 J
RADIUM-228	PCI/G	0.484	0.433	0.665	0.582	0.457
THORIUM-228	PCI/G	0.428	0.388	0.872	0.686	0.47
THORIUM-230	PCI/G	0.591	0.643	1	0.793	0.881
THORIUM-232	PCI/G	0.398	0.474	1.053	0.823	0.749
URANIUM-234	PCI/G	0.592	0.38	0.885	0.69	0.684 J
URANIUM-235	PCI/G	0.012 U	0.036	0.063	0.011 U	0.021 J
URANIUM-238	PCI/G	0.512	0.454	0.69	0.521	0.742

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S1-06	C1S1-07	C1S1-07	C1S1-07	C1S1-08
Field Sample Identifier		SO-H-C1S1-06-C-D	SO-H-C1S1-07-A	SO-H-C1S1-07-B	SO-H-C1S1-07-C	SO-H-C1S1-08-A
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5
Date of Sample		12/19/18	12/20/18	12/20/18	12/20/18	12/20/18
Parameter	Units	Field Duplicate				
RADIONUCLIDES						
RADIUM-226	*PCI/G*	5.586 J	1.163	1.16	0.443	1.108
RADIUM-228	*PCI/G*	0.825	0.716	1.141	0.755	1.036
THORIUM-228	*PCI/G*	0.877	0.669	0.792	0.212	0.218
THORIUM-230	*PCI/G*	1.501	0.981	0.792	0.302 U	0.613
THORIUM-232	*PCI/G*	0.779	0.553	0.684	-0.042 U	0.313
URANIUM-234	*PCI/G*	1.427 J	0.776	1.237	0.867	0.828
URANIUM-235	*PCI/G*	0.11	0.009 U	0.086	0.045	0.008 U
URANIUM-238	*PCI/G*	1.233	0.61	1.429	0.859	0.896

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S1-08	C1S1-08	C1S1-09	C1S1-09	C1S1-09
Field Sample Identifier		SO-H-C1S1-08-B	SO-H-C1S1-08-C	SO-H-C1S1-09-A	SO-H-C1S1-09-B	SO-H-C1S1-09-C
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5
Date of Sample		12/20/18	12/20/18	12/19/18	12/19/18	12/19/18
Parameter	Units					
RADIONUCLIDES						
RADIUM-226	PCI/G	0.951	0.831	0.934	1.237	1.089
RADIUM-228	PCI/G	0.913	0.464	0.359	0.888	0.859
THORIUM-228	PCI/G	1.003	0.637	0.066 U	0.755	0.737
THORIUM-230	PCI/G	0.877	0.682	0.447	0.763	0.508
THORIUM-232	PCI/G	0.77	0.637	0.326	0.757	0.771
URANIUM-234	PCI/G	1.374	1.059	0.353	0.588	0.881
URANIUM-235	PCI/G	0.027 U	0.061	-0.022 U	-0.029 U	0.025
URANIUM-238	PCI/G	1.402	0.925	0.502	0.674	0.792

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S1-10	C1S1-10	C1S1-10	C1S1-11	C1S1-11
Field Sample Identifier		SO-H-C1S1-10-A	SO-H-C1S1-10-B	SO-H-C1S1-10-C	SO-H-C1S1-11-A	SO-H-C1S1-11-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units					
RADIONUCLIDES						
RADIUM-226	PCI/G	1.698	4.101	1.166	0.924	1.48
RADIUM-228	PCI/G	0.361	1.03	1.087	0.739	1.138
THORIUM-228	PCI/G	0.545	0.758	0.894	0.876	0.709
THORIUM-230	PCI/G	0.497	0.967	0.751	0.837	0.795
THORIUM-232	PCI/G	0.288	0.907	0.898	0.766	0.787
URANIUM-234	PCI/G	0.624	1.174	0.833	0.746	0.909
URANIUM-235	PCI/G	0.022 U	0.018 U	0.015 U	0.071	0.03 U
URANIUM-238	PCI/G	0.679	1.18	0.758	0.794	0.894

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S1-11	C1S1-12	C1S1-12	C1S1-12	C1S1-13
Field Sample Identifier		SO-H-C1S1-11-C	SO-H-C1S1-12-A	SO-H-C1S1-12-B	SO-H-C1S1-12-C	SO-H-C1S1-13-A
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/20/18
Parameter	Units					
RADIONUCLIDES						
RADIUM-226	PCI/G	2.054	0.306	0.749	1.31	0.524
RADIUM-228	PCI/G	0.663	0.121 U	0.666	0.962	0.644
THORIUM-228	PCI/G	0.945	0.314	0.896	0.923	0.059 U
THORIUM-230	PCI/G	1.067	0.243	0.876	0.779	0.247 U
THORIUM-232	PCI/G	0.829	0.242	1.048	0.901	0.281
URANIUM-234	PCI/G	1.316	0.275 J+	0.623	0.955	0.576
URANIUM-235	PCI/G	0.056	0.045 U	0.038	0.044	0.008 U
URANIUM-238	PCI/G	1.177	0.43 J+	0.709	1.041	0.597

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S1-13	C1S1-13	C1S1-13	C1S1-13	C1S1-13
Field Sample Identifier		SO-H-C1S1-13-A-D	SO-H-C1S1-13-B	SO-H-C1S1-13-B-D	SO-H-C1S1-13-C	SO-H-C1S1-13-C-D
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-0.5	0.5-1.5	0.5-1.5	1.5-2.5	1.5-2.5
Date of Sample		12/20/18	12/20/18	12/20/18	12/20/18	12/20/18
Parameter	Units	Field Duplicate		Field Duplicate		Field Duplicate
RADIONUCLIDES						
RADIUM-226	*PCI/G*	0.651	1.057	0.887	0.802	1.137
RADIUM-228	*PCI/G*	0.392	1.18	0.658	0.575	0.872
THORIUM-228	*PCI/G*	0.424	0.887	0.941	0.786	0.885
THORIUM-230	*PCI/G*	0.455	0.544	1.038	1.063	0.843
THORIUM-232	*PCI/G*	0.795	0.874	0.553	0.621	0.743
URANIUM-234	*PCI/G*	0.379	0.864	0.855	1.17	0.78
URANIUM-235	*PCI/G*	0.006 U	0.008 U	0.017 U	0.049 U	0.03 U
URANIUM-238	*PCI/G*	0.275	0.748	0.816	1.08	0.906

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S1-14	C1S1-14	C1S1-14	C1S2-01	C1S2-01
Field Sample Identifier		SO-H-C1S1-14-A	SO-H-C1S1-14-B	SO-H-C1S1-14-C	SO-H-C1S2-01-A	SO-H-C1S2-01-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units					
RADIONUCLIDES						
RADIUM-226	PCI/G	0.244	0.731	1.003	1.436	0.953
RADIUM-228	PCI/G	0.204 U	0.389	0.875	0.907	1.005
THORIUM-228	PCI/G	0.259	0.725	0.639	1.38	0.707
THORIUM-230	PCI/G	0.465	0.733	0.709	1.07	1.261
THORIUM-232	PCI/G	0.173	0.59	0.711	0.733	0.721
URANIUM-234	PCI/G	0.566	0.577	1.309	1.161	1.129
URANIUM-235	PCI/G	0.015 U	0.007 U	0.022 J	0.048	0.028
URANIUM-238	PCI/G	0.57	0.459	1.119	1.112	1.114

The qualifiers shown were assigned during chemistry validation.

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J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S2-01	C1S2-02	C1S2-02	C1S2-02	C1S2-03
Field Sample Identifier		SO-H-C1S2-01-C	SO-H-C1S2-02-A	SO-H-C1S2-02-B	SO-H-C1S2-02-C	SO-H-C1S2-03-A
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	0.0-0.5	0.5-1.5	4.0-5.0	0.0-0.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/21/18
Parameter	Units					
RADIONUCLIDES						
RADIUM-226	PCI/G	0.847	0.942	1.202	1.581	0.896
RADIUM-228	PCI/G	0.844	0.827	1.105	0.713	0.883
THORIUM-228	PCI/G	0.633	1.074	0.964	0.857	0.774
THORIUM-230	PCI/G	1.179	0.967	1.192	0.989	0.629
THORIUM-232	PCI/G	0.969	0.855	0.951	0.925	0.938
URANIUM-234	PCI/G	1.555	0.916	1.28	0.797	0.544
URANIUM-235	PCI/G	0.085	0.004 U	0.052	0.01 U	0.012 U
URANIUM-238	PCI/G	1.546	0.946	1.23	0.83	0.595

The qualifiers shown were assigned during chemistry validation.

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J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S2-03	C1S2-03	C1S2-04	C1S2-04	C1S2-04
Field Sample Identifier		SO-H-C1S2-03-B	SO-H-C1S2-03-C	SO-H-C1S2-04-A	SO-H-C1S2-04-A-D	SO-H-C1S2-04-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	1.5-2.5	0.0-0.5	0.0-0.5	0.5-1.5
Date of Sample		12/21/18	12/21/18	12/21/18	12/21/18	12/21/18
Parameter	Units				Field Duplicate	
RADIONUCLIDES						
RADIUM-226	PCI/G	0.669	0.821	0.919	0.754	0.93
RADIUM-228	PCI/G	0.943	0.495	1.138	0.94	1.157
THORIUM-228	PCI/G	0.562	0.687	1.096	0.976	1.31
THORIUM-230	PCI/G	0.796	0.729	1.049	1.153	0.914
THORIUM-232	PCI/G	0.678	0.561	1.249	0.929	1.007
URANIUM-234	PCI/G	0.728	0.744	0.868	0.702	0.727
URANIUM-235	PCI/G	-0.066 U	0.048	0.013 U	0.034 U	0.008 U
URANIUM-238	PCI/G	0.542	0.863	0.685	0.776	0.689

The qualifiers shown were assigned during chemistry validation.

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J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S2-04	C1S2-04	C1S2-04	C1S2-05	C1S2-05
Field Sample Identifier		SO-H-C1S2-04-B-D	SO-H-C1S2-04-C	SO-H-C1S2-04-C-D	SO-H-C1S2-05-A	SO-H-C1S2-05-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	1.5-2.5	1.5-2.5	0.0-0.5	0.5-1.5
Date of Sample		12/21/18	12/21/18	12/21/18	12/19/18	12/19/18
Parameter	Units	Field Duplicate		Field Duplicate		
RADIONUCLIDES						
RADIUM-226	*PCI/G*	0.664	0.894	0.879	2.957	4.573
RADIUM-228	*PCI/G*	1.334	1.11	0.692	0.705	0.629
THORIUM-228	*PCI/G*	0.912	0.585	1.37	0.844	0.782
THORIUM-230	*PCI/G*	0.989	0.941	0.702	1.328	1.903
THORIUM-232	*PCI/G*	1.222	0.751	0.435	0.874	0.742
URANIUM-234	*PCI/G*	0.6	0.516	0.829	0.869	1.238
URANIUM-235	*PCI/G*	0.016 U	0.029 U	0.019 U	0.033	0.055
URANIUM-238	*PCI/G*	0.763	0.77	0.699	1.092	1.109

The qualifiers shown were assigned during chemistry validation.

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J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S2-05	C1S2-06	C1S2-06	C1S2-06	C1S2-07
Field Sample Identifier		SO-H-C1S2-05-C	SO-H-C1S2-06-A	SO-H-C1S2-06-B	SO-H-C1S2-06-C	SO-H-C1S2-07-A
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5
Date of Sample		12/19/18	12/21/18	12/21/18	12/21/18	12/21/18
Parameter	Units					
RADIONUCLIDES						
RADIUM-226	PCI/G	6.18	1.141	2.379	0.958	0.935
RADIUM-228	PCI/G	1.163	1.41	1.092	0.989	1.031
THORIUM-228	PCI/G	0.781	0.812	0.657	0.649	1.004
THORIUM-230	PCI/G	1.925 J	1.019	2.047	0.831	1.096
THORIUM-232	PCI/G	0.678	0.879	0.683	0.859	0.895
URANIUM-234	PCI/G	1.226	0.773	1.299	0.991	0.764
URANIUM-235	PCI/G	0.08	0.049	0.076	0.03	0.005 U
URANIUM-238	PCI/G	1.207	0.634	1.297	0.765	0.792

The qualifiers shown were assigned during chemistry validation.

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J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S2-07	C1S2-07	C1S2-08	C1S2-08	C1S2-08
Field Sample Identifier		SO-H-C1S2-07-B	SO-H-C1S2-07-C	SO-H-C1S2-08-A	SO-H-C1S2-08-B	SO-H-C1S2-08-C
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5
Date of Sample		12/21/18	12/21/18	01/23/19	01/23/19	01/23/19
Parameter	Units					
RADIONUCLIDES						
RADIUM-226	PCI/G	1.346	1.125	0.928	1.027	1.419
RADIUM-228	PCI/G	0.995	1.229	0.823	0.499	0.751
THORIUM-228	PCI/G	0.736	1.096	0.878	0.75	0.854
THORIUM-230	PCI/G	1.074	1.039	0.729	0.809	0.882
THORIUM-232	PCI/G	0.76	0.805	0.75	0.737	0.873
URANIUM-234	PCI/G	1.244	1.044	0.807	0.969	1.03
URANIUM-235	PCI/G	0.049	0.049	0.051 U	0.077	0.084
URANIUM-238	PCI/G	1.368	1.153	0.819	1.84	0.841

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S2-09	C1S2-09	C1S2-09	C1S2-10	C1S2-10
Field Sample Identifier		SO-H-C1S2-09-A	SO-H-C1S2-09-B	SO-H-C1S2-09-C	SO-H-C1S2-10-A	SO-H-C1S2-10-A-D
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5	0.0-0.5
Date of Sample		12/21/18	12/21/18	12/21/18	12/16/18	12/16/18
Parameter	Units					Field Duplicate
RADIONUCLIDES						
RADIUM-226	PCI/G	1.186	1.087	0.966	1.61	1.105
RADIUM-228	PCI/G	0.872	1.04	1.132	1.071	0.835
THORIUM-228	PCI/G	1.284	1.066	1.001	0.796	1.532
THORIUM-230	PCI/G	0.746	1.321	0.982	1.282	1.657
THORIUM-232	PCI/G	0.691	1.125	1.108	0.783	1.517
URANIUM-234	PCI/G	1.137	1.46	0.785	0.894	0.892
URANIUM-235	PCI/G	0.015 U	0.072	0.012 U	0.016 U	0.013 U
URANIUM-238	PCI/G	1.056	1.627	0.674	0.827	0.833

The qualifiers shown were assigned during chemistry validation.

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J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S2-10	C1S2-10	C1S2-10	C1S2-10	C1S2-11
Field Sample Identifier		SO-H-C1S2-10-B	SO-H-C1S2-10-B-D	SO-H-C1S2-10-C	SO-H-C1S2-10-C-D	SO-H-C1S2-11-A
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	0.5-1.5	1.5-2.5	1.5-2.5	0.0-0.5
Date of Sample		12/16/18	12/16/18	12/16/18	12/16/18	01/23/19
Parameter	Units		Field Duplicate		Field Duplicate	
RADIONUCLIDES						
RADIUM-226	PCI/G	0.907	1.048	0.89	1.151	1.211
RADIUM-228	PCI/G	0.778	1.149	0.59	1.38	0.93
THORIUM-228	PCI/G	0.681	1.089	0.852	0.986	0.829
THORIUM-230	PCI/G	0.54	1.021	1.276	1.228	0.767
THORIUM-232	PCI/G	0.959	1.079	0.639	0.682	0.74
URANIUM-234	PCI/G	1.115	1.817	1.223	1.88	0.956
URANIUM-235	PCI/G	0.022 U	0.031 J	0.013 U	0.076 U	0.02 U
URANIUM-238	PCI/G	1.136 J	1.989 J	1.134	1.971	0.82

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S2-11	C1S2-11	C1S2-12	C1S2-12	C1S2-12
Field Sample Identifier		SO-H-C1S2-11-B	SO-H-C1S2-11-C	SO-H-C1S2-12-A	SO-H-C1S2-12-B	SO-H-C1S2-12-C
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5
Date of Sample		01/23/19	01/23/19	12/21/18	12/21/18	12/21/18
Parameter	Units					
RADIONUCLIDES						
RADIUM-226	PCI/G	1.02	0.556	0.811	1.447	0.774
RADIUM-228	PCI/G	1.335	0.855	0.826	1.14	1.261
THORIUM-228	PCI/G	1.22	1.23	0.766	0.958	0.805
THORIUM-230	PCI/G	0.615	0.743	0.815	1.006	0.726
THORIUM-232	PCI/G	0.961	1.04	0.715	0.946	0.845
URANIUM-234	PCI/G	0.808	0.445	1.184	1.032	0.527
URANIUM-235	PCI/G	0.032 U	0.018 U	0.029 U	0.068	0.017 U
URANIUM-238	PCI/G	0.696	0.585	1.153	0.921	0.744

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S2-13	C1S2-13	C1S2-13	C1S2-14	C1S2-14
Field Sample Identifier		SO-H-C1S2-13-A	SO-H-C1S2-13-B	SO-H-C1S2-13-C	SO-H-C1S2-14-A	SO-H-C1S2-14-A-D
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5	0.0-0.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units					Field Duplicate
RADIONUCLIDES						
RADIUM-226	PCI/G	0.718	1.199	1.448	0.892	0.956
RADIUM-228	PCI/G	1.114	0.578	1.153	1.018	1.039
THORIUM-228	PCI/G	0.952	0.824	0.868	0.97	0.713
THORIUM-230	PCI/G	0.975	0.799	0.808	0.804	1.071
THORIUM-232	PCI/G	0.718	0.75	0.677	0.788	0.846
URANIUM-234	PCI/G	0.631	1.14	1.158	1.177	1.18
URANIUM-235	PCI/G	0.02 U	0.014 U	0.029 U	0.013 U	0.023
URANIUM-238	PCI/G	0.749	1.285	1.139	1.126	1.014

The qualifiers shown were assigned during chemistry validation.

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J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S2-14	C1S2-14	C1S2-14	C1S2-14	C1S2-15
Field Sample Identifier		SO-H-C1S2-14-B	SO-H-C1S2-14-B-D	SO-H-C1S2-14-C	SO-H-C1S2-14-C-D	SO-H-C1S2-15-A
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	0.5-1.5	1.5-2.5	1.5-2.5	0.0-0.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/20/18
Parameter	Units		Field Duplicate		Field Duplicate	
RADIONUCLIDES						
RADIUM-226	PCI/G	0.601	0.756	1.17	1.036	0.705
RADIUM-228	PCI/G	0.54	1.1	1.142	1.033	0.649
THORIUM-228	PCI/G	0.751	0.509	1.05	1.078	0.516
THORIUM-230	PCI/G	1.108	0.684	1.202	0.688	0.699
THORIUM-232	PCI/G	0.733	0.583	0.991	0.722	0.596
URANIUM-234	PCI/G	1.17	1.461	1.075	0.964	0.815
URANIUM-235	PCI/G	0.021 U	0.008 U	0.037	0.04 U	0.015 U
URANIUM-238	PCI/G	1.291	0.984	0.83	0.876	0.71

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S2-15	C1S2-15	C1S2-16	C1S2-16	C1S2-16
Field Sample Identifier		SO-H-C1S2-15-B	SO-H-C1S2-15-C	SO-H-C1S2-16-A	SO-H-C1S2-16-A-D	SO-H-C1S2-16-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	1.5-2.5	0.0-0.5	0.0-0.5	0.5-1.5
Date of Sample		12/20/18	12/20/18	12/19/18	12/19/18	12/19/18
Parameter	Units				Field Duplicate	
RADIONUCLIDES						
RADIUM-226	PCI/G	1.318	0.992	1.117	0.849	1.235
RADIUM-228	PCI/G	1.016	0.667	0.608	1.091	0.692
THORIUM-228	PCI/G	0.907	0.737	0.534	0.637	0.737
THORIUM-230	PCI/G	0.985	1.162	0.558	0.597	0.679
THORIUM-232	PCI/G	0.799	0.912	0.771	0.645	0.737
URANIUM-234	PCI/G	1.302	1.595	0.649	0.621	1.278
URANIUM-235	PCI/G	0.056	0.055	-0.003 U	0.033 U	0.018 U
URANIUM-238	PCI/G	1.312	1.675	0.818	0.913	1.381

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S2-16	C1S2-16	C1S2-16	C1S3-01	C1S3-01
Field Sample Identifier		SO-H-C1S2-16-B-D	SO-H-C1S2-16-C	SO-H-C1S2-16-C-D	SO-H-C1S3-01-A	SO-H-C1S3-01-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	1.5-2.5	1.5-2.5	0.0-0.5	0.5-1.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units	Field Duplicate		Field Duplicate		
RADIONUCLIDES						
RADIUM-226	PCI/G	1.228	0.871	0.62	1.05	0.884
RADIUM-228	PCI/G	0.917	0.569	0.543	0.738	0.606
THORIUM-228	PCI/G	0.865	0.713	0.563	1.251	0.547
THORIUM-230	PCI/G	1.071	0.89	0.932	1.123	0.663
THORIUM-232	PCI/G	0.844	0.693	0.598	0.849	0.912
URANIUM-234	PCI/G	1.482	1.574	1.327	0.749	0.456
URANIUM-235	PCI/G	0.038	0.041 U	0.022 U	0.013 U	0.028 U
URANIUM-238	PCI/G	1.372	1.042	1.411	0.727	0.586

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S3-01	C1S3-02	C1S3-02	C1S3-02	C1S3-02
Field Sample Identifier		SO-H-C1S3-01-C	SO-H-C1S3-02-A	SO-H-C1S3-02-A-D	SO-H-C1S3-02-B	SO-H-C1S3-02-B-D
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		2.0-3.0	0.0-0.5	0.0-0.5	0.5-1.5	0.5-1.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units			Field Duplicate		Field Duplicate
RADIONUCLIDES						
RADIUM-226	PCI/G	0.995	0.711	0.901	0.878	0.886
RADIUM-228	PCI/G	1.354	1.109	0.624	1.152	0.982
THORIUM-228	PCI/G	0.94	0.867	0.724	0.746	0.928
THORIUM-230	PCI/G	1.082	1.035	0.732	0.627	0.691
THORIUM-232	PCI/G	1.285	0.937	1.381	0.897	0.685
URANIUM-234	PCI/G	0.949	0.74	0.767	0.694	0.87
URANIUM-235	PCI/G	0.05	0.032 U	0.026 U	0.034	0.029
URANIUM-238	PCI/G	1.04	0.742	0.856	0.765	0.74

The qualifiers shown were assigned during chemistry validation.

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J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S3-02	C1S3-02	C1S3-03	C1S3-03	C1S3-03
Field Sample Identifier		SO-H-C1S3-02-C	SO-H-C1S3-02-C-D	SO-H-C1S3-03-A	SO-H-C1S3-03-B	SO-H-C1S3-03-C
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units		Field Duplicate			
RADIONUCLIDES						
RADIUM-226	*PCI/G*	0.693	0.613	1.139	0.759	1.068
RADIUM-228	*PCI/G*	0.614	0.433	0.911	0.964	0.711
THORIUM-228	*PCI/G*	0.686	0.72	0.813	0.581	0.917
THORIUM-230	*PCI/G*	0.682	0.55	0.715	2.041	1.096
THORIUM-232	*PCI/G*	0.595	0.7	0.637	0.656	0.769
URANIUM-234	*PCI/G*	0.641	0.582	0.867	0.791	0.896
URANIUM-235	*PCI/G*	0.028	0.006 U	0.029 U	0.023 U	0.033 J
URANIUM-238	*PCI/G*	0.737	0.624	0.735	0.839	1.018

The qualifiers shown were assigned during chemistry validation.

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J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S3-04	C1S3-04	C1S3-04	C1S3-05	C1S3-05
Field Sample Identifier		SO-H-C1S3-04-A	SO-H-C1S3-04-B	SO-H-C1S3-04-C	SO-H-C1S3-05-A	SO-H-C1S3-05-A-D
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5	0.0-0.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units					Field Duplicate
RADIONUCLIDES						
RADIUM-226	PCI/G	0.794	0.92	0.908	0.855	0.999
RADIUM-228	PCI/G	0.994	0.784	0.535	0.71	0.728
THORIUM-228	PCI/G	0.927	0.985	R	0.931	0.777
THORIUM-230	PCI/G	1.581	1.333	R	1.148	0.737
THORIUM-232	PCI/G	0.781	0.859	R	1.098	0.899
URANIUM-234	PCI/G	0.804	0.901	1.236	0.501	0.64
URANIUM-235	PCI/G	0.044	0.023 J	0.04 U	0.045 U	0.047 U
URANIUM-238	PCI/G	0.89	0.724	1.187	0.602	0.613

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S3-05	C1S3-05	C1S3-05	C1S3-05	C1S3-06
Field Sample Identifier		SO-H-C1S3-05-B	SO-H-C1S3-05-B-D	SO-H-C1S3-05-C	SO-H-C1S3-05-C-D	SO-H-C1S3-06-A
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	0.5-1.5	1.5-2.5	1.5-2.5	0.0-0.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units		Field Duplicate		Field Duplicate	
RADIONUCLIDES						
RADIUM-226	*PCI/G*	1.141	0.946	0.941	1.017	0.947
RADIUM-228	*PCI/G*	1.07	0.825	0.871	1.061	0.672
THORIUM-228	*PCI/G*	0.695	0.793	0.799	0.823	0.775
THORIUM-230	*PCI/G*	0.625	0.603	0.812	0.921	0.899
THORIUM-232	*PCI/G*	0.671	0.924	0.602	0.65	0.985
URANIUM-234	*PCI/G*	1.681	1.502	1.074	1.415	0.818
URANIUM-235	*PCI/G*	0.04 U	0.018 U	0.054	0.072	0.061
URANIUM-238	*PCI/G*	1.939	1.666	1.167	1.404	0.839

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S3-06	C1S3-06	C1S3-07	C1S3-07	C1S3-07
Field Sample Identifier		SO-H-C1S3-06-B	SO-H-C1S3-06-C	SO-H-C1S3-07-A	SO-H-C1S3-07-B	SO-H-C1S3-07-C
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units					
RADIONUCLIDES						
RADIUM-226	PCI/G	1.167	1.129	1.001	2.864	0.748
RADIUM-228	PCI/G	1.282	1.083	0.633	0.657	0.921
THORIUM-228	PCI/G	0.692	0.788	1.002	0.603	0.779
THORIUM-230	PCI/G	1.657	0.836	0.836	0.859	0.097 U
THORIUM-232	PCI/G	0.983	0.861	1.153	0.607	0.54
URANIUM-234	PCI/G	0.839	0.89	0.702	1.576	1.289
URANIUM-235	PCI/G	0.041	0.021 U	-0.026 U	0.067	0.037 U
URANIUM-238	PCI/G	0.83	1.137	0.647	1.258	1.187

The qualifiers shown were assigned during chemistry validation.

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J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S3-08	C1S3-08	C1S3-08	C1S3-09	C1S3-09
Field Sample Identifier		SO-H-C1S3-08-A	SO-H-C1S3-08-B	SO-H-C1S3-08-C	SO-H-C1S3-09-A	SO-H-C1S3-09-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units					
RADIONUCLIDES						
RADIUM-226	PCI/G	0.729	1.402	1.04	0.825	0.883
RADIUM-228	PCI/G	1.095	0.965	0.732	1.263	1.21
THORIUM-228	PCI/G	0.755	0.695	0.915	1.162	0.709
THORIUM-230	PCI/G	0.716	0.835	0.636	0.863	0.717
THORIUM-232	PCI/G	0.653	0.705	0.694	1.304	0.703
URANIUM-234	PCI/G	0.826	0.893	1.051	0.653	0.766
URANIUM-235	PCI/G	0.01 U	0.04 U	0.036 U	0.035	0.042
URANIUM-238	PCI/G	0.762	0.934	1.11	0.637	0.583

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S3-09	C1S3-10	C1S3-10	C1S3-10	C1S3-10
Field Sample Identifier		SO-H-C1S3-09-C	SO-H-C1S3-10-A	SO-H-C1S3-10-A-D	SO-H-C1S3-10-B	SO-H-C1S3-10-B-D
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	0.0-0.5	0.0-0.5	0.5-1.5	0.5-1.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units			Field Duplicate		Field Duplicate
RADIONUCLIDES						
RADIUM-226	PCI/G	1.454	0.991	1.184	0.839	0.995
RADIUM-228	PCI/G	0.591	1.288	0.542	0.754	0.647
THORIUM-228	PCI/G	1.171	0.951	0.831	0.838	0.859
THORIUM-230	PCI/G	1.142	0.997	1.079	0.923	0.929
THORIUM-232	PCI/G	1.16	0.943	1.028	0.948	1.25
URANIUM-234	PCI/G	1.391	0.896 J	0.743 J	R	0.976 J
URANIUM-235	PCI/G	0.044	-0.064 UJ	0.008 U	R	0.054 J
URANIUM-238	PCI/G	1.319	0.638 J	0.842 J	R	0.886 J

The qualifiers shown were assigned during chemistry validation.

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J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S3-10	C1S3-10	C1S3-11	C1S3-11	C1S3-11
Field Sample Identifier		SO-H-C1S3-10-C	SO-H-C1S3-10-C-D	SO-H-C1S3-11-A	SO-H-C1S3-11-B	SO-H-C1S3-11-C
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units		Field Duplicate			
RADIONUCLIDES						
RADIUM-226	PCI/G	1.15	1.047	0.797	1.956	2.389
RADIUM-228	PCI/G	0.69	0.94	1.381	0.968	0.649
THORIUM-228	PCI/G	0.779	0.957	0.924	0.902	0.884
THORIUM-230	PCI/G	0.852	0.513	0.868	0.856	0.999
THORIUM-232	PCI/G	0.818	0.623	1.069	1.133	1.026
URANIUM-234	PCI/G	0.829 J	1.201 J	0.723	2.078	1.667
URANIUM-235	PCI/G	0.017 UJ	0.05 UJ	0.008 U	0.024 U	0.049
URANIUM-238	PCI/G	0.873 J	1.286 J	0.897	2.108	1.73

The qualifiers shown were assigned during chemistry validation.

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J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S3-12	C1S3-12	C1S3-12	C1S3-13	C1S3-13
Field Sample Identifier		SO-H-C1S3-12-A	SO-H-C1S3-12-B	SO-H-C1S3-12-C	SO-H-C1S3-13-A	SO-H-C1S3-13-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units					
RADIONUCLIDES						
RADIUM-226	PCI/G	1.332	1.278	1.137	0.92	0.913
RADIUM-228	PCI/G	0.949	1.375	1.255	0.889	1.084
THORIUM-228	PCI/G	0.885	0.943	0.939	0.781	0.795
THORIUM-230	PCI/G	1.161	1.019	1.051	1.43	1.019
THORIUM-232	PCI/G	0.948	0.779	1.105	0.835	0.776
URANIUM-234	PCI/G	1.012	1.414	1.252	0.864	0.888
URANIUM-235	PCI/G	0.045	0.095	0.074	0.014 U	0.009 U
URANIUM-238	PCI/G	1.105	1.317	1.259	0.663	0.862

The qualifiers shown were assigned during chemistry validation.

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J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S3-13	C1S3-14	C1S3-14	C1S3-14	C1S3-14
Field Sample Identifier		SO-H-C1S3-13-C	SO-H-C1S3-14-A	SO-H-C1S3-14-A-D	SO-H-C1S3-14-B	SO-H-C1S3-14-B-D
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	0.0-0.5	0.0-0.5	0.5-1.5	0.5-1.5
Date of Sample		12/19/18	12/21/18	12/21/18	12/21/18	12/21/18
Parameter	Units			Field Duplicate		Field Duplicate
RADIONUCLIDES						
RADIUM-226	PCI/G	1.215	0.983	1.123	0.834	1.288
RADIUM-228	PCI/G	0.98	1.313	1.418	0.998	0.753
THORIUM-228	PCI/G	0.657	0.65	0.836	0.91	0.987
THORIUM-230	PCI/G	1.043	0.905	0.8	1.019	0.884
THORIUM-232	PCI/G	1.235	1.254	0.991	0.675	0.778
URANIUM-234	PCI/G	0.931	0.694	0.77	1.4	1.423
URANIUM-235	PCI/G	0.027 U	0.006 U	0.046 U	0.044	0.076 U
URANIUM-238	PCI/G	1.018	0.763	0.774	1.289	1.322

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S3-14	C1S3-14	C1S4-01	C1S4-01	C1S4-01
Field Sample Identifier		SO-H-C1S3-14-C	SO-H-C1S3-14-C-D	SO-H-C1S4-01-A	SO-H-C1S4-01-B	SO-H-C1S4-01-C
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5
Date of Sample		12/21/18	12/21/18	12/19/18	12/19/18	12/19/18
Parameter	Units		Field Duplicate			
RADIONUCLIDES						
RADIUM-226	*PCI/G*	1.26	0.988	0.815	0.669	0.711
RADIUM-228	*PCI/G*	0.867	0.952	0.771	0.563	1.231
THORIUM-228	*PCI/G*	0.66	0.806	0.927	0.771	0.71
THORIUM-230	*PCI/G*	0.941	1.194	0.855	0.854	0.995
THORIUM-232	*PCI/G*	0.971	0.762	0.799	0.801	0.81
URANIUM-234	*PCI/G*	1.023	1.099	0.406	0.62	0.712
URANIUM-235	*PCI/G*	0.047	0.031 U	0.018 U	0.031 U	0.016 U
URANIUM-238	*PCI/G*	1.28	1.094	0.627	0.719	0.706

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S4-02	C1S4-02	C1S4-02	C1S4-03	C1S4-03
Field Sample Identifier		SO-H-C1S4-02-A	SO-H-C1S4-02-B	SO-H-C1S4-02-C	SO-H-C1S4-03-A	SO-H-C1S4-03-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units					
RADIONUCLIDES						
RADIUM-226	PCI/G	0.768	1.228	1.216	0.898	0.882
RADIUM-228	PCI/G	0.331	0.543	0.9	1.153	0.647
THORIUM-228	PCI/G	0.39	0.552	0.934	1.316	0.583
THORIUM-230	PCI/G	0.252	0.653	0.961	0.952	0.77
THORIUM-232	PCI/G	0.577	0.484	0.688	0.85	0.509
URANIUM-234	PCI/G	0.565	0.8	0.839	0.791	0.596
URANIUM-235	PCI/G	0.013 U	0.004 U	0.021 U	0.004 U	0.025 U
URANIUM-238	PCI/G	0.613	0.707	0.839	0.802	0.564

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S4-03	C1S4-04	C1S4-04	C1S4-04	C1S4-04
Field Sample Identifier		SO-H-C1S4-03-C	SO-H-C1S4-04-A	SO-H-C1S4-04-A-D	SO-H-C1S4-04-B	SO-H-C1S4-04-B-D
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	0.0-0.5	0.0-0.5	0.5-1.5	0.5-1.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units			Field Duplicate		Field Duplicate
RADIONUCLIDES						
RADIUM-226	PCI/G	0.655	0.532	1.083	1.896	1.742
RADIUM-228	PCI/G	0.747	0.358	0.217 U	0.725	0.512
THORIUM-228	PCI/G	0.735	0.697	0.799	0.616	0.564
THORIUM-230	PCI/G	0.973	0.617	0.837	1.639	1.17
THORIUM-232	PCI/G	0.963	0.578	0.67	0.788	0.688
URANIUM-234	PCI/G	0.737	0.648	0.415	1.151	0.928
URANIUM-235	PCI/G	0.016 U	0.014 U	0.042	0.007 U	0.011 U
URANIUM-238	PCI/G	0.68	0.703	0.639	1.077	0.868

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S4-04	C1S4-04	C1S4-05	C1S4-05	C1S4-05
Field Sample Identifier		SO-H-C1S4-04-C	SO-H-C1S4-04-C-D	SO-H-C1S4-05-A	SO-H-C1S4-05-A-D	SO-H-C1S4-05-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	1.5-2.5	0.0-0.5	0.0-0.5	0.5-1.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units		Field Duplicate		Field Duplicate	
RADIONUCLIDES						
RADIUM-226	PCI/G	0.605	0.879	0.85	0.841	1.312
RADIUM-228	PCI/G	0.44	0.721	1.223	0.961	1.284
THORIUM-228	PCI/G	0.878	0.537	0.755	0.868	0.819
THORIUM-230	PCI/G	0.866	0.589	0.586	0.559	0.806
THORIUM-232	PCI/G	0.808	0.628	0.633	0.673	0.865
URANIUM-234	PCI/G	0.657	0.502	0.606	0.698	1.07
URANIUM-235	PCI/G	0.032 U	-0.012 U	0.015 U	0.016 U	0.035 U
URANIUM-238	PCI/G	0.507	0.858	0.715	0.597	1.226

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S4-05	C1S4-05	C1S4-05	C1S4-06	C1S4-06
Field Sample Identifier		SO-H-C1S4-05-B-D	SO-H-C1S4-05-C	SO-H-C1S4-05-C-D	SO-H-C1S4-06-A	SO-H-C1S4-06-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	1.5-2.5	1.5-2.5	0.0-0.5	0.5-1.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units	Field Duplicate		Field Duplicate		
RADIONUCLIDES						
RADIUM-226	*PCI/G*	1.283	1.124	1.031	0.563	6.089
RADIUM-228	*PCI/G*	1.289	0.987	0.611	0.632	0.821
THORIUM-228	*PCI/G*	0.71	0.829	0.626	0.634	0.875
THORIUM-230	*PCI/G*	0.887	0.967	0.727	0.77	1.702
THORIUM-232	*PCI/G*	0.965	0.786	0.719	0.527	0.656
URANIUM-234	*PCI/G*	1.262	0.882	0.815	0.584	8.252
URANIUM-235	*PCI/G*	0.04 U	0.044 U	0.023 U	0.021 U	0.292
URANIUM-238	*PCI/G*	1.089	1.106	0.956	0.676	8.023

The qualifiers shown were assigned during chemistry validation.

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J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S4-06	C1S4-07	C1S4-07	C1S4-07	C1S4-08
Field Sample Identifier		SO-H-C1S4-06-C	SO-H-C1S4-07-A	SO-H-C1S4-07-B	SO-H-C1S4-07-C	SO-H-C1S4-08-A
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units					
RADIONUCLIDES						
RADIUM-226	PCI/G	5.729	0.993	2.029	1.19	0.877
RADIUM-228	PCI/G	0.62	0.679	0.556	0.772	0.514
THORIUM-228	PCI/G	0.594	0.868	0.83	1.046	0.731
THORIUM-230	PCI/G	0.962	0.773	2.93	0.954	0.649
THORIUM-232	PCI/G	0.617	0.811	1.023	1.002	0.666
URANIUM-234	PCI/G	6.184	0.505	1.041	1.346	0.526
URANIUM-235	PCI/G	0.211	0.01 U	0.026 U	0.064	0.006 U
URANIUM-238	PCI/G	6.129	0.568	0.939	1.202	0.499

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S4-08	C1S4-08	C1S4-09	C1S4-09	C1S4-09
Field Sample Identifier		SO-H-C1S4-08-B	SO-H-C1S4-08-C	SO-H-C1S4-09-A	SO-H-C1S4-09-A-D	SO-H-C1S4-09-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	1.5-2.5	0.0-0.5	0.0-0.5	0.5-1.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units				Field Duplicate	
RADIONUCLIDES						
RADIUM-226	PCI/G	0.806	1.967	1.093	0.702	0.99
RADIUM-228	PCI/G	0.297 U	0.775	0.747	0.971	0.943
THORIUM-228	PCI/G	0.891	0.879	0.989	0.892	0.724
THORIUM-230	PCI/G	0.89	0.74	0.777	0.941	0.942
THORIUM-232	PCI/G	0.757	0.63	1.109	1.109	1.053
URANIUM-234	PCI/G	1.459	2.081	0.6	0.88	0.795
URANIUM-235	PCI/G	0.027 U	0.086	0.009 U	0.009 U	-0.021 U
URANIUM-238	PCI/G	1.527	1.938	0.652	0.65	1.17

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S4-09	C1S4-09	C1S4-09	C1S4-10	C1S4-10
Field Sample Identifier		SO-H-C1S4-09-B-D	SO-H-C1S4-09-C	SO-H-C1S4-09-C-D	SO-H-C1S4-10-A	SO-H-C1S4-10-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	1.5-2.5	1.5-2.5	0.0-0.5	0.5-1.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units	Field Duplicate		Field Duplicate		
RADIONUCLIDES						
RADIUM-226	*PCI/G*	0.55	1.531	1.579	0.751	1.022
RADIUM-228	*PCI/G*	1.537	0.59	1.092	0.913	0.535
THORIUM-228	*PCI/G*	1.007	0.713	0.906	0.763	0.632
THORIUM-230	*PCI/G*	1.277	0.745	1.067	0.684	0.215
THORIUM-232	*PCI/G*	0.988	0.757	0.71	0.518	-0.059 U
URANIUM-234	*PCI/G*	1.172	2.168	2.073	0.475	0.821
URANIUM-235	*PCI/G*	0.005 U	0.014 U	0.095	0.019 U	0.014 U
URANIUM-238	*PCI/G*	1.209	2.437	2.245	0.581	0.758

The qualifiers shown were assigned during chemistry validation.

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J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S4-10	C1S4-11	C1S4-11	C1S4-11	C1S4-12
Field Sample Identifier		SO-H-C1S4-10-C	SO-H-C1S4-11-A	SO-H-C1S4-11-B	SO-H-C1S4-11-C	SO-H-C1S4-12-A
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units					
RADIONUCLIDES						
RADIUM-226	PCI/G	1.168	0.912	1.169	1.149	0.764
RADIUM-228	PCI/G	0.663	0.649	0.698	1.454	0.4
THORIUM-228	PCI/G	1.085	0.876	1.026	0.976	0.775
THORIUM-230	PCI/G	0.961	0.764	1.095	0.933	0.66
THORIUM-232	PCI/G	0.973	0.677	0.953	1.131	0.674
URANIUM-234	PCI/G	2.704	0.704	1.17	1.235	3.793
URANIUM-235	PCI/G	0.11	0.045	0.038	0.03 U	0.069
URANIUM-238	PCI/G	2.567	0.772	1.124	1.004	4.051

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S4-12	C1S4-12	C1S4-13	C1S4-13	C1S4-13
Field Sample Identifier		SO-H-C1S4-12-B	SO-H-C1S4-12-C	SO-H-C1S4-13-A	SO-H-C1S4-13-B	SO-H-C1S4-13-C
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5
Date of Sample		12/19/18	12/19/18	12/20/18	12/20/18	12/20/18
Parameter	Units					
RADIONUCLIDES						
RADIUM-226	PCI/G	1.113	0.845	0.786	1.026	1.368
RADIUM-228	PCI/G	0.823	0.538	0.811	0.642	0.669
THORIUM-228	PCI/G	0.681	0.815	0.875	0.835	0.894
THORIUM-230	PCI/G	0.896	0.694	1.104	1.191	1.196
THORIUM-232	PCI/G	0.705	0.64	0.587	0.774	0.911
URANIUM-234	PCI/G	0.968	3.478	0.73	1.642	1.707
URANIUM-235	PCI/G	0.01 U	0.068	-0.087 U	0.016 U	0.068 U
URANIUM-238	PCI/G	1.299	3.254	0.741	1.689	1.855

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S4-14	C1S4-14	C1S4-14	C2-01	C2-01
Field Sample Identifier		SO-H-C1S4-14-A	SO-H-C1S4-14-B	SO-H-C1S4-14-C	SO-H-C2-01-A	SO-H-C2-01-A-D
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5	0.0-0.5
Date of Sample		12/20/18	12/20/18	12/20/18	12/19/18	12/19/18
Parameter	Units					Field Duplicate
RADIONUCLIDES						
RADIUM-226	*PCI/G*	0.772	0.979	0.431	0.48	0.885
RADIUM-228	*PCI/G*	0.25 U	0.973	0.364	0.564	0.793
THORIUM-228	*PCI/G*	0.669	0.738	0.544	0.379	0.517
THORIUM-230	*PCI/G*	0.525	0.895	0.592	0.49	0.922
THORIUM-232	*PCI/G*	0.467	0.933	0.473	0.489	0.634
URANIUM-234	*PCI/G*	0.416	0.709	0.497	0.545	0.737
URANIUM-235	*PCI/G*	0.028 U	0.004 U	0.007 U	0.042 U	0.056
URANIUM-238	*PCI/G*	0.385	0.606	0.323	0.448	0.59

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C2-01	C2-01	C2-01	C2-01	C2-02
Field Sample Identifier		SO-H-C2-01-B	SO-H-C2-01-B-D	SO-H-C2-01-C	SO-H-C2-01-C-D	SO-H-C2-02-A
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	0.5-1.5	1.5-2.5	1.5-2.5	0.0-0.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units		Field Duplicate		Field Duplicate	
RADIONUCLIDES						
RADIUM-226	PCI/G	0.774	0.851	0.517	0.782	0.954
RADIUM-228	PCI/G	0.439	0.871	0.399	0.626	0.993
THORIUM-228	PCI/G	0.748	0.433	0.63	0.581	0.572
THORIUM-230	PCI/G	0.587	0.281	0.85	0.81	0.581
THORIUM-232	PCI/G	0.444	0.667	0.757	0.478	0.577
URANIUM-234	PCI/G	0.616	0.683	0.679	0.588	0.674
URANIUM-235	PCI/G	0.04 U	0.044	0.03 U	0.034	0.014 U
URANIUM-238	PCI/G	0.526	0.618	0.563	0.612	0.585

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C2-02	C2-02	C2-03	C2-03	C2-03
Field Sample Identifier		SO-H-C2-02-B	SO-H-C2-02-C	SO-H-C2-03-A	SO-H-C2-03-B	SO-H-C2-03-C
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units					
RADIONUCLIDES						
RADIUM-226	PCI/G	0.75	0.57	0.878	0.767	0.87
RADIUM-228	PCI/G	0.834	0.761	0.888	0.54	0.527
THORIUM-228	PCI/G	0.57	0.833	0.73	0.628	0.537
THORIUM-230	PCI/G	0.776	0.832	0.674	0.512	0.713
THORIUM-232	PCI/G	0.7	0.63	0.617	0.517	0.557
URANIUM-234	PCI/G	0.603	0.66	0.781	0.624	0.558
URANIUM-235	PCI/G	0.034	0.02 U	0.011 U	0.018 U	0.03 U
URANIUM-238	PCI/G	0.646	0.549	0.635	0.602	0.715

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C2-04	C2-04	C2-04	C2-05	C2-05
Field Sample Identifier		SO-H-C2-04-A	SO-H-C2-04-B	SO-H-C2-04-C	SO-H-C2-05-A	SO-H-C2-05-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units					
RADIONUCLIDES						
RADIUM-226	PCI/G	0.751	0.807	1.016	0.77	1.036
RADIUM-228	PCI/G	0.365	0.804	0.962	0.656	0.913
THORIUM-228	PCI/G	0.591	0.729	0.679	0.573	0.853
THORIUM-230	PCI/G	0.621	0.78	0.812	0.609	0.762
THORIUM-232	PCI/G	0.342	0.822	0.677	0.649	0.972
URANIUM-234	PCI/G	0.653	0.442	0.659	0.532	0.75
URANIUM-235	PCI/G	0.006 U	-0.107 U	0.009 U	0.03 U	0.037 U
URANIUM-238	PCI/G	0.767	0.312	0.753	0.501	0.665

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C2-05	C2-06	C2-06	C2-06	C2-07
Field Sample Identifier		SO-H-C2-05-C	SO-H-C2-06-A	SO-H-C2-06-B	SO-H-C2-06-C	SO-H-C2-07-A
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units					
RADIONUCLIDES						
RADIUM-226	PCI/G	0.671	0.831	0.815	1.073	0.692
RADIUM-228	PCI/G	0.568	0.948	0.928	0.652	0.432 U
THORIUM-228	PCI/G	0.72	0.662	0.696	0.779	0.381
THORIUM-230	PCI/G	1.193	0.87	0.598	1.099	0.434
THORIUM-232	PCI/G	0.967	0.806	0.482	0.662	0.154 U
URANIUM-234	PCI/G	0.915	0.535	0.728	0.82	0.484
URANIUM-235	PCI/G	0.049	0.037	0.018 J	0.022 U	0.018 U
URANIUM-238	PCI/G	0.895	0.636	0.76	0.821	0.55

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C2-07	C2-07	C2-08	C2-08	C2-08
Field Sample Identifier		SO-H-C2-07-B	SO-H-C2-07-C	SO-H-C2-08-A	SO-H-C2-08-B	SO-H-C2-08-C
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	3.5-4.5	0.0-0.5	0.5-1.5	1.5-2.5
Date of Sample		12/19/18	12/19/18	12/20/18	12/20/18	12/20/18
Parameter	Units					
RADIONUCLIDES						
RADIUM-226	PCI/G	0.774	0.679	0.516	0.761	0.943
RADIUM-228	PCI/G	0.557	0.224 U	0.574	0.882	0.887
THORIUM-228	PCI/G	0.324	0.049 U	0.858	0.824	0.614
THORIUM-230	PCI/G	0.452	0.436	1.049	0.812	0.874
THORIUM-232	PCI/G	0.434	0.198	0.699	0.649	0.572
URANIUM-234	PCI/G	0.421	0.746	0.489	0.704	0.647
URANIUM-235	PCI/G	0.008 U	0.04	0.019 U	0.032 U	0.059
URANIUM-238	PCI/G	0.518	0.864	0.589	0.691	0.643

The qualifiers shown were assigned during chemistry validation.

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J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C2-09	C2-09	C2-09	C2-10	C2-10
Field Sample Identifier		SO-H-C2-09-A	SO-H-C2-09-B	SO-H-C2-09-C	SO-H-C2-10-A	SO-H-C2-10-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5
Date of Sample		12/20/18	12/20/18	12/20/18	12/19/18	12/19/18
Parameter	Units					
RADIONUCLIDES						
RADIUM-226	PCI/G	0.774	0.806	0.89	0.623	0.896
RADIUM-228	PCI/G	0.794	1.024	0.923	0.509	0.914
THORIUM-228	PCI/G	0.74	0.705	1.012	0.817	0.903
THORIUM-230	PCI/G	0.656	0.604	0.386	0.879	0.999
THORIUM-232	PCI/G	0.588	0.61	0.58	0.495	1.068
URANIUM-234	PCI/G	0.625	0.543	0.608	0.632	0.588
URANIUM-235	PCI/G	0.037 U	0.023 U	0.046 U	0.039 U	0.043 U
URANIUM-238	PCI/G	0.646	0.563	0.676	0.652	0.501

The qualifiers shown were assigned during chemistry validation.

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J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C2-10	C2-11	C2-11	C2-11	C2-12
Field Sample Identifier		SO-H-C2-10-C	SO-H-C2-11-A	SO-H-C2-11-B	SO-H-C2-11-C	SO-H-C2-12-A
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	0.0-0.5	0.5-1.5	2.5-3.5	0.0-0.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units					
RADIONUCLIDES						
RADIUM-226	PCI/G	0.762	0.844	0.9	0.74	0.904
RADIUM-228	PCI/G	0.631	0.592	0.946	1.152	0.886
THORIUM-228	PCI/G	0.834	0.663	1.073	1.039	0.99
THORIUM-230	PCI/G	0.891	1.043	0.999	1.184	1.262
THORIUM-232	PCI/G	0.544	0.72	0.775	1.224	0.809
URANIUM-234	PCI/G	0.47	0.674	0.747	0.604	1.394
URANIUM-235	PCI/G	0.046 U	0.043	0.022 J	0.024 U	0.079
URANIUM-238	PCI/G	0.646	0.656	0.66	0.58	1.321

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C2-12	C2-12	C2-13	C2-13	C2-13
Field Sample Identifier		SO-H-C2-12-B	SO-H-C2-12-C	SO-H-C2-13-A	SO-H-C2-13-B	SO-H-C2-13-C
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5
Date of Sample		12/19/18	12/19/18	12/20/18	12/20/18	12/20/18
Parameter	Units					
RADIONUCLIDES						
RADIUM-226	PCI/G	0.805	1.164	1.089	1.369	3.17
RADIUM-228	PCI/G	0.943	0.91	0.582	1.029	0.649
THORIUM-228	PCI/G	0.966	0.835	0.977	0.668	0.659
THORIUM-230	PCI/G	1.088	1.272	0.562	0.738	1.744
THORIUM-232	PCI/G	0.744	0.747	0.687	0.702	0.692
URANIUM-234	PCI/G	1.648	1.459	0.537	0.655	1.65
URANIUM-235	PCI/G	0.052 U	0.018 U	0.024 U	0.055 U	0.063 U
URANIUM-238	PCI/G	1.953	1.379	0.648	0.708	1.56

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C2-14	C2-14	C2-14	C2-15	C2-15
Field Sample Identifier		SO-H-C2-14-A	SO-H-C2-14-B	SO-H-C2-14-C	SO-H-C2-15-A	SO-H-C2-15-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5
Date of Sample		12/20/18	12/20/18	12/20/18	12/20/18	12/20/18
Parameter	Units					
RADIONUCLIDES						
RADIUM-226	PCI/G	1.153	0.989	1.698	0.754	1.045
RADIUM-228	PCI/G	0.621	0.911	0.361	0.503	0.533
THORIUM-228	PCI/G	0.677	0.689	0.816	0.986	0.717
THORIUM-230	PCI/G	0.555	0.672	0.793	1.074	0.974
THORIUM-232	PCI/G	0.223	0.641	0.681	0.917	0.756
URANIUM-234	PCI/G	0.701	0.348	0.889	0.583	0.552
URANIUM-235	PCI/G	0.018 U	-0.019 U	0.01 U	0.024 U	0.012 U
URANIUM-238	PCI/G	0.525	0.347	0.964	0.508	0.544

The qualifiers shown were assigned during chemistry validation.

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J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C2-15	C2-16	C2-16	C2-16	C2-17
Field Sample Identifier		SO-H-C2-15-C	SO-H-C2-16-A	SO-H-C2-16-B	SO-H-C2-16-C	SO-H-C2-17-A
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5
Date of Sample		12/20/18	12/20/18	12/20/18	12/20/18	12/19/18
Parameter	Units					
RADIONUCLIDES						
RADIUM-226	PCI/G	0.631	0.661	0.586	0.573	0.229
RADIUM-228	PCI/G	0.685	0.5	0.581	0.527	0.106 U
THORIUM-228	PCI/G	0.795	0.759	0.338	0.492	0.112
THORIUM-230	PCI/G	0.655	1.007	0.912	0.568	0.365
THORIUM-232	PCI/G	0.653	0.704	0.023 U	0.431	0.111 U
URANIUM-234	PCI/G	0.434	R	0.498	0.5	0.253
URANIUM-235	PCI/G	0.008 U	R	0.018 U	0.032 U	-0.008 U
URANIUM-238	PCI/G	0.432	R	0.459	0.524	0.275

The qualifiers shown were assigned during chemistry validation.

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J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C2-17	C2-17	CP-01	CP-01	CP-01
Field Sample Identifier		SO-H-C2-17-B	SO-H-C2-17-C	SO-H-CP01-A	SO-H-CP01-B	SO-H-CP01-C
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units					
RADIONUCLIDES						
RADIUM-226	PCI/G	1.599	1.126	0.871	0.713	1.076
RADIUM-228	PCI/G	0.869	1.091	0.751	0.256 U	0.644
THORIUM-228	PCI/G	0.701	0.766	0.919	0.695	1.007
THORIUM-230	PCI/G	1.049	0.77	0.781	0.353	0.842
THORIUM-232	PCI/G	0.7	1.037	0.77	0.201 U	0.78
URANIUM-234	PCI/G	0.812	1.22	0.632	0.571	0.803
URANIUM-235	PCI/G	0.044 U	0.073	0.058	0.024 U	0.058
URANIUM-238	PCI/G	0.815	1.12	0.713	0.688	0.701

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		CP-02	CP-02	CP-02	HOTSPOT-01	HOTSPOT-01
Field Sample Identifier		SO-H-CP02-A	SO-H-CP02-B	SO-H-CP02-C	SO-H-HTSP-01A-A	SO-H-HTSP-01A-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/20/18	12/20/18
Parameter	Units					
RADIONUCLIDES						
RADIUM-226	PCI/G	0.598	0.954	1.135	2.853	1.535
RADIUM-228	PCI/G	1.077	1.042	0.83	1.117	1.434
THORIUM-228	PCI/G	0.747	0.526	1.111	1.003	0.813
THORIUM-230	PCI/G	0.964	0.54	0.673	4.099	1.745
THORIUM-232	PCI/G	0.644	0.454	0.82	0.805	0.995
URANIUM-234	PCI/G	0.484	0.95	0.764	0.705	1.381
URANIUM-235	PCI/G	0.101	0.008 U	0.018 U	0.023 J	0.031 U
URANIUM-238	PCI/G	0.434	0.766	0.744	0.796	1.13

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		HOTSPOT-01	HOTSPOT-02	HOTSPOT-02	HOTSPOT-02	HOTSPOT-02
Field Sample Identifier		SO-H-HTSP-01A-C	SO-H-HTSP-01-A	SO-H-HTSP-01-A-D	SO-H-HTSP-01-B	SO-H-HTSP-01-B-D
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	0.0-0.5	0.0-0.5	0.5-1.5	0.5-1.5
Date of Sample		12/20/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units			Field Duplicate		Field Duplicate
RADIONUCLIDES						
RADIUM-226	*PCI/G*	1.619	22.638	16.223	143.17	155.15
RADIUM-228	*PCI/G*	1.195	1.012	0.688	0.792 U	0.816 U
THORIUM-228	*PCI/G*	1.125	0.779	0.785	1.282	1.085
THORIUM-230	*PCI/G*	1.358	13.74 J	26.882 J	210.08	228.693
THORIUM-232	*PCI/G*	0.965	0.653	0.775	0.726	0.895
URANIUM-234	*PCI/G*	1.404	0.845	1.223	3.685 J	R
URANIUM-235	*PCI/G*	0.033 U	0.007 U	0.003 U	0.076	R
URANIUM-238	*PCI/G*	1.404	1.141	0.905	2.133 J	R

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J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		HOTSPOT-02	HOTSPOT-02	HOTSPOT-03	HOTSPOT-03	HOTSPOT-03
Field Sample Identifier		SO-H-HTSP-01-C	SO-H-HTSP-01-C-D	SO-H-HTSP-03-A	SO-H-HTSP-03-B	SO-H-HTSP-03-C
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5
Date of Sample		12/19/18	12/19/18	12/21/18	12/21/18	12/21/18
Parameter	Units		Field Duplicate			
RADIONUCLIDES						
RADIUM-226	*PCI/G*	1.547	1.23	1.547	2.465	1.204
RADIUM-228	*PCI/G*	1.515	1.046	0.654	0.733	1.106
THORIUM-228	*PCI/G*	1.001	0.739	0.846	1.098	0.805
THORIUM-230	*PCI/G*	1.289	0.92	1.624	2.922	1.108
THORIUM-232	*PCI/G*	0.938	0.769	0.895	1.001	0.858
URANIUM-234	*PCI/G*	1.804	1.851	1.091	1.346	1.357
URANIUM-235	*PCI/G*	0.045	0.075	0.008 U	0.085	0.072
URANIUM-238	*PCI/G*	1.362	1.674	1.131	1.417	1.22

The qualifiers shown were assigned during chemistry validation.

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J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		HOTSPOT-04	HOTSPOT-04	HOTSPOT-04	HOTSPOT-05	HOTSPOT-05
Field Sample Identifier		SO-H-HTSP-04-A	SO-H-HTSP-04-B	SO-H-HTSP-04-C	SO-H-HTSP-05-A	SO-H-HTSP-05-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5
Date of Sample		12/21/18	12/21/18	12/21/18	12/21/18	12/21/18
Parameter	Units					
RADIONUCLIDES						
RADIUM-226	PCI/G	3.499	2.64	1.545	5.987	2.966
RADIUM-228	PCI/G	1.006	0.807	1.294	1.276	0.7
THORIUM-228	PCI/G	0.739	0.798	0.786	0.623	0.792
THORIUM-230	PCI/G	1.242	0.957	1.138	1.372	1.305
THORIUM-232	PCI/G	0.715	1.021	0.908	0.794	0.858
URANIUM-234	PCI/G	1.381	1.341	1.313	1.92	1.304
URANIUM-235	PCI/G	0.034	0.042	0.054	0.108	0.006 U
URANIUM-238	PCI/G	1.601	1.245	1.155	1.704	1.257

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		HOTSPOT-05	HOTSPOT-06	HOTSPOT-06	HOTSPOT-06	HOTSPOT-07
Field Sample Identifier		SO-H-HTSP-05-C	SO-H-HTSP-06-A	SO-H-HTSP-06-B	SO-H-HTSP-06-C	SO-H-HTSP-07-A
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5
Date of Sample		12/21/18	12/21/18	12/21/18	12/21/18	12/21/18
Parameter	Units					
RADIONUCLIDES						
RADIUM-226	PCI/G	2.072	17.203	101.25	2.029	6.69
RADIUM-228	PCI/G	0.745	0.597 U	1.226	0.567	1.367
THORIUM-228	PCI/G	0.851	0.644	0.934	0.733	0.93
THORIUM-230	PCI/G	1.059	7.76	13.853	0.958	2.555
THORIUM-232	PCI/G	0.908	0.702	0.812	0.808	0.799
URANIUM-234	PCI/G	1.148	0.663	1.118 J	1.309	1.757
URANIUM-235	PCI/G	0.024 J	0.041 U	0.011 UJ	0.027 J	0.092
URANIUM-238	PCI/G	1.117	0.802	0.989 J	1.242	2.242

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		HOTSPOT-07	HOTSPOT-07	HOTSPOT-08	HOTSPOT-08	HOTSPOT-08
Field Sample Identifier		SO-H-HTSP-07-B	SO-H-HTSP-07-C	SO-H-HTSP-08-A	SO-H-HTSP-08-B	SO-H-HTSP-08-C
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5
Date of Sample		12/21/18	12/21/18	12/21/18	12/21/18	12/21/18
Parameter	Units					
RADIONUCLIDES						
RADIUM-226	PCI/G	4.282	7.189	1.569	0.614	0.587
RADIUM-228	PCI/G	0.902	0.9	0.644	1.21	0.335 U
THORIUM-228	PCI/G	0.952	1.215	0.789	0.635	0.614
THORIUM-230	PCI/G	2.102	1.639	1.889	0.885	0.845
THORIUM-232	PCI/G	0.704	0.751	0.662	0.849	0.57
URANIUM-234	PCI/G	2.144	2.126	0.651	0.627	0.651
URANIUM-235	PCI/G	0.099	0.055	0.022 U	0.012 U	0.03 U
URANIUM-238	PCI/G	2.041	1.945	0.707	0.76	0.466

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		HOTSPOT-09	HOTSPOT-09	HOTSPOT-09	HOTSPOT-10	HOTSPOT-10
Field Sample Identifier		SO-H-HTSP-09-A	SO-H-HTSP-09-B	SO-H-HTSP-09-C	SO-H-HTSP-10-A	SO-H-HTSP-10-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5
Date of Sample		12/21/18	12/21/18	12/21/18	12/21/18	12/21/18
Parameter	Units					
RADIONUCLIDES						
RADIUM-226	PCI/G	1.431	0.566	0.718	4.025	1.674
RADIUM-228	PCI/G	0.995	0.399	0.435	1.106	0.852
THORIUM-228	PCI/G	0.72	0.67	0.685	0.741	0.783
THORIUM-230	PCI/G	0.854	0.663	0.456	1.812	0.771
THORIUM-232	PCI/G	0.592	0.466	0.661	0.677	0.651
URANIUM-234	PCI/G	1.165	0.559	0.437	1.065	1.525
URANIUM-235	PCI/G	0.025 U	0.024 U	-0.017 U	-0.02 U	0.065
URANIUM-238	PCI/G	1.073	0.588	0.793	1.287	1.099

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		HOTSPOT-10	HOTSPOT-11	HOTSPOT-11	HOTSPOT-11	HOTSPOT-11
Field Sample Identifier		SO-H-HTSP-10-C	SO-H-HTSP-11-A	SO-H-HTSP-11-A-D	SO-H-HTSP-11-B	SO-H-HTSP-11-B-D
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	0.0-0.5	0.0-0.5	0.5-1.5	0.5-1.5
Date of Sample		12/21/18	01/23/19	01/23/19	01/23/19	01/23/19
Parameter	Units			Field Duplicate		Field Duplicate
RADIONUCLIDES						
RADIUM-226	PCI/G	1.297	3.485	3.116	1.137	1.217
RADIUM-228	PCI/G	1.276	0.796	0.905	1.138	1.196
THORIUM-228	PCI/G	0.698	0.94	0.885	0.861	0.795
THORIUM-230	PCI/G	0.827	1.2	1.19	0.596	0.712
THORIUM-232	PCI/G	0.814	0.576	0.839	0.813	0.827
URANIUM-234	PCI/G	0.928	1.02	1.03	0.812	0.902
URANIUM-235	PCI/G	0.015 U	0.085	0.05 U	0.086	0.052
URANIUM-238	PCI/G	1.041	1.19	1.03	1.05	1.06

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-2
SOIL ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		HOTSPOT-11	HOTSPOT-11	HOTSPOT-12	HOTSPOT-12	HOTSPOT-12
Field Sample Identifier		SO-H-HTSP-11-C	SO-H-HTSP-11-C-D	SO-H-HTSP-12-A	SO-H-HTSP-12-B	SO-H-HTSP-12-C
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5
Date of Sample		01/23/19	01/23/19	01/23/19	01/23/19	01/23/19
Parameter	Units		Field Duplicate			
RADIONUCLIDES						
RADIUM-226	*PCI/G*	0.74	0.662	8.753	0.984	1.056
RADIUM-228	*PCI/G*	0.586	0.872	0.973	0.679	0.754
THORIUM-228	*PCI/G*	0.901	0.887	1.06	1.13	0.933
THORIUM-230	*PCI/G*	0.766	0.646	1.09	0.993	0.712
THORIUM-232	*PCI/G*	0.744	0.838	0.866	1.02	0.944
URANIUM-234	*PCI/G*	0.677	0.663	1.28	0.892	0.705
URANIUM-235	*PCI/G*	-0.017 U	0.037 U	0.066	0.019 U	0.034 U
URANIUM-238	*PCI/G*	0.755	0.845	1.3	1.04	0.795

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J - The reported concentration is an estimated value.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-3
GROUNDWATER ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1-20-BP3	C1-2-A100-BP4	C1-2-BP1
Field Sample Identifier		GW-H-C1-20-BP3	GW-H-C1-2-A100-BP4	GW-H-C1-2-BP1
Sample Matrix		Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-
Date of Sample		12/11/18	12/11/18	12/11/18
Parameter	**Units**			
RADIONUCLIDES				
RADIUM-226	PCI/L	0.145	0.067 U	0.194
RADIUM-228	PCI/L	0.696 J+	0.405 U	1.046 J+
THORIUM-228	PCI/L	0.009 U	0.09	0.015 U
THORIUM-230	PCI/L	-0.008 U	-0.011 U	-0.007 U
THORIUM-232	PCI/L	0.008 U	-0.019 U	-0.014 U
URANIUM-234	PCI/L	0.727	10.276	6.139
URANIUM-235	PCI/L	0.007 U	0.152	0.161
URANIUM-238	PCI/L	0.754	7.49	5.203
RADIONUCLIDES (FILTERED)				
RADIUM-226	PCI/L	0.145	-0.022 U	0.1 U
RADIUM-228	PCI/L	0.375 U	0.593 U	0.665 J+
THORIUM-228	PCI/L	-0.008 U	R	0 U
THORIUM-230	PCI/L	0.004 U	R	-0.015 U
THORIUM-232	PCI/L	0.008 U	R	-0.004 U
URANIUM-234	PCI/L	0.737	10.109	8.359
URANIUM-235	PCI/L	0.016 U	0.165	0.269
URANIUM-238	PCI/L	0.545	7.327	6.794
MISCELLANEOUS				
ALKALINITY, TOTAL	MG/L	217	652	537
BROMIDE	UG/L	67 U	67 U	175
CHLORIDE (AS CL)	UG/L	4,420	330,000	20,200

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-3
GROUNDWATER ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1-20-BP3	C1-2-A100-BP4	C1-2-BP1
Field Sample Identifier		GW-H-C1-20-BP3	GW-H-C1-2-A100-BP4	GW-H-C1-2-BP1
Sample Matrix		Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-
Date of Sample		12/11/18	12/11/18	12/11/18
Parameter	Units			
MISCELLANEOUS				
DISSOLVED SOLIDS, TOTAL	*MG/L*	330	2,910	1,070
FLUORIDE	*UG/L*	389	353	248
NITROGEN, NITRATE (AS N)	*UG/L*	33 U	33 U	33 U
NITROGEN, NITRITE (AS N)	*UG/L*	33 U	33 U	33 U
PHOSPHORUS, TOTAL ORTHOPHOSPHATE (AS PO4)	*UG/L*	67 U	130	67 U
SULFATE	*UG/L*	55,400	1,230,000	353,000

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

TABLE 4-4
PONDED WATER ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		WS-01	WS-02	WS-03	WS-04	WS-05
Field Sample Identifier		SW-H-C2-08	SW-H-C2-10	SW-H-C2-11a	SW-H-C1S1-04	SW-H-C1S1-10
Sample Matrix		Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
Depth Interval (ft)		-	-	-	-	-
Date of Sample		12/03/18	11/30/18	11/30/18	11/29/18	11/30/18
Parameter	Units					
RADIONUCLIDES						
RADIUM-226	PCI/L	0.102 U	0.022 U	0.099 U	0.044 U	0.076 U
RADIUM-228	PCI/L	0.282 U	0.504 U	0.053 U	0.055 U	0.091 U
THORIUM-228	PCI/L	1.087	0.221	0.068 U	0.036 U	0.074 U
THORIUM-230	PCI/L	0.04 U	-0.049 U	0.006 U	0.02 U	0.079 U
THORIUM-232	PCI/L	-0.053 U	-0.005 U	-0.022 U	-0.01 U	0.026 U
URANIUM-234	PCI/L	R	3.207	1.213	2.952	1.328
URANIUM-235	PCI/L	R	0.177	0.038 U	0.109 U	0.026 U
URANIUM-238	PCI/L	R	2.995	1.423	2.98	1.32
RADIONUCLIDES (FILTERED)						
RADIUM-226	PCI/L	0.029 U	0.062 U	0.069 U	0.14 J+	0.048 U
RADIUM-228	PCI/L	-0.405 U	0.451 U	0.284 U	0.079 U	0.361 U
THORIUM-228	PCI/L	0.599	0.252	0.281	0.123	0.44
THORIUM-230	PCI/L	0 U	0.032	0.03 J	0.052	0.034
THORIUM-232	PCI/L	0.011 U	0 U	0.01 U	0 U	0.008 U
URANIUM-234	PCI/L	1.516	3.871	1.396	3.605	1.143
URANIUM-235	PCI/L	0.019 U	0.078 U	0.04 U	0.109	0.063 U
URANIUM-238	PCI/L	1.509	3.603	1.196	2.565	1.161
MISCELLANEOUS						
ALKALINITY, TOTAL	MG/L	293	Not Analyzed	Not Analyzed	299	Not Analyzed
BROMIDE	UG/L	67 U	Not Analyzed	Not Analyzed	67 U	Not Analyzed
CHLORIDE (AS CL)	UG/L	8,430	Not Analyzed	Not Analyzed	14,000	Not Analyzed

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.

TABLE 4-4
PONDED WATER ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		WS-01	WS-02	WS-03	WS-04	WS-05
Field Sample Identifier		SW-H-C2-08	SW-H-C2-10	SW-H-C2-11a	SW-H-C1S1-04	SW-H-C1S1-10
Sample Matrix		Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
Depth Interval (ft)		-	-	-	-	-
Date of Sample		12/03/18	11/30/18	11/30/18	11/29/18	11/30/18
Parameter	Units					
MISCELLANEOUS						
DISSOLVED SOLIDS, TOTAL	MG/L	419	Not Analyzed	Not Analyzed	483	Not Analyzed
FLUORIDE	UG/L	174	Not Analyzed	Not Analyzed	429	Not Analyzed
NITROGEN, NITRATE (AS N)	UG/L	33 U	Not Analyzed	Not Analyzed	33 U	Not Analyzed
NITROGEN, NITRITE (AS N)	UG/L	33 U	Not Analyzed	Not Analyzed	33 U	Not Analyzed
PHOSPHORUS, TOTAL ORTHOPHOSPHATE (AS PO4)	UG/L	91	Not Analyzed	Not Analyzed	67 U	Not Analyzed
SULFATE	UG/L	65,700	Not Analyzed	Not Analyzed	105,000	Not Analyzed

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.

TABLE 4-4
PONDED WATER ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		WS-06	WS-07	WS-08	WS-08
Field Sample Identifier		SW-H-C1S2-03	SW-H-C1S2-07	SW-H-C1S2-11	SW-H-C1S2-11-D
Sample Matrix		Surface Water	Surface Water	Surface Water	Surface Water
Depth Interval (ft)		-	-	-	-
Date of Sample		11/29/18	11/30/18	11/29/18	11/29/18
Parameter	Units				Field Duplicate
RADIONUCLIDES					
RADIUM-226	PCI/L	0.1 J+	0.112 U	0.069 U	0.091 U
RADIUM-228	PCI/L	0.186 U	0.04 U	0.115 U	-0.01 U
THORIUM-228	PCI/L	0.031 U	0.846	0.005 U	0.014 U
THORIUM-230	PCI/L	0.026 U	-0.095 U	-0.072 U	0.046 U
THORIUM-232	PCI/L	-0.017 U	-0.088 U	-0.049 U	0 U
URANIUM-234	PCI/L	0.774	0.628	R	R
URANIUM-235	PCI/L	0.048 U	-0.043 U	R	R
URANIUM-238	PCI/L	0.813	0.7	R	R
RADIONUCLIDES (FILTERED)					
RADIUM-226	PCI/L	0.084 U	0.059 U	0.116 U	0.124 U
RADIUM-228	PCI/L	0.329 U	-0.14 U	-0.068 U	0.098 U
THORIUM-228	PCI/L	0.031 U	0.832	0.015 U	0.027 U
THORIUM-230	PCI/L	0.013 U	0.066	-0.01 U	0.021 U
THORIUM-232	PCI/L	0.007 U	0 U	0.005 U	0.005 U
URANIUM-234	PCI/L	1.049	0.664	R	R
URANIUM-235	PCI/L	0.014 U	0.025 U	R	R
URANIUM-238	PCI/L	0.774	0.718	R	R
MISCELLANEOUS					
ALKALINITY, TOTAL	MG/L	210	Not Analyzed	163	172
BROMIDE	UG/L	67 U	Not Analyzed	67 U	67 U
CHLORIDE (AS CL)	UG/L	5,260	Not Analyzed	6,420	6,340

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.

TABLE 4-4
PONDED WATER ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		WS-06	WS-07	WS-08	WS-08
Field Sample Identifier		SW-H-C1S2-03	SW-H-C1S2-07	SW-H-C1S2-11	SW-H-C1S2-11-D
Sample Matrix		Surface Water	Surface Water	Surface Water	Surface Water
Depth Interval (ft)		-	-	-	-
Date of Sample		11/29/18	11/30/18	11/29/18	11/29/18
Parameter	Units				Field Duplicate
MISCELLANEOUS					
DISSOLVED SOLIDS, TOTAL	*MG/L*	269	Not Analyzed	227	227
FLUORIDE	*UG/L*	113	Not Analyzed	105	97.7
NITROGEN, NITRATE (AS N)	*UG/L*	33 U	Not Analyzed	33 U	33 U
NITROGEN, NITRITE (AS N)	*UG/L*	33 U	Not Analyzed	33 U	33 U
PHOSPHORUS, TOTAL ORTHOPHOSPHATE (AS PO4)	*UG/L*	67 U	Not Analyzed	67 U	67 U
SULFATE	*UG/L*	5,760	Not Analyzed	7,590	7,230

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.

TABLE 4-5
CONCRETE SAMPLE ANALYTICAL RESULTS
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		CP-01	CP-01	CP-02
Field Sample Identifier		CON-H-CP-01-SLAB-A	CON-H-CP-01-SLAB-B	CON-H-CP-02-SLAB
Sample Matrix		Concrete	Concrete	Concrete
Depth Interval (ft)		0.0-0.5	0.5-1.5	0.0-0.5
Date of Sample		12/21/18	12/21/18	12/21/18
Parameter	Units			
RADIONUCLIDES				
RADIUM-226	PCI/G	0.453	1.754	0.356
RADIUM-228	PCI/G	0.38	1.062	0.186 U
THORIUM-228	PCI/G	0.672	0.664	0.306
THORIUM-230	PCI/G	0.491	1.54	0.291 J+
THORIUM-232	PCI/G	0.447	0.822	0.291
URANIUM-234	PCI/G	0.501	1.268	0.305
URANIUM-235	PCI/G	0.004 U	0.045	0.02 U
URANIUM-238	PCI/G	0.409	1.026	0.308

The qualifiers shown were assigned during chemistry validation.

U - Not detected above the reported quantitation limit.; R - The data is rejected.
J+: The result was an estimated quantity, but the result may be biased high due to associated lab QC criteria exceeding upper criteria limits.

Table 6-1. Radionuclide concentrations in environmental media representative of site-specific background conditions. Background threshold values (BTVs) were selected as the lesser of the maximum concentration and the estimated 95% upper tolerance limit with 95% coverage (UTL_{95-95}).

Surface Soil (0 to 0.5 ft bgs) Background Values (pCi/g)

Radionuclide	Detections	Sample Size	Arithmetic Mean	Maximum	UTL_{95-95}	UTL Estimation	Background Threshold Value	BTV Rationale
Radium-226	15	15	0.74	0.92	1.11	t-distribution (normal)	0.92	Max ≤ UTL
Radium-228	15	15	0.90	1.26	1.52	t-distribution (normal)	1.26	Max ≤ UTL
Thorium-228	15	15	1.09	1.64	1.75	t-distribution (normal)	1.64	Max ≤ UTL
Thorium-230	15	15	0.93	1.62	1.60	t-distribution (normal)	1.60	UTL ≤ Max
Thorium-232	15	15	0.88	1.24	1.46	t-distribution (normal)	1.24	Max ≤ UTL
Uranium-234	15	15	0.91	1.68	1.79	t-distribution (normal)	1.68	Max ≤ UTL
Uranium-235	0	15	0.05	0.10	0.12	t-distribution (normal)	0.10	Max ≤ UTL
Uranium-238	15	15	0.86	1.36	1.62	t-distribution (normal)	1.36	Max ≤ UTL

Subsurface Soil (> 0.5 ft bgs) Background Values (pCi/g)

Radionuclide	Detections	Sample Size	Arithmetic Mean	Maximum	UTL_{95-95}	UTL Estimation	Background Threshold Value	BTV Rationale
Radium-226	15	15	0.87	1.30	1.37	t-distribution (normal)	1.30	Max ≤ UTL
Radium-228	15	15	0.97	1.24	1.41	t-distribution (normal)	1.24	Max ≤ UTL
Thorium-228	15	15	1.13	1.55	1.83	t-distribution (normal)	1.55	Max ≤ UTL
Thorium-230	15	15	0.85	1.17	1.31	t-distribution (normal)	1.17	Max ≤ UTL
Thorium-232	15	15	0.94	1.24	1.51	t-distribution (normal)	1.24	Max ≤ UTL
Uranium-234	15	15	0.68	1.05	1.12	t-distribution (normal)	1.05	Max ≤ UTL
Uranium-235	0	15	0.04	0.06	0.09	t-distribution (normal)	0.06	Max ≤ UTL
Uranium-238	15	15	0.73	1.05	1.17	t-distribution (normal)	1.05	Max ≤ UTL

Groundwater Background Values (pCi/L)

Radionuclide	Detections	Sample Size	Arithmetic Mean	Maximum	UTL_{95-95}	UTL Estimation	Background Threshold Value	BTV Rationale
Radium-226	21	24	0.55	1.76	1.48	t-distribution (normal)	1.48	UTL ≤ Max
Radium-228	11	24	0.76	1.67	1.48	t-distribution (normal)	1.48	UTL ≤ Max
Thorium-228	1	24	0.12	0.32	0.32	t-distribution (normal)	0.32	UTL ≤ Max
Thorium-230	23	24	0.53	0.88	0.88	t-distribution (normal)	0.88	Max ≤ UTL
Thorium-232	9	24	0.08	0.26	0.30	Wilson-Hilferty (gamma)	0.26	Max ≤ UTL
Uranium-234	23	24	2.55	8.73	12.12	Wilson-Hilferty (gamma)	8.73	Max ≤ UTL
Uranium-235	5	24	0.17	0.72	0.72	order statistics (non-parametric)	0.72	UTL ≤ Max
Uranium-238	19	24	1.64	5.79	9.17	Wilson-Hilferty (gamma)	5.79	Max ≤ UTL

Surface Water Background Values (pCi/L)

Radionuclide	Detections	Sample Size	Arithmetic Mean	Maximum	UTL_{95-95}	UTL Estimation	Background Threshold Value	BTV Rationale
Radium-226	2	10	0.27	0.49	0.76	t-distribution (normal)	0.49	Max ≤ UTL
Radium-228	6	10	0.79	1.43	1.85	t-distribution (normal)	1.43	Max ≤ UTL
Thorium-228	0	10	0.12	0.26	0.31	Wilson-Hilferty (gamma)	0.26	Max ≤ UTL
Thorium-230	6	10	0.28	0.61	0.91	t-distribution (normal)	0.61	Max ≤ UTL
Thorium-232	0	10	0.02	0.07	0.12	t-distribution (normal)	0.07	Max ≤ UTL
Uranium-234	8	8	1.66	5.78	9.96	Wilson-Hilferty (gamma)	5.78	Max ≤ UTL
Uranium-235	2	8	0.17	0.53	0.72	t-distribution (normal)	0.53	Max ≤ UTL
Uranium-238	7	8	1.47	4.81	8.87	Wilson-Hilferty (gamma)	4.81	Max ≤ UTL

Table 6-2. Radionuclide concentrations measured in site environmental media and calculated upper tolerance limits (UTLs). UTLs were selected as the lesser of the maximum concentration and the estimated 95% upper tolerance limit with 95% coverage (UTL_{95-95}).

Site Surface Soil (0 to 0.5 ft bgs) Upper Tolerance Limits (pCi/g)

Radionuclide	Detections	Sample Size	Arithmetic Mean	Maximum	UTL_{95-95}	UTL_{95-95} Estimation	Upper Tolerance Limit	UTL Rationale
Radium-226	89	89	1.70	22.64	8.75	Order statistics (non-parametric)	8.75	UTL ≤ Max
Radium-228	83	89	0.82	1.42	1.40	t-distribution (normal)	1.40	UTL ≤ Max
Thorium-228	88	89	0.79	1.53	1.32	Order statistics (non-parametric)	1.32	UTL ≤ Max
Thorium-230	89	89	1.33	26.88	4.10	Order statistics (non-parametric)	4.10	UTL ≤ Max
Thorium-232	87	89	0.73	1.52	1.24	t-distribution (normal)	1.24	UTL ≤ Max
Uranium-234	88	88	0.81	3.79	1.76	Order statistics (non-parametric)	1.76	UTL ≤ Max
Uranium-235	25	88	0.03	0.11	0.09	Order statistics (non-parametric)	0.09	UTL ≤ Max
Uranium-238	88	88	0.83	4.05	1.70	Order statistics (non-parametric)	1.70	UTL ≤ Max

Site Subsurface Soil (> 0.5 ft bgs) Upper Tolerance Limits (pCi/g)

Radionuclide	Detections	Sample Size	Arithmetic Mean	Maximum	UTL_{95-95}	UTL_{95-95} Estimation	Upper Tolerance Limit	UTL Rationale
Radium-226	178	178	2.83	155.20	6.09	Order statistics (non-parametric)	6.09	UTL ≤ Max
Radium-228	173	178	0.87	1.54	1.48	Hawkins-Wixley (gamma)	1.48	UTL ≤ Max
Thorium-228	176	177	0.81	1.37	1.16	t-distribution (normal)	1.16	UTL ≤ Max
Thorium-230	175	177	2.34	228.70	2.10	Order statistics (non-parametric)	2.10	UTL ≤ Max
Thorium-232	173	177	0.78	1.35	1.22	Order statistics (non-parametric)	1.22	UTL ≤ Max
Uranium-234	178	178	1.13	8.25	2.37	t-distribution (lognormal)	2.37	UTL ≤ Max
Uranium-235	81	178	0.04	0.29	0.10	Order statistics (non-parametric)	0.10	UTL ≤ Max
Uranium-238	178	178	1.12	8.02	2.13	Order statistics (non-parametric)	2.13	UTL ≤ Max

Site Groundwater Upper Tolerance Limits (pCi/L)

Radionuclide	Detections	Sample Size	Arithmetic Mean	Maximum	UTL_{95-95}	UTL_{95-95} Estimation	Upper Tolerance Limit	UTL Rationale
Radium-226	2	3	0.14	0.19	0.63	t-distribution (normal)	0.19	Max ≤ UTL
Radium-228	2	3	0.72	1.05	3.17	t-distribution (normal)	1.05	Max ≤ UTL
Thorium-228	1	3	0.04	0.09	0.38	t-distribution (normal)	0.09	Max ≤ UTL
Thorium-230	0	3	-0.01	-0.01	0.01	t-distribution (normal)	-0.01	Max ≤ UTL
Thorium-232	0	3	-0.01	0.01	0.10	t-distribution (normal)	0.01	Max ≤ UTL
Uranium-234	3	3	5.71	10.28	42.38	t-distribution (normal)	10.28	Max ≤ UTL
Uranium-235	2	3	0.11	0.16	0.77	t-distribution (normal)	0.16	Max ≤ UTL
Uranium-238	3	3	4.48	7.49	30.71	t-distribution (normal)	7.49	Max ≤ UTL

Site Surface Water Upper Tolerance Limits (pCi/L)

Radionuclide	Detections	Sample Size	Arithmetic Mean	Maximum	UTL_{95-95}	UTL_{95-95} Estimation	Upper Tolerance Limit	UTL Rationale
Radium-226	1	8	0.08	0.11	0.30	Hawkins-Wixley (gamma)	0.11	Max ≤ UTL
Radium-228	0	8	0.17	0.50	1.15	Hawkins-Wixley (gamma)	0.50	Max ≤ UTL
Thorium-228	3	8	0.30	1.09	4.09	Hawkins-Wixley (gamma)	1.09	Max ≤ UTL
Thorium-230	0	8	0.01	0.08	0.19	t-distribution (normal)	0.08	Max ≤ UTL
Thorium-232	0	8	-0.02	0.03	0.09	t-distribution (normal)	0.03	Max ≤ UTL
Uranium-234	6	6	1.68	3.21	10.34	Hawkins-Wixley (gamma)	3.21	Max ≤ UTL
Uranium-235	1	6	0.06	0.18	0.34	t-distribution (normal)	0.18	Max ≤ UTL
Uranium-238	6	6	1.71	3.00	9.39	Hawkins-Wixley (gamma)	3.00	Max ≤ UTL

Table 6-3. Results of screening site radionuclide distributions against background radionuclide distributions. A radionuclide was considered to exceed background for a given environmental medium if either the central tendency or upper distribution of site concentrations exceeded that of background.

Surface Soil (0 to 0.5 ft bgs) Screening (pCi/g)

Radionuclide	Background Mean	Site Mean	Central tendency test result[1]	Background Threhold Value (BTV)	Site Upper Tolerance Limit (UTL)	Upper Distribution Comparison Result	Radionuclide exceeds background?
Radium-226	0.74	1.70	Site > Background	0.92	8.75	Site > Background	Yes
Radium-228	0.90	0.82	Site ≈ Background	1.26	1.40	Site > Background	Yes
Thorium-228	1.09	0.79	Site ≈ Background	1.64	1.32	Site ≤ Background	--
Thorium-230	0.93	1.33	Site ≈ Background	1.60	4.10	Site > Background	Yes
Thorium-232	0.88	0.73	Site ≈ Background	1.24	1.24	Site ≤ Background	--
Uranium-234	0.91	0.81	Site ≈ Background	1.68	1.76	Site > Background	Yes
Uranium-235	0.05	0.03	Site ≈ Background	0.10	0.09	Site ≤ Background	--
Uranium-238	0.86	0.83	Site ≈ Background	1.36	1.70	Site > Background	Yes

Subsurface Soil (> 0.5 ft bgs) Screening (pCi/g)

Radionuclide	Background Mean	Site Mean	Central tendency test result[1]	Background Threhold Value (BTV)	Site Upper Tolerance Limit (UTL)	Upper Distribution Comparison Result	Radionuclide exceeds background?
Radium-226	0.87	2.83	Site > Background	1.30	6.09	Site > Background	Yes
Radium-228	0.97	0.87	Site ≈ Background	1.24	1.48	Site > Background	Yes
Thorium-228	1.13	0.81	Site ≈ Background	1.55	1.16	Site ≤ Background	--
Thorium-230	0.85	2.34	Site ≈ Background	1.17	2.10	Site > Background	Yes
Thorium-232	0.94	0.78	Site ≈ Background	1.24	1.22	Site ≤ Background	--
Uranium-234	0.68	1.13	Site > Background	1.05	2.37	Site > Background	Yes
Uranium-235	0.04	0.04	Site ≈ Background	0.06	0.10	Site > Background	Yes
Uranium-238	0.73	1.12	Site > Background	1.05	2.13	Site > Background	Yes

Groundwater Screening (pCi/L)

Radionuclide	Background Mean	Site Mean	Central tendency test result[1]	Background Threhold Value (BTV)	Site Upper Tolerance Limit (UTL)	Upper Distribution Comparison Result	Radionuclide exceeds background?
Radium-226	0.55	0.14	Site ≈ Background	1.48	0.19	Site ≤ Background	--
Radium-228	0.76	0.72	Site ≈ Background	1.48	1.05	Site ≤ Background	--
Thorium-228	0.12	0.04	Site ≈ Background	0.32	0.09	Site ≤ Background	--
Thorium-230	0.53	-0.01	Site ≈ Background	0.88	-0.01	Site ≤ Background	--
Thorium-232	0.08	-0.01	Site ≈ Background	0.26	0.01	Site ≤ Background	--
Uranium-234	2.55	5.71	Site ≈ Background	8.73	10.28	Site > Background	Yes
Uranium-235	0.17	0.11	Site ≈ Background	0.72	0.16	Site ≤ Background	--
Uranium-238	1.64	4.48	Site > Background	5.79	7.49	Site > Background	Yes

Surface Water Screening (pCi/L)

Radionuclide	Background Mean	Site Mean	Central tendency test result[1]	Background Threhold Value (BTV)	Site Upper Tolerance Limit (UTL)	Upper Distribution Comparison Result	Radionuclide exceeds background?
Radium-226	0.27	0.08	Site ≈ Background	0.49	0.11	Site ≤ Background	--
Radium-228	0.79	0.17	Site ≈ Background	1.43	0.50	Site ≤ Background	--
Thorium-228	0.12	0.30	Site ≈ Background	0.26	1.09	Site > Background	Yes
Thorium-230	0.28	0.01	Site ≈ Background	0.61	0.08	Site ≤ Background	--
Thorium-232	0.02	-0.02	Site ≈ Background	0.07	0.03	Site ≤ Background	--
Uranium-234	1.66	1.68	Site ≈ Background	5.78	3.21	Site ≤ Background	--
Uranium-235	0.17	0.06	Site ≈ Background	0.53	0.18	Site ≤ Background	--
Uranium-238	1.47	1.71	Site ≈ Background	4.81	3.00	Site ≤ Background	--

[1] Wilcoxon-Mann-Whitney test (see text)

Table 6-4. Summary of selected radionuclides of potential concern (ROPCs) for each environmental medium.

Radionuclide	Surface Soil (0 to 0.15 m bgs)	Subsurface Soil (> 0.15 m bgs)	Groundwater	Surface Water
Radium-226	X	X		
Radium-228 †				
Thorium-228 †				
Thorium-230	X	X		
Thorium-232				
Uranium-234	X	X	X	
Uranium-235 ‡	X‡	X	X‡	
Uranium-238	X	X	X	

† Ra-228 and Th-228 were not considered ROPCs in site mediea despite having some site medium concentrations exceeding corresponding background concentrations (Table 6-3) because the thorium-232 decay chain was not identified as site contamination (see text for details).

‡ U-235 was additionally considered an ROPC in surface soil and groundwater because of its identification as an ROPC in subsurface soil and because uranium isotopes at the site are assumed to exist in natural ratios.

Table 6-5. Results of screening site total uranium mass concentrations against chemical screening criteria.

			Maximum Concentrations					
Contaminant	Half-Life (years)	Specific Activity (pCi/g)	Surface Soil	Units	Subsurface Soil	Units	Groundwater	Units
Uranium-234	2.46E+05	6.22E+09	3.79	pCi/g	8.25	pCi/g	10.28	pCi/L
Uranium-235	7.00E+08	2.17E+06	0.11	pCi/g	0.29	pCi/g	0.16	pCi/L
Uranium-238	4.50E+09	3.34E+05	4.05	pCi/g	8.02	pCi/g	7.49	pCi/L
Total Uranium[1]	--	--	12.19	mg/kg	24.18	mg/kg	22.52	µg/L
Total Uranium RSL[2]	--	--	3,450	mg/kg	1,725	mg/kg	30	µg/L

[1] The concentration for total uranium was derived as the sum of the ratios of individual uranium isotope concentrations and specific activities. Using the maximum concentrations resulted in U-234:U-238 activity ratios of 0.94, 1.03, and 1.37 for surface soil, subsurface soil, and groundwater, respectively. Using the arithmetic mean concentrations (see other tables) instead would result in activity ratios of 0.97, 1.01, and 1.28.

[2] U.S. Environmental Protection Agency regional screening level (RSL) based on hazard quotients of 0.5, and the Integrated Risk Information System oral reference dose. The RSL is based on industrial exposure for soils, and based on residential exposure for groundwater due to the unavailability of default industrial receptor parameters for exposure to groundwater.

Table 6-6. Exposure parameters used as input for RESRAD-ONSITE modeling.

RESRAD Parameter	Units	Value	Receptors	Comment/Reference
Area of contaminated zone	m^2	16,200	All	Site dimensions (180 meters x 90 meters)
Thickness of contaminated zone	m	0.15	All, except construction worker	Surface Soil
		1.37	All, except construction worker	Subsurface Soil
		1.52	Construction worker	Assumes one bulk source with a concentration weighted per thickness (surface and subsurface)
Length parallel to aquifer flow	m	100	All	RESRAD default
Time since placement of material	yr	0	All	RESRAD default
Cover depth	m	0	All	Assumes one bulk source for a construction worker and Surface Source for all other receptors
		0.15	All, except construction worker	Subsurface Soil: assumes 15 cm surface soil cover
Density of cover material	g/cm^3	NU	All	Assumes one bulk source for a construction worker and Surface Source for all other receptors
		1.7	All, except construction worker	Subsurface Soil: assumes silty clay per DCH, Table 2.1.1
Cover depth erosion rate	m/yr	NU	All	Assumes one bulk source for a construction worker and Surface Source for all other receptors
		0.00006	All, except construction worker	Subsurface source: DCH non-farming scenarios with 2% slope
Density of contaminated zone	g/cm^3	1.7	All	Assumed silty clay per DCH, Table 2.1.1
Contaminated zone erosion rate	m/yr	0.00006	All	Surface Soil: DCH non-farming scenarios with 2% slope
		NU	All	Subsurface Soil: Not used; surface soil is not completely eroded over 1,000 years simulation
Contaminated zone total porosity	unitless	0.42	All	Assumed consistent with brown clay layer than contains silty sand lenses; consistent with DCH Table 2.2.2 for clay
Contaminated zone field capacity	unitless	0.36	All	Assumed consistent natural water content (by fraction) of brown clay layer that contains silty sand lenses
Contaminated zone hydraulic conductivity	m/yr	68.4	All	Consistent with sandy clay per DCH, Table 2.4.2 (brown clay layer contains silty sand lenses)
Contaminated zone b parameter	unitless	10.4	All	Assumed for silty/sandy clay per DCH, Table 2.5.1 (brown clay layer has silty sand lenses)
Average annual wind speed	m/sec	4.4	All	NOAA: 2019 Niagara Falls International Airport
Humidity in air	g/m^3	NU	All	Not used
Evapotranspiration coefficient	unitless	0.5	All	RESRAD default
Precipitation	m/yr	0.9	All	NOAA: 2019 Niagara Falls International Airport
Irrigation	m/yr	0.2	All	RESRAD default
Irrigation mode	unitless	Overhead	All	RESRAD default
Runoff coefficient	unitless	0.4	All	For flat area - about 30% impervious (DCH, Table 3.2.1)
Watershed area for nearby stream or pond	m^2	1.00E+06	All *	RESRAD default
Accuracy for water/soil computations	unitless	0.001	All *	RESRAD default
Saturated zone density	g/cm^3	1.5	All *	RESRAD default
Saturated zone total porosity	unitless	0.4	All *	RESRAD default
Saturated zone effective porosity	unitless	0.2	All *	RESRAD default
Saturated zone field capacity	unitless	0.2	All *	RESRAD default
Saturated zone hydraulic conductivity	m/yr	100	All *	RESRAD default
Saturated zone hydraulic gradient	unitless	0.02	All *	RESRAD default
Saturated zone b parameter	unitless	5.3	All *	RESRAD default
Water table drop rate	m/yr	0.001	All *	RESRAD default
Well pump intake depth (m below water table)	m	10	All *	RESRAD default
Model: Nondispersion (ND) or Mass-Balance (MB)	unitless	ND	All *	RESRAD default
Well pumping rate	m^3/yr	250	All *	RESRAD default
Number of unsaturated zone strata	unitless	1	All *	RESRAD default
Unsaturated zone thickness	m	4	All *	RESRAD default
Unsaturated zone soil density	g/cm^3	1.57	All *	Assuming same as gray clay zone of 98.2 lbs/ft^3.
Unsaturated zone total porosity	unitless	0.42	All *	Assumed consistent with gray clay layer (DCH, Table 2.2.2)
Unsaturated zone effective porosity	unitless	0.06	All *	Assumed consistent with gray clay layer (DCH, Table 2.2.2)
Unsaturated zone field capacity	unitless	0.42	All *	Assumed consistent with gray clay layer (DCH, Table 2.16.1)
Unsaturated zone b parameter	unitless	11.4	All *	Assumed for gray clay layer (DCH, Table 2.5.1)
Unsaturated zone hydraulic conductivity	m/yr	40.5	All *	Consistent with clay per DCH Table 2.4.2 for gray clay layer
Distribution coefficient – actinium	cm^3/g	2,400	All *	Clay assumed for all soil strata (DCH, Table 2.13.3)
Distribution coefficient – protactinium	cm^3/g	2,700	All *	Clay assumed for all soil strata (DCH, Table 2.13.3)
Distribution coefficient – lead	cm^3/g	2,100	All	Generic soil assumed for all soil strata (DCH, Table 2.13.5)
Distribution coefficient – radium	cm^3/g	38,000	All	Clay assumed for all soil strata (DCH, Table 2.13.3)
Distribution coefficient – thorium	cm^3/g	4,500	All	Clay assumed for all soil strata (DCH, Table 2.13.3)
Distribution coefficient – uranium	cm^3/g	28	All *	Clay assumed for all soil strata (DCH, Table 2.13.3)
Inhalation rate	m^3/yr	10,204	Industrial Worker	Assuming male (age 51 to < 61) rate of 0.0194 m^3/min for light intensity activities (95th percentile) (EFH, Table 6-17)
		20,000	Construction Worker, Maintenance Worker, Recreational Adult	Assuming male (age 51 to < 61) rate of 0.0458 m^3/min for moderate intensity activities (95th percentile) (EFH, Table 6-17); however code limits inhalation to 20,000.
		19,408	Recreational Adolescent	Assuming male (age 11 to < 16) rate of 0.0369 m^3/min for moderate intensity activities (95th percentile) (EFH, Table 6-17)
Mass loading for inhalation	g/m^3	1.00E-04	Non-construction	RESRAD default
		6.00E-04	Construction	Assumed for construction activities (DCH)
Exposure duration	yr	25	Industrial & Maintenance Workers	Recommended duration for occupational receptors (USEPA 2014a).
		1	Construction Worker	Assuming construction activities during one calendar year.
		20	Recreational Adult	Recommended duration for (off-site) residential adult occupancy period (USEPA 2014a).
		6	Recreational Adolescent	Recommended duration for (off-site) residential child occupancy period (USEPA 2014a).
Shielding factor, inhalation	unitless	0.4	All	RESRAD default.
Shielding factor, external gamma	unitless	0.21	Industrial Worker	NUREG/CR-6697 Table 7.10-1; frame house with slab.
		NU	All others	RESRAD Default
Fraction of time spent indoors	unitless	0.2	Industrial Worker	Assumes 7 hr/day for 250 days/yr. (USACE 2002, Table 3-1)
		0	All others	No indoor exposure.
Fraction of time spent outdoors (on site)	unitless	0.029	Industrial Worker	Assumes 1 hr/day for 250 days/yr (USACE 2002, Table 3-1)
		0.023	Maintenance Worker	Assumes 4 hr/week for 50 weeks/yr (USACE 2002, Table 3-1)
		0.228	Construction Worker	Assumes 8 hr/day for 250 days/yr (USACE 2002, Table 3-1)
		0.012	Recreational Adult	Assumes 4 hr/week for 26 weeks/yr (USACE 2002, Table 3-1)
		0.012	Recreational Adolescent	Assumed 4 hr/week for 26 weeks/yr (USACE 2002, Table 3-1)
Shape factor flag, external gamma	unitless	1	All	RESRAD default
Fruits, vegetables and grains consumption	kg/yr	NU	All	Not used
Leafy vegetable consumption	kg/yr	NU	All	Not used
Milk consumption	kg/yr	NU	All	Not used
Meat and poultry consumption	kg/yr	101.6	Recreational Adolescent	95th percentile for an adolescent (11 to < 16 years) as per EFH Table 11-1.
		140.2	Recreational Adult	95th percentile for an adult as per EFH Table 11-1.
		NU	All others	Not used
Fish consumption	kg/yr	NU	All	Not used
Other seafood consumption	kg/yr	NU	All	Not used

Table 6-6. Exposure parameters used as input for RESRAD-ONSITE modeling.

RESRAD Parameter	Units	Value	Receptors	Comment/Reference
Soil ingestion rate	g/yr	20.5	Industrial Worker	50 mg/day (7 hours/day indoor) for RME industrial worker rate and 100 mg/day for 1 hour/day outdoor duration (RAGS and USEPA 2014a).
		36.5	Maintenance Worker	100 mg/day for RME outdoor worker rate (RAGS and USEPA 2014a)
		120.5	Construction Worker	330 mg/day for RME rate (USEPA 2002)
		36.5	Recreational Adult	100 mg/day for RME adult rate (RAGS and USEPA 2014a)
		36.5	Recreational Adolescent	100 mg/day assuming RME rate for adults (RAGS and USEPA 2014a)
Drinking water intake	L/yr	NU	All	Not used
Contamination fraction of drinking water	unitless	NU	All	Not used
Contamination fraction of household water	unitless	NU	All	Not used
Contamination fraction of livestock water	unitless	1	All**	RESRAD default, where applicable **
Contamination fraction of irrigation water	unitless	NU	All	Not used
Contamination fraction of aquatic food	unitless	NU	All	Not used
Contamination fraction of plant food	unitless	NU	All others	Not used
Contamination fraction of meat	unitless	0.223	Recreational Adolescent	Assumed as the ratio of 22.68 kg/yr of venison intake (1 buck harvested from site, yielding 50 lbs of venison; best professional judgement) to the total meat intake identified above.
		0.162	Recreational Adult	Assumed as the ratio of 22.68 kg/yr of venison intake (1 buck harvested from site, yielding 50 lbs of venison; best professional judgement) to the total meat intake identified above.
		NU	All others	Not used
Contamination fraction of milk	unitless	NU	All	Not used
Livestock fodder intake for meat	kg/day	68	All *	RESRAD default
Livestock fodder intake for milk	kg/day	55	All *	RESRAD default
Livestock water intake for meat	L/day	50	All *	RESRAD default
Livestock water intake for milk	L/day	160	All *	RESRAD default
Livestock soil intake	kg/day	0.5	All *	RESRAD default
Mass loading for foliar deposition	g/m^3	0.0001	All *	RESRAD default
Depth of soil mixing layer	m	0.15	All *	RESRAD default
Depth of roots	m	0.9	All *	RESRAD default
Drinking water fraction from ground water	unitless	NU	All	Not used
Household water fraction from ground water	unitless	NU	All	Not used
Livestock water fraction from ground water	unitless	0	Recreational Adult	Game assumed to ingest surface water only
		0	Recreational Adolescent	Game assumed to ingest surface water only
		NU	All others	Not used
Irrigation fraction from ground water	unitless	0	Recreational Adult	No irrigation for gaming scenario
		0	Recreational Adolescent	No irrigation for gaming scenario
		NU	All others	Not used
Wet weight crop yield for non-leafy	kg/m^2	0.7	All *	RESRAD default
Wet weight crop yield for leafy	kg/m^2	1.5	All *	RESRAD default
Wet weight crop yield for fodder	kg/m^2	1.1	All *	RESRAD default
Growing season for non-leafy	years	0.17	All *	RESRAD default
Growing season for leafy	years	0.25	All *	RESRAD default
Growing season for fodder	years	0.08	All *	RESRAD default
Translocation factor for non-leafy	unitless	0.1	All *	RESRAD default
Translocation factor for leafy	unitless	1	All *	RESRAD default
Translocation factor for fodder	unitless	1	All *	RESRAD default
Dry foliar interception fraction for non-leafy	unitless	0.25	All *	RESRAD default
Dry foliar interception fraction for leafy	unitless	0.25	All *	RESRAD default
Dry foliar interception fraction for fodder	unitless	0.25	All *	RESRAD default
Wet foliar interception fraction for non-leafy	unitless	0.25	All *	RESRAD default
Wet foliar interception fraction for leafy	unitless	0.25	All *	RESRAD default
Wet foliar interception fraction for fodder	unitless	0.25	All *	RESRAD default
Weathering removal constant for vegetation	unitless	20	All *	RESRAD default
Storage time: fruits, non-leafy vegetables, and grain	days	14	All *	RESRAD default
Storage time: leafy vegetables	days	1	All *	RESRAD default
Storage time: milk	days	NU	All	Not used
Storage time: meat and poultry	days	20	All *	RESRAD default
Storage time: fish	days	NU	All	Not used
Storage time: crustacea and mollusks	days	NU	All	Not used
Storage time: well water	days	NU	All	Not used
Storage time: surface water	days	1	All *	RESRAD default
Storage time: livestock fodder	days	NU	All	Not used
Thickness of building foundation	m	NU	All	Not used
Bulk density of building foundation	g/cm^3	NU	All	Not used
Total porosity of the cover material	unitless	NU	All	Not used
Total porosity of the building foundation	unitless	NU	All	Not used
Volumetric water constant of the cover material	unitless	NU	All	Not used
Volumetric water constant of the foundation	unitless	NU	All	Not used
Diffusion coef. for radon gas in cover material	m/sec	NU	All	Not used
Diffusion coef. for radon gas in foundation material	m/sec	NU	All	Not used
Diffusion coef. for radon gas in contaminated zone soil	m/sec	NU	All	Not used
Radon vertical dimension of mixing	m	NU	All	Not used
Average building air exchange rate	1/hour	NU	All	Not used
Height of the building (room)	m	NU	All	Not used
Building interior area factor	unitless	NU	All	Not used
Building depth below ground surface	m	NU	All	Not used
Emanating power of Rn-222 gas	unitless	NU	All	Not used
Emanating power of Rn-220 gas	unitless	NU	All	Not used
Pathway – external gamma	unitless	Active	All	Assumed complete for all receptors
Pathway – inhalation (w/o radon)	unitless	Active	All	Assumed complete for all receptors
Pathway – plant ingestion	unitless	Inactive	All	Assumed incomplete for all receptors
Pathway – meat ingestion	unitless	Active	Recreational Adult	Assumed complete for gaming receptors
		Active	Recreational Adolescent	Assumed complete for gaming receptors
		Inactive	All other	Assumed incomplete for all other receptors
Pathway – milk ingestion	unitless	Inactive	All	Assumed incomplete for all receptors
Pathway – aquatic foods	unitless	Inactive	All	Assumed incomplete for all receptors
Pathway – drinking water	unitless	Inactive	All	Assumed incomplete for all receptors
Pathway – soil ingestion	unitless	Active	All	Assumed complete for all receptors
Pathway – radon	unitless	Inactive	All	Inactive for all receptors

Notes, References, and Abbreviations

* Not used for some receptors when pathway is incomplete. Value can still be entered in RESRAD for all receptor whether eventually used or not.

** Game assumed to be the same as domestic livestock but consuming surface water and natural growth plants (for recreational scenarios)

DCH = Data Collection Handbook (Yu et al. 2015)

EFH = Exposure Factors Handbook (USEPA 2011a)

NOAA = National Oceanic and Atmospheric Administration; 2019 Niagara Falls International Airport Local Climatological Data

NU = not used

NUREG/CR-6697 = Development of Probabilistic RESRAD 6.0 and RESRAD-BUILD 3.0 Computer Codes (Yu et al. 2000)

RAGS = Risk Assessment Guidance for Superfund, Volume 1 Part B (USEPA 1991a)

RME = reasonable maximum exposure (see section 6.2.3.4)

USACE 2002 = White Paper: Using RESRAD in a CERCLA Radiological Risk Assessment

USEPA 2002 = Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, OSWER 9355.4-24.

USEPA 2014a = OSWER Directive 9200.1-120

Table 6-7. Exposure point concentrations (EPCs) for radionuclides of potential concern in site environmental media. Gross EPCs represent the average concentration in the site exposure unit to which a receptor is exposed, and were based on either the 95% upper confidence limit on the mean (UCL_{95}) (for soils) or the maximum concentration (for groundwater and surface water).

Surface Soil (0 to 0.5 ft bgs) Exposure Point Concentrations (pCi/g)

Radionuclide	Detections	Sample Size	Arithmetic Mean	Maximum	UCL_{95} on the mean	UCL_{95} Estimation Method	Gross EPC[1]	Background Mean
Radium-226	89	89	1.70	22.64	3.13	Chebyshev (μ, σ) [3]	3.13	0.74
Thorium-230	89	89	1.33	26.88	2.66	Chebyshev (μ, σ) [3]	2.66	0.93
Uranium-234	88	88	0.81	3.79	0.89	Modified-t	0.89	0.91
Uranium-235	25	88	0.03	0.11	0.04	Chebyshev (μ, σ) [3]	0.04	0.05
Uranium-238	88	88	0.83	4.05	0.92	Modified-t	0.92	0.86

Subsurface Soil (> 0.5 ft bgs) Exposure Point Concentrations (pCi/g)

Radionuclide	Detections	Sample Size	Arithmetic Mean	Maximum	UCL_{95} on the mean	UCL_{95} Estimation Method	Gross EPC[1]	Background Mean
Radium-226	178	178	2.83	155.20	7.33	Chebyshev (μ, σ) [3]	7.33	0.87
Thorium-230	175	177	2.34	228.70	7.96	Chebyshev (μ, σ) [3]	7.96	0.85
Uranium-234	178	178	1.13	8.25	1.24	Modified-t	1.24	0.68
Uranium-235	81	178	0.04	0.29	0.05	Chebyshev (μ, σ) [3]	0.05	0.04
Uranium-238	178	178	1.12	8.02	1.22	Modified-t	1.22	0.73

Groundwater Exposure Point Concentrations (pCi/L)

Radionuclide	Detections	Sample Size	Arithmetic Mean	Maximum	UCL_{95} on the mean	UCL_{95} Estimation Method	Gross EPC[2]	Background Mean
Uranium-234	3	3	5.71	10.28	13.79	Student's-t	10.28	2.55
Uranium-235	2	3	0.11	0.16	0.252	Student's-t	0.16	0.17
Uranium-238	3	3	4.48	7.49	10.26	Student's-t	7.49	1.64

[1] Gross EPCs for soil were the UCL_{95} estimate

[2] Gross EPCs for groundwater were set to the maximum concentration due to limited sample sizes.

[3] The Chebyshev inequality can be used to estimate a UCL either non-parametrically based on the sample mean (μ) and standard deviation (σ) or based on a minimum variance unbiased estimate (MVUE) of lognormal population parameters.

Table 6-8. Predicted effective dose rate and estimated incremental lifetime cancer risk (ILCR) for the potential construction worker receptor as a result of exposure to ROPCs in groundwater. The construction worker is the only receptor assumed to have non-negligble exposure to groundwater due to intrusive activities. Dose rate and ILCR were calculated using the equation and parameter values presented in section 6.2.5.1.

Industrial Worker Predicted Effective Annual Dose and Incremental Lifetime Cancer Risk - Gross Contribution

Medium	Radionuclide	Gross EPC (pCi L^{-1})	Dose Conversion Factor[1]	Predicted Effective Dose (mrem $year^{-1}$)	Cancer Risk Coefficient[2]	Estimated ILCR (unitless)
groundwater	U-234	10.28	1.81E-04	1.2E-03	7.07E-11	4.54E-10
groundwater	U-235+D	0.16	1.75E-04	1.8E-05	7.18E-11	7.22E-12
groundwater	U-238+D	7.49	1.79E-04	8.4E-04	8.71E-11	4.08E-10
Total	--	**--**	**--**	**2.02E-03**	--	**8.69E-10**

Industrial Worker Predicted Effective Annual Dose and Incremental Lifetime Cancer Risk - Background Contribution

Medium	Radionuclide	Mean Background (pCi L^{-1})	Dose Conversion Factor[1]	Predicted Effective Dose (mrem $year^{-1}$)	Cancer Risk Coefficient[2]	Estimated ILCR (unitless)
groundwater	U-234	2.55	1.81E-04	2.9E-04	7.07E-11	1.13E-10
groundwater	U-235+D	0.17	1.75E-04	1.9E-05	7.18E-11	7.63E-12
groundwater	U-238+D	1.64	1.79E-04	1.8E-04	8.71E-11	8.92E-11
Total	--	**--**	**--**	**4.90E-04**	--	**2.09E-10**

Industrial Worker Predicted Effective Annual Dose and Incremental Lifetime Cancer Risk - Net Contribution

Medium	Radionuclide	Net EPC[3] (pCi L^{-1})	Dose Conversion Factor[1]	Net Predicted Effective Dose[4] (mrem $year^{-1}$)	Cancer Risk Coefficient[2]	Net Estimated ILCR[4] (unitless)
groundwater	U-234	7.73	1.81E-04	8.7E-04	7.07E-11	3.42E-10
groundwater	U-235+D[5]	0.27	1.75E-04	3.0E-05	7.18E-11	1.21E-11
groundwater	U-238+D	5.85	1.79E-04	6.5E-04	8.71E-11	3.19E-10
Total	--	**--**	**--**	**1.56E-03**	--	**6.72E-10**

[1] Dose conversion factors were obtained from ICRP (1996) publication 72 for adult ingestion.

[2] Cancer risk coefficients were obtained from Federal Guidance Report No. 13 (Eckerman et al. 1999) for tapwater ingestion.

[3] Net EPC is to the UCL_{95} estimate of the mean radionuclide concentrations on the site minus the arithmetic mean background concentration.

[4] Net dose and risk estimates above background

[5] The calculated net EPC for U-235 was negative, so it was instead set based on assumed natural uranium isotope ratios.

Table 6-9. Estimated incremental lifetime cancer risk and predicted effective radiological dose rates due to potential industrial worker exposure to site soils. Risk and dose results are presented per unit activity for current (year 0) and modeled future (year 1,000) conditions and then scaled to represent the gross EPC contribution, mean backgroun contribution, and net site contribution. Total risk and dose estimates presented in boldface are summations across pathway-specific estimates for each radionuclide and the two soil horizons (surface and subsurface). The risk or dose attributable to each radionuclide is based on that radionuclide as the source term, but can include effects occurring due to exposure to its progeny. Fractions for each radionuclide represent the proportion of total risk or dose attributable to that radionuclide in a given soil horizon.

Industrial Worker - Unit Incremental Lifetime Cancer Risk - Year 0

Source	Radionuclide	Unit Concentration (pCi/g)	Pathway-Specific Risk Estimate			Total	Fraction
			External	Inhalation	Soil		
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	1.00	8.66E-07	1.70E-08	2.73E-08	9.10E-07	0.05
	Pa-231†	1.00	5.31E-07	1.93E-08	3.03E-08	5.80E-07	0.03
	Pb-210+D†	1.00	5.00E-09	4.73E-09	2.78E-07	2.87E-07	0.02
	Ra-226+D	1.00	1.29E-05	8.32E-09	1.81E-07	1.31E-05	0.74
	Th-230	1.00	7.11E-08	7.58E-09	1.46E-08	9.33E-08	0.01
	U-234	1.00	3.15E-10	4.41E-09	7.95E-09	1.27E-08	0.00
	U-235	1.00	6.52E-07	3.97E-09	8.13E-09	6.64E-07	0.04
	U-238	1.00	1.30E-07	3.75E-09	1.00E-08	1.44E-07	0.01
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	1.00	7.96E-08	1.27E-10	2.03E-10	7.99E-08	0.00
	Pa-231†	1.00	4.70E-08	1.68E-10	2.65E-10	4.75E-08	0.00
	Pb-210+D†	1.00	6.25E-11	2.08E-11	1.22E-09	1.31E-09	0.00
	Ra-226+D	1.00	1.82E-06	4.49E-11	1.09E-09	1.82E-06	0.10
	Th-230	1.00	9.89E-09	3.83E-11	7.54E-11	1.00E-08	0.00
	U-234	1.00	2.91E-12	2.95E-11	5.32E-11	8.56E-11	0.00
	U-235	1.00	2.53E-08	2.66E-11	5.44E-11	2.54E-08	0.00
	U-238	1.00	1.44E-08	2.51E-11	6.72E-11	1.45E-08	0.00
					Total:	**1.78E-05**	

† Assumed equilibrium

Industrial Worker - Unit Incremental Lifetime Cancer Risk - Year 1,000

Source	Radionuclide	Unit Concentration (pCi/g)	Pathway-Specific Risk Estimate			Total	Fraction
			External	Inhalation	Soil		
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	1.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
	Pa-231†	1.00	2.21E-19	4.37E-21	6.93E-21	2.33E-19	0.00
	Pb-210+D†	1.00	7.68E-23	4.49E-23	2.64E-21	2.76E-21	0.00
	Ra-226+D	1.00	6.68E-06	4.86E-09	1.70E-07	6.85E-06	0.48
	Th-230	1.00	3.15E-06	5.49E-09	8.39E-08	3.24E-06	0.23
	U-234	1.00	9.59E-10	1.71E-12	2.56E-11	9.87E-10	0.00
	U-235	1.00	1.74E-19	7.63E-22	1.52E-21	1.76E-19	0.00
	U-238	1.00	9.20E-14	1.67E-16	2.46E-15	9.46E-14	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	1.00	1.48E-24	7.04E-26	1.13E-25	1.66E-24	0.00
	Pa-231†	1.00	1.56E-08	9.44E-10	1.50E-09	1.80E-08	0.00
	Pb-210+D†	1.00	7.11E-24	5.68E-23	3.34E-21	3.40E-21	0.00
	Ra-226+D	1.00	2.63E-06	3.46E-09	1.22E-07	2.75E-06	0.19
	Th-230	1.00	1.42E-06	4.77E-09	6.90E-08	1.49E-06	0.10
	U-234	1.00	2.95E-09	1.14E-10	3.30E-10	3.40E-09	0.00
	U-235	1.00	4.71E-09	1.12E-10	2.20E-10	5.04E-09	0.00
	U-238	1.00	1.54E-09	8.73E-11	2.34E-10	1.86E-09	0.00
					Total:	**1.44E-05**	

† Assumed equilibrium

Industrial Worker - Unit Total Effective Radiological Dose Rate (mrem/yr) - Year 0							
		Unit	Pathway-Specific Dose Prediction				
Source	Radionuclide	Concentration (pCi/g)	External	Inhalation	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	1.00	1.17E-01	1.79E-02	1.99E-02	1.55E-01	0.15
	Pa-231†	1.00	1.34E-02	4.86E-03	1.25E-02	3.07E-02	0.03
	Pb-210+D†	1.00	5.08E-04	3.26E-04	3.23E-02	3.32E-02	0.03
	Ra-226+D	1.00	6.48E-01	3.21E-04	5.37E-03	6.54E-01	0.63
	Th-230	1.00	2.14E-04	3.31E-03	3.65E-03	7.17E-03	0.01
	U-234	1.00	2.34E-05	3.07E-04	8.39E-04	1.17E-03	0.00
	U-235	1.00	4.61E-02	2.78E-04	8.11E-04	4.71E-02	0.05
	U-238	1.00	9.88E-03	2.61E-04	8.29E-04	1.10E-02	0.01
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	1.00	6.19E-03	3.67E-06	4.09E-06	6.20E-03	0.01
	Pa-231†	1.00	6.71E-04	1.00E-06	2.55E-06	6.75E-04	0.00
	Pb-210+D†	1.00	6.73E-06	6.48E-08	6.44E-06	1.32E-05	0.00
	Ra-226+D	1.00	9.02E-02	6.45E-08	1.11E-06	9.02E-02	0.09
	Th-230	1.00	2.01E-05	6.62E-07	7.30E-07	2.15E-05	0.00
	U-234	1.00	1.21E-07	6.21E-08	1.70E-07	3.53E-07	0.00
	U-235	1.00	1.32E-03	5.62E-08	1.64E-07	1.32E-03	0.00
	U-238	1.00	8.10E-04	5.29E-08	1.68E-07	8.10E-04	0.00
† Assumed equilibrium					**Total:**	**1.04E+00**	

Industrial Worker - Unit Total Effective Radiological Dose Rate (mrem/yr) - Year 1,000							
		Unit	Pathway-Specific Dose Prediction				
Source	Radionuclide	Concentration (pCi/g)	External	Inhalation	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	1.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
	Pa-231†	1.00	1.56E-14	2.07E-15	3.47E-15	2.12E-14	0.00
	Pb-210+D†	1.00	7.79E-18	3.10E-18	3.08E-16	3.19E-16	0.00
	Ra-226+D	1.00	3.37E-01	2.41E-04	1.40E-02	3.51E-01	0.48
	Th-230	1.00	1.57E-01	1.54E-03	7.91E-03	1.66E-01	0.23
	U-234	1.00	4.78E-05	4.83E-07	2.42E-06	5.07E-05	0.00
	U-235	1.00	1.23E-14	9.08E-17	2.11E-16	1.26E-14	0.00
	U-238	1.00	4.58E-09	4.78E-11	2.34E-10	4.86E-09	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	1.00	1.15E-19	4.26E-20	4.75E-20	2.05E-19	0.00
	Pa-231†	1.00	8.12E-04	3.48E-04	5.07E-04	1.67E-03	0.00
	Pb-210+D†	1.00	7.74E-19	3.83E-18	3.80E-16	3.85E-16	0.00
	Ra-226+D	1.00	1.31E-01	1.68E-04	9.85E-03	1.41E-01	0.19
	Th-230	1.00	6.93E-02	1.36E-03	6.45E-03	7.71E-02	0.10
	U-234	1.00	1.44E-04	8.92E-06	2.86E-05	1.82E-04	0.00
	U-235	1.00	2.45E-04	1.20E-05	2.45E-05	2.82E-04	0.00
	U-238	1.00	8.66E-05	4.50E-06	1.43E-05	1.05E-04	0.00
† Assumed equilibrium					**Total:**	**7.37E-01**	

Industrial Worker Gross Incremental Lifetime Cancer Risk - Year 0							
		Gross EPC	Pathway-Specific Risk Estimate				
Source	Radionuclide	(pCi/g)	External	Inhalation	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.04	3.49E-08	6.83E-10	1.10E-09	3.67E-08	0.00
	Pa-231†	0.04	2.14E-08	7.76E-10	1.22E-09	2.34E-08	0.00
	Pb-210+D†	3.13	1.56E-08	1.48E-08	8.69E-07	9.00E-07	0.02
	Ra-226+D	3.13	4.03E-05	2.61E-08	5.67E-07	4.09E-05	0.73
	Th-230	2.66	1.89E-07	2.01E-08	3.88E-08	2.48E-07	0.00
	U-234	0.89	2.79E-10	3.92E-09	7.06E-09	1.13E-08	0.00
	U-235	0.04	2.63E-08	1.60E-10	3.28E-10	2.68E-08	0.00
	U-238	0.92	1.19E-07	3.43E-09	9.19E-09	1.32E-07	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.05	4.10E-09	6.51E-12	1.05E-11	4.11E-09	0.00
	Pa-231†	0.05	2.42E-09	8.63E-12	1.37E-11	2.44E-09	0.00
	Pb-210+D†	7.33	4.58E-10	1.53E-10	8.96E-09	9.58E-09	0.00
	Ra-226+D	7.33	1.33E-05	3.29E-10	8.00E-09	1.33E-05	0.24
	Th-230	7.96	7.87E-08	3.05E-10	6.00E-10	7.96E-08	0.00
	U-234	1.24	3.60E-12	3.65E-11	6.58E-11	1.06E-10	0.00
	U-235	0.05	1.30E-09	1.37E-12	2.80E-12	1.31E-09	0.00
	U-238	1.22	1.75E-08	3.06E-11	8.18E-11	1.76E-08	0.00
† Assumed equilibrium					**Total:**	**5.57E-05**	

Industrial Worker Gross Incremental Lifetime Cancer Risk - Year 1,000							
		Gross EPC	Pathway-Specific Risk Estimate				
Source	Radionuclide	(pCi/g)	External	Inhalation	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
	Pa-231†	0.04	8.92E-21	1.76E-22	2.79E-22	9.37E-21	0.00
	Pb-210+D†	3.13	2.41E-22	1.41E-22	8.26E-21	8.64E-21	0.00
	Ra-226+D	3.13	2.09E-05	1.52E-08	5.34E-07	2.14E-05	0.35
	Th-230	2.66	8.35E-06	1.46E-08	2.23E-07	8.59E-06	0.14
	U-234	0.89	8.52E-10	1.51E-12	2.28E-11	8.76E-10	0.00
	U-235	0.04	7.00E-21	3.07E-23	6.12E-23	7.09E-21	0.00
	U-238	0.92	8.42E-14	1.53E-16	2.25E-15	8.66E-14	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.05	7.61E-26	3.62E-27	5.83E-27	8.56E-26	0.00
	Pa-231†	0.05	8.02E-10	4.86E-11	7.74E-11	9.28E-10	0.00
	Pb-210+D†	7.33	5.21E-23	4.16E-22	2.44E-20	2.49E-20	0.00
	Ra-226+D	7.33	1.92E-05	2.53E-08	8.94E-07	2.02E-05	0.32
	Th-230	7.96	1.13E-05	3.80E-08	5.49E-07	1.18E-05	0.19
	U-234	1.24	3.65E-09	1.41E-10	4.08E-10	4.20E-09	0.00
	U-235	0.05	2.43E-10	5.77E-12	1.14E-11	2.60E-10	0.00
	U-238	1.22	1.87E-09	1.06E-10	2.84E-10	2.26E-09	0.00
† Assumed equilibrium					**Total:**	**6.21E-05**	

Industrial Worker Gross Total Effective Radiological Dose Rate (mrem/yr) - Year 0							
		Gross EPC	Pathway-Specific Dose Prediction				
Source	Radionuclide	(pCi/g)	External	Inhalation	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.04	4.73E-03	7.21E-04	8.04E-04	6.26E-03	0.00
	Pa-231†	0.04	5.40E-04	1.96E-04	5.03E-04	1.24E-03	0.00
	Pb-210+D†	3.13	1.59E-03	1.02E-03	1.01E-01	1.04E-01	0.04
	Ra-226+D	3.13	2.03E+00	1.00E-03	1.68E-02	2.05E+00	0.72
	Th-230	2.66	5.68E-04	8.79E-03	9.68E-03	1.90E-02	0.01
	U-234	0.89	2.08E-05	2.72E-04	7.45E-04	1.04E-03	0.00
	U-235	0.04	1.86E-03	1.12E-05	3.27E-05	1.90E-03	0.00
	U-238	0.92	9.04E-03	2.39E-04	7.58E-04	1.00E-02	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.05	3.19E-04	1.89E-07	2.11E-07	3.19E-04	0.00
	Pa-231†	0.05	3.46E-05	5.17E-08	1.31E-07	3.47E-05	0.00
	Pb-210+D†	7.33	4.94E-05	4.75E-07	4.72E-05	9.70E-05	0.00
	Ra-226+D	7.33	6.61E-01	4.72E-07	8.12E-06	6.61E-01	0.23
	Th-230	7.96	1.60E-04	5.27E-06	5.81E-06	1.71E-04	0.00
	U-234	1.24	1.49E-07	7.69E-08	2.10E-07	4.36E-07	0.00
	U-235	0.05	6.78E-05	2.89E-09	8.45E-09	6.78E-05	0.00
	U-238	1.22	9.86E-04	6.45E-08	2.04E-07	9.87E-04	0.00
† Assumed equilibrium					**Total:**	**2.85E+00**	

Industrial Worker Gross Total Effective Radiological Dose Rate (mrem/yr) - Year 1,000							
		Gross EPC	Pathway-Specific Dose Prediction				
Source	Radionuclide	(pCi/g)	External	Inhalation	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
	Pa-231†	0.04	6.30E-16	8.33E-17	1.40E-16	8.53E-16	0.00
	Pb-210+D†	3.13	2.44E-17	9.72E-18	9.64E-16	9.98E-16	0.00
	Ra-226+D	3.13	1.05E+00	7.55E-04	4.39E-02	1.10E+00	0.35
	Th-230	2.66	4.16E-01	4.08E-03	2.10E-02	4.41E-01	0.14
	U-234	0.89	4.24E-05	4.29E-07	2.15E-06	4.50E-05	0.00
	U-235	0.04	4.95E-16	3.66E-18	8.50E-18	5.07E-16	0.00
	U-238	0.92	4.19E-09	4.37E-11	2.14E-10	4.45E-09	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.05	5.92E-21	2.19E-21	2.44E-21	1.06E-20	0.00
	Pa-231†	0.05	4.18E-05	1.79E-05	2.61E-05	8.58E-05	0.00
	Pb-210+D†	7.33	5.67E-18	2.81E-17	2.79E-15	2.82E-15	0.00
	Ra-226+D	7.33	9.57E-01	1.23E-03	7.22E-02	1.03E+00	0.32
	Th-230	7.96	5.52E-01	1.08E-02	5.13E-02	6.14E-01	0.19
	U-234	1.24	1.78E-04	1.10E-05	3.53E-05	2.25E-04	0.00
	U-235	0.05	1.26E-05	6.20E-07	1.26E-06	1.45E-05	0.00
	U-238	1.22	1.05E-04	5.48E-06	1.74E-05	1.28E-04	0.00
† Assumed equilibrium					**Total:**	**3.19E+00**	

Industrial Worker Background Incremental Lifetime Cancer Risk - Year 0							
			Pathway-Specific Risk Estimate				
Source	Radionuclide	Mean Background (pCi/g)	External	Inhalation	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.05	4.03E-08	7.89E-10	1.27E-09	4.23E-08	0.00
	Pa-231†	0.05	2.47E-08	8.95E-10	1.41E-09	2.70E-08	0.00
	Pb-210+D†	0.74	3.72E-09	3.52E-09	2.07E-07	2.14E-07	0.02
	Ra-226+D	0.74	9.59E-06	6.20E-09	1.35E-07	9.73E-06	0.82
	Th-230	0.93	6.59E-08	7.03E-09	1.36E-08	8.65E-08	0.01
	U-234	0.91	2.87E-10	4.03E-09	7.25E-09	1.16E-08	0.00
	U-235	0.05	3.03E-08	1.85E-10	3.78E-10	3.09E-08	0.00
	U-238	0.86	1.12E-07	3.23E-09	8.64E-09	1.24E-07	0.01
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.04	2.90E-09	4.61E-12	7.41E-12	2.91E-09	0.00
	Pa-231†	0.04	1.71E-09	6.11E-12	9.67E-12	1.73E-09	0.00
	Pb-210+D†	0.87	5.42E-11	1.81E-11	1.06E-09	1.13E-09	0.00
	Ra-226+D	0.87	1.57E-06	3.89E-11	9.47E-10	1.58E-06	0.13
	Th-230	0.85	8.40E-09	3.25E-11	6.40E-11	8.49E-09	0.00
	U-234	0.68	1.99E-12	2.02E-11	3.63E-11	5.85E-11	0.00
	U-235	0.04	9.22E-10	9.69E-13	1.98E-12	9.25E-10	0.00
	U-238	0.73	1.05E-08	1.84E-11	4.92E-11	1.06E-08	0.00
† Assumed equilibrium					**Total:**	**1.19E-05**	

Industrial Worker Background Incremental Lifetime Cancer Risk - Year 1,000							
			Pathway-Specific Risk Estimate				
Source	Radionuclide	Mean Background (pCi/g)	External	Inhalation	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
	Pa-231†	0.05	1.03E-20	2.03E-22	3.22E-22	1.08E-20	0.00
	Pb-210+D†	0.74	5.72E-23	3.34E-23	1.96E-21	2.05E-21	0.00
	Ra-226+D	0.74	4.97E-06	3.62E-09	1.27E-07	5.10E-06	0.43
	Th-230	0.93	2.92E-06	5.09E-09	7.78E-08	3.00E-06	0.26
	U-234	0.91	8.76E-10	1.56E-12	2.34E-11	9.00E-10	0.00
	U-235	0.05	8.07E-21	3.55E-23	7.06E-23	8.18E-21	0.00
	U-238	0.86	7.92E-14	1.44E-16	2.12E-15	8.14E-14	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.04	5.39E-26	2.56E-27	4.12E-27	6.05E-26	0.00
	Pa-231†	0.04	5.67E-10	3.44E-11	5.48E-11	6.56E-10	0.00
	Pb-210+D†	0.87	6.17E-24	4.93E-23	2.89E-21	2.95E-21	0.00
	Ra-226+D	0.87	2.28E-06	3.00E-09	1.06E-07	2.39E-06	0.20
	Th-230	0.85	1.20E-06	4.05E-09	5.86E-08	1.26E-06	0.11
	U-234	0.68	2.02E-09	7.79E-11	2.25E-10	2.32E-09	0.00
	U-235	0.04	1.72E-10	4.08E-12	8.03E-12	1.84E-10	0.00
	U-238	0.73	1.13E-09	6.40E-11	1.71E-10	1.36E-09	0.00
† Assumed equilibrium					**Total:**	**1.18E-05**	

Industrial Worker Background Total Effective Radiological Dose Rate (mrem/yr) - Year 0							
		Mean Background	Pathway-Specific Dose Prediction				
Source	Radionuclide	(pCi/g)	External	Inhalation	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.05	5.46E-03	8.32E-04	9.27E-04	7.22E-03	0.01
	Pa-231†	0.05	6.23E-04	2.26E-04	5.80E-04	1.43E-03	0.00
	Pb-210+D†	0.74	3.78E-04	2.42E-04	2.41E-02	2.47E-02	0.04
	Ra-226+D	0.74	4.83E-01	2.39E-04	4.00E-03	4.87E-01	0.79
	Th-230	0.93	1.98E-04	3.07E-03	3.38E-03	6.65E-03	0.01
	U-234	0.91	2.14E-05	2.80E-04	7.65E-04	1.07E-03	0.00
	U-235	0.05	2.14E-03	1.29E-05	3.77E-05	2.19E-03	0.00
	U-238	0.86	8.50E-03	2.25E-04	7.13E-04	9.44E-03	0.02
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.04	2.26E-04	1.34E-07	1.49E-07	2.26E-04	0.00
	Pa-231†	0.04	2.45E-05	3.66E-08	9.29E-08	2.46E-05	0.00
	Pb-210+D†	0.87	5.84E-06	5.62E-08	5.58E-06	1.15E-05	0.00
	Ra-226+D	0.87	7.83E-02	5.59E-08	9.61E-07	7.83E-02	0.13
	Th-230	0.85	1.71E-05	5.62E-07	6.20E-07	1.83E-05	0.00
	U-234	0.68	8.25E-08	4.24E-08	1.16E-07	2.41E-07	0.00
	U-235	0.04	4.80E-05	2.05E-09	5.98E-09	4.80E-05	0.00
	U-238	0.73	5.93E-04	3.88E-08	1.23E-07	5.93E-04	0.00
† Assumed equilibrium					**Total:**	**6.19E-01**	

Industrial Worker Background Total Effective Radiological Dose Rate (mrem/yr) - Year 1,000							
		Mean Background	Pathway-Specific Dose Prediction				
Source	Radionuclide	(pCi/g)	External	Inhalation	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
	Pa-231†	0.05	7.27E-16	9.61E-17	1.61E-16	9.84E-16	0.00
	Pb-210+D†	0.74	5.80E-18	2.31E-18	2.29E-16	2.37E-16	0.00
	Ra-226+D	0.74	2.51E-01	1.79E-04	1.04E-02	2.61E-01	0.43
	Th-230	0.93	1.45E-01	1.42E-03	7.33E-03	1.54E-01	0.26
	U-234	0.91	4.36E-05	4.41E-07	2.21E-06	4.63E-05	0.00
	U-235	0.05	5.71E-16	4.22E-18	9.81E-18	5.85E-16	0.00
	U-238	0.86	3.94E-09	4.11E-11	2.01E-10	4.18E-09	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.04	4.19E-21	1.55E-21	1.73E-21	7.47E-21	0.00
	Pa-231†	0.04	2.96E-05	1.27E-05	1.85E-05	6.07E-05	0.00
	Pb-210+D†	0.87	6.71E-19	3.32E-18	3.30E-16	3.34E-16	0.00
	Ra-226+D	0.87	1.13E-01	1.46E-04	8.54E-03	1.22E-01	0.20
	Th-230	0.85	5.89E-02	1.15E-03	5.47E-03	6.55E-02	0.11
	U-234	0.68	9.84E-05	6.09E-06	1.95E-05	1.24E-04	0.00
	U-235	0.04	8.93E-06	4.39E-07	8.94E-07	1.03E-05	0.00
	U-238	0.73	6.34E-05	3.29E-06	1.04E-05	7.71E-05	0.00
† Assumed equilibrium					**Total:**	**6.03E-01**	

Industrial Worker Net Incremental Lifetime Cancer Risk - Year 0							
		Net EPC	Pathway-Specific Risk Estimate				
Source	Radionuclide	(pCi/g)	External	Inhalation	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.00	2.21E-09	4.33E-11	6.96E-11	2.32E-09	0.00
	Pa-231†	0.00	1.35E-09	4.91E-11	7.73E-11	1.48E-09	0.00
	Pb-210+D†	2.39	1.19E-08	1.13E-08	6.63E-07	6.86E-07	0.02
	Ra-226+D	2.39	3.07E-05	1.99E-08	4.32E-07	3.12E-05	0.71
	Th-230	1.73	1.23E-07	1.31E-08	2.53E-08	1.61E-07	0.00
	U-234†	0.05	1.72E-11	2.41E-10	4.35E-10	6.94E-10	0.00
	U-235‡	0.00	1.66E-09	1.01E-11	2.07E-11	1.69E-09	0.00
	U-238	0.05	7.12E-09	2.05E-10	5.50E-10	7.88E-09	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.02	1.20E-09	1.91E-12	3.06E-12	1.20E-09	0.00
	Pa-231†	0.02	7.08E-10	2.52E-12	4.00E-12	7.15E-10	0.00
	Pb-210+D†	6.46	4.04E-10	1.35E-10	7.90E-09	8.44E-09	0.00
	Ra-226+D	6.46	1.17E-05	2.90E-10	7.06E-09	1.17E-05	0.27
	Th-230	7.11	7.03E-08	2.72E-10	5.36E-10	7.11E-08	0.00
	U-234	0.55	1.61E-12	1.64E-11	2.95E-11	4.74E-11	0.00
	U-235	0.02	3.81E-10	4.00E-13	8.20E-13	3.82E-10	0.00
	U-238	0.49	6.97E-09	1.22E-11	3.26E-11	7.02E-09	0.00
					Total:	**4.39E-05**	

† Assumed equilibrium

‡ Assumed natural uranium ratio

Industrial Worker Net Incremental Lifetime Cancer Risk - Year 1,000							
		Net EPC	Pathway-Specific Risk Estimate				
Source	Radionuclide	(pCi/g)	External	Inhalation	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
	Pa-231†	0.00	5.64E-22	1.11E-23	1.77E-23	5.93E-22	0.00
	Pb-210+D†	2.39	1.83E-22	1.07E-22	6.29E-21	6.58E-21	0.00
	Ra-226+D	2.39	1.59E-05	1.16E-08	4.07E-07	1.63E-05	0.32
	Th-230	1.73	5.44E-06	9.48E-09	1.45E-07	5.59E-06	0.11
	U-234†	0.05	5.25E-11	9.33E-14	1.40E-12	5.40E-11	0.00
	U-235‡	0.00	4.43E-22	1.95E-24	3.87E-24	4.49E-22	0.00
	U-238	0.05	5.04E-15	9.13E-18	1.35E-16	5.18E-15	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.02	2.23E-26	1.06E-27	1.71E-27	2.50E-26	0.00
	Pa-231†	0.02	2.35E-10	1.42E-11	2.26E-11	2.71E-10	0.00
	Pb-210+D†	6.46	4.60E-23	3.67E-22	2.16E-20	2.20E-20	0.00
	Ra-226+D	6.46	1.70E-05	2.23E-08	7.88E-07	1.78E-05	0.35
	Th-230	7.11	1.01E-05	3.39E-08	4.90E-07	1.06E-05	0.21
	U-234	0.55	1.64E-09	6.31E-11	1.83E-10	1.88E-09	0.00
	U-235	0.02	7.10E-11	1.69E-12	3.32E-12	7.60E-11	0.00
	U-238	0.49	7.46E-10	4.24E-11	1.13E-10	9.01E-10	0.00
					Total:	**5.03E-05**	

† Assumed equilibrium

‡ Assumed natural uranium ratio

Industrial Worker Net Total Effective Radiological Dose Rate (mrem/yr) - Year 0							
		Net EPC	Pathway-Specific Dose Prediction				
Source	Radionuclide	(pCi/g)	External	Inhalation	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.00	2.99E-04	4.56E-05	5.09E-05	3.96E-04	0.00
	Pa-231†	0.00	3.42E-05	1.24E-05	3.18E-05	7.84E-05	0.00
	Pb-210+D†	2.39	1.21E-03	7.77E-04	7.72E-02	7.91E-02	0.04
	Ra-226+D	2.39	1.55E+00	7.65E-04	1.28E-02	1.56E+00	0.70
	Th-230	1.73	3.70E-04	5.72E-03	6.30E-03	1.24E-02	0.01
	U-234†	0.05	1.28E-06	1.68E-05	4.59E-05	6.40E-05	0.00
	U-235‡	0.00	1.17E-04	7.08E-07	2.07E-06	1.20E-04	0.00
	U-238	0.05	5.41E-04	1.43E-05	4.53E-05	6.00E-04	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.02	9.33E-05	5.52E-08	6.16E-08	9.34E-05	0.00
	Pa-231†	0.02	1.01E-05	1.51E-08	3.84E-08	1.02E-05	0.00
	Pb-210+D†	6.46	4.35E-05	4.19E-07	4.16E-05	8.55E-05	0.00
	Ra-226+D	6.46	5.83E-01	4.17E-07	7.16E-06	5.83E-01	0.26
	Th-230	7.11	1.43E-04	4.71E-06	5.19E-06	1.53E-04	0.00
	U-234	0.55	6.69E-08	3.44E-08	9.41E-08	1.95E-07	0.00
	U-235	0.02	1.98E-05	8.46E-10	2.47E-09	1.98E-05	0.00
	U-238	0.49	3.93E-04	2.57E-08	8.15E-08	3.93E-04	0.00
					Total:	**2.24E+00**	

† Assumed equilibrium

‡ Assumed natural uranium ratio

Industrial Worker Net Total Effective Radiological Dose Rate (mrem/yr) - Year 1,000							
		Net EPC	Pathway-Specific Dose Prediction				
Source	Radionuclide	(pCi/g)	External	Inhalation	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
	Pa-231†	0.00	3.99E-17	5.27E-18	8.86E-18	5.40E-17	0.00
	Pb-210+D†	2.39	1.86E-17	7.41E-18	7.35E-16	7.61E-16	0.00
	Ra-226+D	2.39	8.04E-01	5.75E-04	3.35E-02	8.38E-01	0.32
	Th-230	1.73	2.71E-01	2.65E-03	1.37E-02	2.87E-01	0.11
	U-234†	0.05	2.62E-06	2.64E-08	1.33E-07	2.77E-06	0.00
	U-235‡	0.00	3.13E-17	2.31E-19	5.38E-19	3.21E-17	0.00
	U-238	0.05	2.51E-10	2.62E-12	1.28E-11	2.66E-10	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.02	1.73E-21	6.41E-22	7.15E-22	3.09E-21	0.00
	Pa-231†	0.02	1.22E-05	5.24E-06	7.63E-06	2.51E-05	0.00
	Pb-210+D†	6.46	5.00E-18	2.48E-17	2.46E-15	2.49E-15	0.00
	Ra-226+D	6.46	8.44E-01	1.09E-03	6.36E-02	9.09E-01	0.35
	Th-230	7.11	4.93E-01	9.63E-03	4.58E-02	5.48E-01	0.21
	U-234	0.55	7.98E-05	4.94E-06	1.58E-05	1.01E-04	0.00
	U-235	0.02	3.69E-06	1.81E-07	3.70E-07	4.24E-06	0.00
	U-238	0.49	4.20E-05	2.18E-06	6.92E-06	5.11E-05	0.00
					Total:	**2.58E+00**	

† Assumed equilibrium

‡ Assumed natural uranium ratio

Table 6-10. Estimated incremental lifetime cancer risk and predicted effective radiological dose rates due to potential maintenance worker exposure to site soils. Risk and dose results are presented per unit activity for current (year 0) and modeled future (year 1,000) conditions and then scaled to represent the gross EPC contribution, mean backgroun contribution, and net site contribution. Total risk and dose estimates presented in boldface are summations across pathway-specific estimates for each radionuclide and the two soil horizons (surface and subsurface). The risk or dose attributable to each radionuclide is based on that radionuclide as the source term, but can include effects occurring due to exposure to its progeny. Fractions for each radionuclide represent the proportion of total risk or dose attributable to that radionuclide in a given soil horizon.

Maintenance Worker - Unit Incremental Lifetime Cancer Risk - Year 0							
		Unit	Pathway-Specific Risk Estimate				
Source	Radionuclide	Concentration (pCi/g)	External	Inhalation	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	1.00	2.81E-07	7.01E-09	4.88E-09	2.92E-07	0.05
	Pa-231†	1.00	1.72E-07	7.96E-09	5.42E-09	1.85E-07	0.03
	Pb-210+D†	1.00	1.62E-09	1.96E-09	4.97E-08	5.32E-08	0.01
	Ra-226+D	1.00	4.17E-06	3.44E-09	3.24E-08	4.21E-06	0.74
	Th-230	1.00	2.30E-08	3.14E-09	2.62E-09	2.88E-08	0.01
	U-234	1.00	1.02E-10	1.82E-09	1.42E-09	3.35E-09	0.00
	U-235	1.00	2.11E-07	1.64E-09	1.45E-09	2.14E-07	0.04
	U-238	1.00	3.33E-08	1.23E-09	1.42E-09	3.60E-08	0.01
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	1.00	2.80E-08	5.90E-11	4.10E-11	2.81E-08	0.00
	Pa-231†	1.00	1.64E-08	7.47E-11	5.11E-11	1.65E-08	0.00
	Pb-210+D†	1.00	2.03E-11	8.62E-12	2.19E-10	2.48E-10	0.00
	Ra-226+D	1.00	5.88E-07	1.86E-11	1.95E-10	5.88E-07	0.10
	Th-230	1.00	3.20E-09	1.58E-11	1.35E-11	3.23E-09	0.00
	U-234	1.00	9.18E-13	1.17E-11	9.13E-12	2.18E-11	0.00
	U-235	1.00	7.96E-09	1.06E-11	9.35E-12	7.97E-09	0.00
	U-238	1.00	4.51E-09	9.96E-12	1.15E-11	4.53E-09	0.00
† Assumed equilibrium					**Total:**	**5.67E-06**	

Maintenance Worker - Unit Incremental Lifetime Cancer Risk - Year 1,000							
		Unit	Pathway-Specific Risk Estimate				
Source	Radionuclide	Concentration (pCi/g)	External	Inhalation	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	1.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
	Pa-231†	1.00	7.17E-20	1.81E-21	1.24E-21	7.47E-20	0.00
	Pb-210+D†	1.00	2.49E-23	1.86E-23	4.72E-22	5.15E-22	0.00
	Ra-226+D	1.00	2.16E-06	2.01E-09	3.05E-08	2.19E-06	0.46
	Th-230	1.00	1.02E-06	2.27E-09	1.50E-08	1.04E-06	0.22
	U-234	1.00	3.11E-10	7.05E-13	4.58E-12	3.16E-10	0.00
	U-235	1.00	5.62E-20	3.16E-22	2.72E-22	5.68E-20	0.00
	U-238	1.00	1.69E-14	3.88E-17	2.50E-16	1.72E-14	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	1.00	1.26E-21	7.67E-23	5.34E-23	1.39E-21	0.00
	Pa-231†	1.00	1.33E-07	1.00E-08	6.89E-09	1.49E-07	0.03
	Pb-210+D†	1.00	2.30E-24	2.35E-23	5.96E-22	6.22E-22	0.00
	Ra-226+D	1.00	8.51E-07	1.43E-09	2.18E-08	8.74E-07	0.18
	Th-230	1.00	4.58E-07	1.97E-09	1.23E-08	4.73E-07	0.10
	U-234	1.00	6.25E-10	6.45E-12	1.97E-11	6.51E-10	0.00
	U-235	1.00	6.20E-10	4.11E-11	2.89E-11	6.90E-10	0.00
	U-238	1.00	4.12E-11	2.97E-12	3.44E-12	4.76E-11	0.00
† Assumed equilibrium					**Total:**	**4.73E-06**	

Maintenance Worker - Unit Total Effective Radiological Dose Rate (mrem/yr) - Year 0							
		Unit Concentration	Pathway-Specific Dose Prediction				
Source	Radionuclide	(pCi/g)	External	Inhalation	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	1.00	3.80E-02	7.40E-03	3.57E-03	4.90E-02	0.15
	Pa-231†	1.00	4.34E-03	2.01E-03	2.23E-03	8.58E-03	0.03
	Pb-210+D†	1.00	1.65E-04	1.35E-04	5.78E-03	6.08E-03	0.02
	Ra-226+D	1.00	2.10E-01	1.33E-04	9.60E-04	2.11E-01	0.64
	Th-230	1.00	6.93E-05	1.37E-03	6.52E-04	2.09E-03	0.01
	U-234	1.00	7.59E-06	1.27E-04	1.50E-04	2.84E-04	0.00
	U-235	1.00	1.49E-02	1.15E-04	1.45E-04	1.52E-02	0.05
	U-238	1.00	3.17E-03	1.07E-04	1.47E-04	3.42E-03	0.01
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	1.00	2.01E-03	1.53E-06	7.35E-07	2.02E-03	0.01
	Pa-231†	1.00	2.18E-04	4.16E-07	4.57E-07	2.19E-04	0.00
	Pb-210+D†	1.00	2.18E-06	2.68E-08	1.15E-06	3.36E-06	0.00
	Ra-226+D	1.00	2.92E-02	2.67E-08	1.98E-07	2.92E-02	0.09
	Th-230	1.00	6.52E-06	2.74E-07	1.31E-07	6.92E-06	0.00
	U-234	1.00	3.91E-08	2.57E-08	3.03E-08	9.51E-08	0.00
	U-235	1.00	4.26E-04	2.32E-08	2.93E-08	4.26E-04	0.00
	U-238	1.00	2.62E-04	2.19E-08	3.00E-08	2.62E-04	0.00
† Assumed equilibrium					**Total:**	**3.28E-01**	

Maintenance Worker - Unit Total Effective Radiological Dose Rate (mrem/yr) - Year 1,000							
		Unit Concentration	Pathway-Specific Dose Prediction				
Source	Radionuclide	(pCi/g)	External	Inhalation	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	1.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
	Pa-231†	1.00	5.06E-15	8.55E-16	6.21E-16	6.54E-15	0.00
	Pb-210+D†	1.00	2.52E-18	1.28E-18	5.51E-17	5.89E-17	0.00
	Ra-226+D	1.00	1.09E-01	9.97E-05	2.51E-03	1.12E-01	0.46
	Th-230	1.00	5.08E-02	6.35E-04	1.41E-03	5.28E-02	0.22
	U-234	1.00	1.55E-05	2.00E-07	4.33E-07	1.61E-05	0.00
	U-235	1.00	3.98E-15	3.75E-17	3.77E-17	4.05E-15	0.00
	U-238	1.00	8.42E-10	1.11E-11	2.37E-11	8.77E-10	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	1.00	9.07E-17	4.29E-17	2.07E-17	1.54E-16	0.00
	Pa-231†	1.00	6.66E-03	3.59E-03	2.20E-03	1.25E-02	0.05
	Pb-210+D†	1.00	2.51E-19	1.59E-18	6.80E-17	6.98E-17	0.00
	Ra-226+D	1.00	4.23E-02	6.95E-05	1.76E-03	4.41E-02	0.18
	Th-230	1.00	2.25E-02	5.61E-04	1.15E-03	2.42E-02	0.10
	U-234	1.00	3.05E-05	1.07E-06	1.84E-06	3.34E-05	0.00
	U-235	1.00	3.15E-05	1.38E-05	8.57E-06	5.39E-05	0.00
	U-238	1.00	2.39E-06	1.58E-07	2.16E-07	2.76E-06	0.00
† Assumed equilibrium					**Total:**	**2.45E-01**	

Maintenance Worker Gross Incremental Lifetime Cancer Risk - Year 0							
		Gross EPC	Pathway-Specific Risk Estimate				
Source	Radionuclide	(pCi/g)	External	Inhalation	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.04	1.13E-08	2.83E-10	1.97E-10	1.18E-08	0.00
	Pa-231†	0.04	6.93E-09	3.21E-10	2.19E-10	7.47E-09	0.00
	Pb-210+D†	3.13	5.07E-09	6.12E-09	1.55E-07	1.67E-07	0.01
	Ra-226+D	3.13	1.31E-05	1.08E-08	1.01E-07	1.32E-05	0.74
	Th-230	2.66	6.11E-08	8.32E-09	6.94E-09	7.64E-08	0.00
	U-234	0.89	9.05E-11	1.62E-09	1.26E-09	2.97E-09	0.00
	U-235	0.04	8.51E-09	6.62E-11	5.86E-11	8.64E-09	0.00
	U-238	0.92	3.05E-08	1.12E-09	1.30E-09	3.29E-08	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.05	1.44E-09	3.04E-12	2.11E-12	1.45E-09	0.00
	Pa-231†	0.05	8.44E-10	3.84E-12	2.63E-12	8.51E-10	0.00
	Pb-210+D†	7.33	1.48E-10	6.32E-11	1.60E-09	1.81E-09	0.00
	Ra-226+D	7.33	4.31E-06	1.36E-10	1.43E-09	4.31E-06	0.24
	Th-230	7.96	2.55E-08	1.26E-10	1.07E-10	2.57E-08	0.00
	U-234	1.24	1.14E-12	1.45E-11	1.13E-11	2.69E-11	0.00
	U-235	0.05	4.10E-10	5.44E-13	4.81E-13	4.11E-10	0.00
	U-238	1.22	5.50E-09	1.21E-11	1.40E-11	5.52E-09	0.00
† Assumed equilibrium					**Total:**	**1.78E-05**	

Maintenance Worker Gross Incremental Lifetime Cancer Risk - Year 1,000							
		Gross EPC	Pathway-Specific Risk Estimate				
Source	Radionuclide	(pCi/g)	External	Inhalation	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
	Pa-231†	0.04	2.89E-21	7.29E-23	4.99E-23	3.01E-21	0.00
	Pb-210+D†	3.13	7.79E-23	5.82E-23	1.48E-21	1.61E-21	0.00
	Ra-226+D	3.13	6.77E-06	6.29E-09	9.54E-08	6.87E-06	0.35
	Th-230	2.66	2.71E-06	6.02E-09	3.98E-08	2.75E-06	0.14
	U-234	0.89	2.76E-10	6.26E-13	4.07E-12	2.81E-10	0.00
	U-235	0.04	2.27E-21	1.27E-23	1.09E-23	2.29E-21	0.00
	U-238	0.92	1.55E-14	3.55E-17	2.28E-16	1.57E-14	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.05	6.50E-23	3.95E-24	2.75E-24	7.17E-23	0.00
	Pa-231†	0.05	6.83E-09	5.15E-10	3.55E-10	7.70E-09	0.00
	Pb-210+D†	7.33	1.69E-23	1.72E-22	4.37E-21	4.56E-21	0.00
	Ra-226+D	7.33	6.24E-06	1.05E-08	1.60E-07	6.41E-06	0.32
	Th-230	7.96	3.65E-06	1.57E-08	9.81E-08	3.76E-06	0.19
	U-234	1.24	7.73E-10	7.98E-12	2.43E-11	8.05E-10	0.00
	U-235	0.05	3.19E-11	2.12E-12	1.49E-12	3.55E-11	0.00
	U-238	1.22	5.01E-11	3.62E-12	4.19E-12	5.79E-11	0.00
† Assumed equilibrium					**Total:**	**1.98E-05**	

Maintenance Worker Gross Total Effective Radiological Dose Rate (mrem/yr) - Year 0							
		Gross EPC	Pathway-Specific Dose Prediction				
Source	Radionuclide	(pCi/g)	External	Inhalation	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.04	1.53E-03	2.98E-04	1.44E-04	1.97E-03	0.00
	Pa-231†	0.04	1.75E-04	8.10E-05	8.99E-05	3.46E-04	0.00
	Pb-210+D†	3.13	5.15E-04	4.22E-04	1.81E-02	1.90E-02	0.02
	Ra-226+D	3.13	6.58E-01	4.15E-04	3.01E-03	6.61E-01	0.73
	Th-230	2.66	1.84E-04	3.63E-03	1.73E-03	5.55E-03	0.01
	U-234	0.89	6.74E-06	1.13E-04	1.33E-04	2.53E-04	0.00
	U-235	0.04	6.01E-04	4.63E-06	5.84E-06	6.12E-04	0.00
	U-238	0.92	2.90E-03	9.78E-05	1.34E-04	3.13E-03	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.05	1.04E-04	7.85E-08	3.79E-08	1.04E-04	0.00
	Pa-231†	0.05	1.12E-05	2.14E-08	2.35E-08	1.13E-05	0.00
	Pb-210+D†	7.33	1.60E-05	1.97E-07	8.44E-06	2.46E-05	0.00
	Ra-226+D	7.33	2.14E-01	1.95E-07	1.45E-06	2.14E-01	0.24
	Th-230	7.96	5.18E-05	2.18E-06	1.04E-06	5.51E-05	0.00
	U-234	1.24	4.84E-08	3.17E-08	3.75E-08	1.18E-07	0.00
	U-235	0.05	2.19E-05	1.20E-09	1.51E-09	2.19E-05	0.00
	U-238	1.22	3.19E-04	2.66E-08	3.65E-08	3.19E-04	0.00
† Assumed equilibrium					**Total:**	**9.07E-01**	

Maintenance Worker Gross Total Effective Radiological Dose Rate (mrem/yr) - Year 1,000							
		Gross EPC	Pathway-Specific Dose Prediction				
Source	Radionuclide	(pCi/g)	External	Inhalation	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
	Pa-231†	0.04	2.04E-16	3.44E-17	2.50E-17	2.64E-16	0.00
	Pb-210+D†	3.13	7.90E-18	4.02E-18	1.72E-16	1.84E-16	0.00
	Ra-226+D	3.13	3.42E-01	3.12E-04	7.86E-03	3.50E-01	0.35
	Th-230	2.66	1.35E-01	1.69E-03	3.75E-03	1.40E-01	0.14
	U-234	0.89	1.37E-05	1.77E-07	3.85E-07	1.43E-05	0.00
	U-235	0.04	1.60E-16	1.51E-18	1.52E-18	1.63E-16	0.00
	U-238	0.92	7.71E-10	1.01E-11	2.17E-11	8.03E-10	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.05	4.67E-18	2.21E-18	1.06E-18	7.94E-18	0.00
	Pa-231†	0.05	3.43E-04	1.85E-04	1.13E-04	6.41E-04	0.00
	Pb-210+D†	7.33	1.84E-18	1.16E-17	4.99E-16	5.12E-16	0.00
	Ra-226+D	7.33	3.10E-01	5.10E-04	1.29E-02	3.23E-01	0.32
	Th-230	7.96	1.79E-01	4.46E-03	9.17E-03	1.92E-01	0.19
	U-234	1.24	3.78E-05	1.33E-06	2.27E-06	4.14E-05	0.00
	U-235	0.05	1.62E-06	7.10E-07	4.41E-07	2.77E-06	0.00
	U-238	1.22	2.90E-06	1.92E-07	2.64E-07	3.36E-06	0.00
† Assumed equilibrium					**Total:**	**1.01E+00**	

Maintenance Worker Background Incremental Lifetime Cancer Risk - Year 0							
			Pathway-Specific Risk Estimate				
Source	Radionuclide	Mean Background (pCi/g)	External	Inhalation	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.05	1.30E-08	3.26E-10	2.27E-10	1.36E-08	0.00
	Pa-231†	0.05	7.99E-09	3.70E-10	2.52E-10	8.62E-09	0.00
	Pb-210+D†	0.74	1.20E-09	1.46E-09	3.70E-08	3.96E-08	0.01
	Ra-226+D	0.74	3.11E-06	2.56E-09	2.41E-08	3.13E-06	0.83
	Th-230	0.93	2.13E-08	2.91E-09	2.42E-09	2.67E-08	0.01
	U-234	0.91	9.30E-11	1.66E-09	1.30E-09	3.05E-09	0.00
	U-235	0.05	9.82E-09	7.64E-11	6.76E-11	9.96E-09	0.00
	U-238	0.86	2.87E-08	1.05E-09	1.22E-09	3.09E-08	0.01
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.04	1.02E-09	2.15E-12	1.49E-12	1.02E-09	0.00
	Pa-231†	0.04	5.97E-10	2.72E-12	1.86E-12	6.02E-10	0.00
	Pb-210+D†	0.87	1.76E-11	7.47E-12	1.90E-10	2.15E-10	0.00
	Ra-226+D	0.87	5.10E-07	1.61E-11	1.69E-10	5.10E-07	0.13
	Th-230	0.85	2.72E-09	1.34E-11	1.15E-11	2.75E-09	0.00
	U-234	0.68	6.27E-13	8.01E-12	6.24E-12	1.49E-11	0.00
	U-235	0.04	2.90E-10	3.85E-13	3.41E-13	2.91E-10	0.00
	U-238	0.73	3.31E-09	7.30E-12	8.45E-12	3.32E-09	0.00
† Assumed equilibrium					**Total:**	**3.78E-06**	

Maintenance Worker Background Incremental Lifetime Cancer Risk - Year 1,000							
			Pathway-Specific Risk Estimate				
Source	Radionuclide	Mean Background (pCi/g)	External	Inhalation	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
	Pa-231†	0.05	3.33E-21	8.41E-23	5.76E-23	3.48E-21	0.00
	Pb-210+D†	0.74	1.85E-23	1.38E-23	3.51E-22	3.83E-22	0.00
	Ra-226+D	0.74	1.61E-06	1.50E-09	2.27E-08	1.63E-06	0.43
	Th-230	0.93	9.45E-07	2.10E-09	1.39E-08	9.61E-07	0.26
	U-234	0.91	2.84E-10	6.44E-13	4.18E-12	2.88E-10	0.00
	U-235	0.05	2.61E-21	1.47E-23	1.26E-23	2.64E-21	0.00
	U-238	0.86	1.46E-14	3.34E-17	2.15E-16	1.48E-14	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.04	4.60E-23	2.80E-24	1.94E-24	5.07E-23	0.00
	Pa-231†	0.04	4.83E-09	3.64E-10	2.51E-10	5.45E-09	0.00
	Pb-210+D†	0.87	2.00E-24	2.04E-23	5.17E-22	5.39E-22	0.00
	Ra-226+D	0.87	7.38E-07	1.24E-09	1.89E-08	7.58E-07	0.20
	Th-230	0.85	3.89E-07	1.68E-09	1.05E-08	4.01E-07	0.11
	U-234	0.68	4.27E-10	4.41E-12	1.34E-11	4.44E-10	0.00
	U-235	0.04	2.26E-11	1.50E-12	1.05E-12	2.51E-11	0.00
	U-238	0.73	3.01E-11	2.18E-12	2.52E-12	3.48E-11	0.00
† Assumed equilibrium					**Total:**	**3.76E-06**	

Maintenance Worker Background Total Effective Radiological Dose Rate (mrem/yr) - Year 0							
		Mean Background	Pathway-Specific Dose Prediction				
Source	Radionuclide	(pCi/g)	External	Inhalation	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.05	1.77E-03	3.44E-04	1.66E-04	2.28E-03	0.01
	Pa-231†	0.05	2.02E-04	9.34E-05	1.04E-04	3.99E-04	0.00
	Pb-210+D†	0.74	1.22E-04	1.00E-04	4.30E-03	4.53E-03	0.02
	Ra-226+D	0.74	1.56E-01	9.87E-05	7.15E-04	1.57E-01	0.80
	Th-230	0.93	6.43E-05	1.27E-03	6.05E-04	1.94E-03	0.01
	U-234	0.91	6.93E-06	1.16E-04	1.37E-04	2.60E-04	0.00
	U-235	0.05	6.94E-04	5.34E-06	6.74E-06	7.06E-04	0.00
	U-238	0.86	2.72E-03	9.20E-05	1.26E-04	2.94E-03	0.02
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.04	7.34E-05	5.56E-08	2.68E-08	7.35E-05	0.00
	Pa-231†	0.04	7.94E-06	1.52E-08	1.66E-08	7.97E-06	0.00
	Pb-210+D†	0.87	1.89E-06	2.33E-08	9.98E-07	2.91E-06	0.00
	Ra-226+D	0.87	2.53E-02	2.31E-08	1.72E-07	2.53E-02	0.13
	Th-230	0.85	5.53E-06	2.33E-07	1.11E-07	5.88E-06	0.00
	U-234	0.68	2.67E-08	1.75E-08	2.07E-08	6.50E-08	0.00
	U-235	0.04	1.55E-05	8.46E-10	1.07E-09	1.55E-05	0.00
	U-238	0.73	1.92E-04	1.60E-08	2.19E-08	1.92E-04	0.00
					Total:	**1.96E-01**	

† Assumed equilibrium

Maintenance Worker Background Total Effective Radiological Dose Rate (mrem/yr) - Year 1,000							
		Mean Background	Pathway-Specific Dose Prediction				
Source	Radionuclide	(pCi/g)	External	Inhalation	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
	Pa-231†	0.05	2.35E-16	3.97E-17	2.89E-17	3.04E-16	0.00
	Pb-210+D†	0.74	1.88E-18	9.55E-19	4.10E-17	4.38E-17	0.00
	Ra-226+D	0.74	8.12E-02	7.42E-05	1.87E-03	8.32E-02	0.43
	Th-230	0.93	4.71E-02	5.89E-04	1.31E-03	4.90E-02	0.26
	U-234	0.91	1.41E-05	1.82E-07	3.96E-07	1.47E-05	0.00
	U-235	0.05	1.85E-16	1.75E-18	1.75E-18	1.88E-16	0.00
	U-238	0.86	7.25E-10	9.51E-12	2.04E-11	7.55E-10	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.04	3.31E-18	1.56E-18	7.53E-19	5.62E-18	0.00
	Pa-231†	0.04	2.43E-04	1.31E-04	8.02E-05	4.54E-04	0.00
	Pb-210+D†	0.87	2.17E-19	1.37E-18	5.90E-17	6.06E-17	0.00
	Ra-226+D	0.87	3.67E-02	6.03E-05	1.53E-03	3.83E-02	0.20
	Th-230	0.85	1.91E-02	4.76E-04	9.79E-04	2.05E-02	0.11
	U-234	0.68	2.09E-05	7.34E-07	1.26E-06	2.28E-05	0.00
	U-235	0.04	1.15E-06	5.02E-07	3.12E-07	1.96E-06	0.00
	U-238	0.73	1.75E-06	1.16E-07	1.59E-07	2.02E-06	0.00
					Total:	**1.91E-01**	

† Assumed equilibrium

Maintenance Worker Net Incremental Lifetime Cancer Risk - Year 0							
		Net EPC	Pathway-Specific Risk Estimate				
Source	Radionuclide	(pCi/g)	External	Inhalation	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.00	7.16E-10	1.79E-11	1.24E-11	7.46E-10	0.00
	Pa-231†	0.00	4.38E-10	2.03E-11	1.38E-11	4.73E-10	0.00
	Pb-210+D†	2.39	3.86E-09	4.67E-09	1.18E-07	1.27E-07	0.01
	Ra-226+D	2.39	9.96E-06	8.21E-09	7.73E-08	1.00E-05	0.71
	Th-230	1.73	3.98E-08	5.42E-09	4.52E-09	4.97E-08	0.00
	U-234†	0.05	5.58E-12	9.98E-11	7.78E-11	1.83E-10	0.00
	U-235‡	0.00	5.39E-10	4.19E-12	3.71E-12	5.47E-10	0.00
	U-238	0.05	1.82E-09	6.71E-11	7.77E-11	1.97E-09	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.02	4.22E-10	8.88E-13	6.18E-13	4.23E-10	0.00
	Pa-231†	0.02	2.47E-10	1.12E-12	7.70E-13	2.49E-10	0.00
	Pb-210+D†	6.46	1.31E-10	5.57E-11	1.41E-09	1.60E-09	0.00
	Ra-226+D	6.46	3.80E-06	1.20E-10	1.26E-09	3.80E-06	0.27
	Th-230	7.11	2.28E-08	1.13E-10	9.59E-11	2.30E-08	0.00
	U-234	0.55	5.09E-13	6.49E-12	5.06E-12	1.21E-11	0.00
	U-235	0.02	1.20E-10	1.59E-13	1.41E-13	1.20E-10	0.00
	U-238	0.49	2.19E-09	4.84E-12	5.60E-12	2.20E-09	0.00
					Total:	**1.41E-05**	

† Assumed equilibrium

‡ Assumed natural uranium ratio

Maintenance Worker Net Incremental Lifetime Cancer Risk - Year 1,000							
		Net EPC	Pathway-Specific Risk Estimate				
Source	Radionuclide	(pCi/g)	External	Inhalation	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
	Pa-231†	0.00	1.83E-22	4.61E-24	3.16E-24	1.91E-22	0.00
	Pb-210+D†	2.39	5.94E-23	4.43E-23	1.13E-21	1.23E-21	0.00
	Ra-226+D	2.39	5.16E-06	4.80E-09	7.27E-08	5.24E-06	0.33
	Th-230	1.73	1.76E-06	3.92E-09	2.59E-08	1.79E-06	0.11
	U-234†	0.05	1.70E-11	3.86E-14	2.51E-13	1.73E-11	0.00
	U-235‡	0.00	1.43E-22	8.05E-25	6.93E-25	1.45E-22	0.00
	U-238	0.05	9.26E-16	2.13E-18	1.37E-17	9.42E-16	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.02	1.90E-23	1.16E-24	8.04E-25	2.10E-23	0.00
	Pa-231†	0.02	2.00E-09	1.51E-10	1.04E-10	2.25E-09	0.00
	Pb-210+D†	6.46	1.49E-23	1.52E-22	3.85E-21	4.02E-21	0.00
	Ra-226+D	6.46	5.50E-06	9.24E-09	1.41E-07	5.65E-06	0.35
	Th-230	7.11	3.26E-06	1.40E-08	8.76E-08	3.36E-06	0.21
	U-234	0.55	3.46E-10	3.57E-12	1.09E-11	3.60E-10	0.00
	U-235	0.02	9.34E-12	6.19E-13	4.36E-13	1.04E-11	0.00
	U-238	0.49	2.00E-11	1.44E-12	1.67E-12	2.31E-11	0.00
					Total:	**1.60E-05**	

† Assumed equilibrium

‡ Assumed natural uranium ratio

Maintenance Worker Net Total Effective Radiological Dose Rate (mrem/yr) - Year 0							
		Net EPC	Pathway-Specific Dose Prediction				
Source	Radionuclide	(pCi/g)	External	Inhalation	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.00	9.70E-05	1.89E-05	9.10E-06	1.25E-04	0.00
	Pa-231†	0.00	1.11E-05	5.12E-06	5.69E-06	2.19E-05	0.00
	Pb-210+D†	2.39	3.93E-04	3.21E-04	1.38E-02	1.45E-02	0.02
	Ra-226+D	2.39	5.01E-01	3.16E-04	2.29E-03	5.04E-01	0.71
	Th-230	1.73	1.20E-04	2.37E-03	1.13E-03	3.61E-03	0.01
	U-234†	0.05	4.16E-07	6.95E-06	8.21E-06	1.56E-05	0.00
	U-235‡	0.00	3.81E-05	2.93E-07	3.70E-07	3.87E-05	0.00
	U-238	0.05	1.73E-04	5.85E-06	8.02E-06	1.87E-04	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.02	3.03E-05	2.30E-08	1.11E-08	3.04E-05	0.00
	Pa-231†	0.02	3.28E-06	6.27E-09	6.88E-09	3.29E-06	0.00
	Pb-210+D†	6.46	1.41E-05	1.73E-07	7.44E-06	2.17E-05	0.00
	Ra-226+D	6.46	1.89E-01	1.72E-07	1.28E-06	1.89E-01	0.27
	Th-230	7.11	4.63E-05	1.95E-06	9.28E-07	4.92E-05	0.00
	U-234	0.55	2.17E-08	1.42E-08	1.68E-08	5.27E-08	0.00
	U-235	0.02	6.42E-06	3.50E-10	4.41E-10	6.42E-06	0.00
	U-238	0.49	1.27E-04	1.06E-08	1.45E-08	1.27E-04	0.00
					Total:	**7.11E-01**	

† Assumed equilibrium

‡ Assumed natural uranium ratio

Maintenance Worker Net Total Effective Radiological Dose Rate (mrem/yr) - Year 1,000							
		Net EPC	Pathway-Specific Dose Prediction				
Source	Radionuclide	(pCi/g)	External	Inhalation	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
	Pa-231†	0.00	1.29E-17	2.18E-18	1.58E-18	1.67E-17	0.00
	Pb-210+D†	2.39	6.02E-18	3.06E-18	1.31E-16	1.41E-16	0.00
	Ra-226+D	2.39	2.60E-01	2.38E-04	5.99E-03	2.67E-01	0.33
	Th-230	1.73	8.77E-02	1.10E-03	2.44E-03	9.13E-02	0.11
	U-234†	0.05	8.47E-07	1.09E-08	2.37E-08	8.82E-07	0.00
	U-235‡	0.00	1.01E-17	9.57E-20	9.62E-20	1.03E-17	0.00
	U-238	0.05	4.61E-11	6.05E-13	1.30E-12	4.80E-11	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.02	1.37E-18	6.46E-19	3.11E-19	2.32E-18	0.00
	Pa-231†	0.02	1.00E-04	5.40E-05	3.32E-05	1.88E-04	0.00
	Pb-210+D†	6.46	1.62E-18	1.02E-17	4.40E-16	4.51E-16	0.00
	Ra-226+D	6.46	2.73E-01	4.49E-04	1.14E-02	2.85E-01	0.35
	Th-230	7.11	1.60E-01	3.98E-03	8.20E-03	1.72E-01	0.21
	U-234	0.55	1.69E-05	5.95E-07	1.02E-06	1.85E-05	0.00
	U-235	0.02	4.75E-07	2.08E-07	1.29E-07	8.12E-07	0.00
	U-238	0.49	1.16E-06	7.67E-08	1.05E-07	1.34E-06	0.00
					Total:	**8.15E-01**	

† Assumed equilibrium

‡ Assumed natural uranium ratio

Table 6-11. Estimated incremental lifetime cancer risk and predicted effective radiological dose rates due to potential construction worker exposure to site soils. Risk and dose results are presented per unit activity for current (year 0) and modeled future (year 1,000) conditions and then scaled to represent the gross EPC contribution, mean backgroun contribution, and net site contribution. Total risk and dose estimates presented in boldface are summations across pathway-specific estimates for each radionuclide and the two soil horizons (surface and subsurface). The risk or dose attributable to each radionuclide is based on that radionuclide as the source term, but can include effects occurring due to exposure to its progeny. Fractions for each radionuclide represent the proportion of total risk or dose attributable to that radionuclide in a given soil horizon.

Construction Worker - Unit Incremental Lifetime Cancer Risk - Year 0							
			Pathway-Specific Risk Estimate				
Source	Radionuclide	Unit Concentration (pCi/g)	External	Inhalation	Soil	Total	Fraction
Total Soil (0 to 1.52 m bgs) (0 to 5 ft bgs)	Ac-227†	1.00	3.14E-07	4.62E-08	1.77E-08	3.78E-07	0.15
	Pa-231†	1.00	3.52E-08	1.76E-08	6.51E-09	5.93E-08	0.02
	Pb-210+D†	1.00	9.12E-10	6.70E-09	9.35E-08	1.01E-07	0.04
	Ra-226+D	1.00	1.84E-06	6.36E-09	1.57E-08	1.86E-06	0.72
	Th-230	1.00	5.79E-10	7.52E-09	3.29E-09	1.14E-08	0.00
	U-234	1.00	5.58E-11	6.14E-09	2.63E-09	8.83E-09	0.00
	U-235	1.00	1.19E-07	5.52E-09	2.69E-09	1.27E-07	0.05
	U-238	1.00	2.46E-08	5.22E-09	3.32E-09	3.32E-08	0.01
† Assumed equilibrium					**Total:**	**2.58E-06**	

Construction Worker - Unit Incremental Lifetime Cancer Risk - Year 1,000							
			Pathway-Specific Risk Estimate				
Source	Radionuclide	Unit Concentration (pCi/g)	External	Inhalation	Soil	Total	Fraction
Total Soil (0 to 1.52 m bgs) (0 to 5 ft bgs)	Ac-227†	1.00	4.00E-24	5.89E-25	2.25E-25	4.81E-24	0.00
	Pa-231†	1.00	1.78E-08	3.32E-09	1.26E-09	2.24E-08	0.01
	Pb-210+D†	1.00	2.70E-23	1.98E-22	2.77E-21	2.99E-21	0.00
	Ra-226+D	1.00	1.19E-06	8.48E-09	7.13E-08	1.27E-06	0.64
	Th-230	1.00	6.32E-07	1.16E-08	3.98E-08	6.83E-07	0.34
	U-234	1.00	1.41E-09	3.88E-10	2.43E-10	2.04E-09	0.00
	U-235	1.00	7.28E-09	3.91E-10	1.83E-10	7.85E-09	0.00
	U-238	1.00	1.43E-09	3.05E-10	1.94E-10	1.93E-09	0.00
† Assumed equilibrium					**Total:**	**1.98E-06**	

Construction Worker - Unit Total Effective Radiological Dose Rate (mrem/yr) - Year 0							
		Unit Concentration	Pathway-Specific Dose Prediction				
Source	Radionuclide	(pCi/g)	External	Inhalation	Soil	Total	Fraction
Total Soil (0 to 1.52 m bgs) (0 to 5 ft bgs)	Ac-227†	1.00	4.00E-01	4.56E-01	1.21E-01	9.77E-01	0.24
	Pa-231†	1.00	4.47E-02	1.22E-01	7.43E-02	2.41E-01	0.06
	Pb-210+D†	1.00	1.62E-03	8.05E-03	1.90E-01	2.00E-01	0.05
	Ra-226+D	1.00	2.30E+00	7.92E-03	3.16E-02	2.33E+00	0.57
	Th-230	1.00	7.33E-04	8.18E-02	2.15E-02	1.04E-01	0.03
	U-234	1.00	7.61E-05	7.68E-03	5.00E-03	1.28E-02	0.00
	U-235	1.00	1.51E-01	6.95E-03	4.83E-03	1.63E-01	0.04
	U-238	1.00	3.37E-02	6.54E-03	4.94E-03	4.52E-02	0.01
† Assumed equilibrium					**Total:**	**4.08E+00**	

Construction Worker - Unit Total Effective Radiological Dose Rate (mrem/yr) - Year 1,000							
		Unit Concentration	Pathway-Specific Dose Prediction				
Source	Radionuclide	(pCi/g)	External	Inhalation	Soil	Total	Fraction
Total Soil (0 to 1.52 m bgs) (0 to 5 ft bgs)	Ac-227†	1.00	5.10E-18	5.82E-18	1.54E-18	1.25E-17	0.00
	Pa-231†	1.00	2.27E-02	2.99E-02	1.03E-02	6.29E-02	0.02
	Pb-210+D†	1.00	4.81E-17	2.38E-16	5.63E-15	5.92E-15	0.00
	Ra-226+D	1.00	1.48E+00	1.04E-02	1.45E-01	1.64E+00	0.61
	Th-230	1.00	7.90E-01	8.40E-02	9.49E-02	9.68E-01	0.36
	U-234	1.00	1.76E-03	6.94E-04	5.15E-04	2.97E-03	0.00
	U-235	1.00	9.28E-03	1.03E-03	4.98E-04	1.08E-02	0.00
	U-238	1.00	1.96E-03	3.82E-04	2.88E-04	2.63E-03	0.00
† Assumed equilibrium					**Total:**	**2.69E+00**	

Construction Worker Gross Incremental Lifetime Cancer Risk - Year 0							
			Pathway-Specific Risk Estimate				
Source	Radionuclide	Weighted Gross EPC‡ (pCi/g)	External	Inhalation	Soil	Total	Fraction
Total Soil (0 to 1.52 m bgs) (0 to 5 ft bgs)	Ac-227†	0.05	1.58E-08	2.33E-09	8.90E-10	1.90E-08	0.00
	Pa-231†	0.05	1.78E-09	8.85E-10	3.28E-10	2.99E-09	0.00
	Pb-210+D†	6.91	6.30E-09	4.63E-08	6.46E-07	6.99E-07	0.05
	Ra-226+D	6.91	1.27E-05	4.39E-08	1.08E-07	1.28E-05	0.94
	Th-230	7.43	4.30E-09	5.59E-08	2.44E-08	8.46E-08	0.01
	U-234	1.20	6.71E-11	7.38E-09	3.16E-09	1.06E-08	0.00
	U-235	0.05	5.98E-09	2.78E-10	1.36E-10	6.39E-09	0.00
	U-238	1.19	2.92E-08	6.20E-09	3.95E-09	3.94E-08	0.00
					Total:	**1.37E-05**	

† Assumed equilibrium

‡ Calcuated over 1.52 m (5ft) as the sum of 10% of the 0.15m (0.5ft) surface soil EPC and 90% of the 1.37 m (4.5ft) subsurface soil EPC

Construction Worker Gross Incremental Lifetime Cancer Risk - Year 1,000							
			Pathway-Specific Risk Estimate				
Source	Radionuclide	Weighted Gross EPC‡ (pCi/g)	External	Inhalation	Soil	Total	Fraction
Total Soil (0 to 1.52 m bgs) (0 to 5 ft bgs)	Ac-227†	0.05	2.02E-25	2.97E-26	1.14E-26	2.43E-25	0.00
	Pa-231†	0.05	8.97E-10	1.67E-10	6.35E-11	1.13E-09	0.00
	Pb-210+D†	6.91	1.87E-22	1.37E-21	1.91E-20	2.07E-20	0.00
	Ra-226+D	6.91	8.20E-06	5.86E-08	4.92E-07	8.75E-06	0.63
	Th-230	7.43	4.69E-06	8.64E-08	2.95E-07	5.07E-06	0.37
	U-234	1.20	1.69E-09	4.66E-10	2.92E-10	2.45E-09	0.00
	U-235	0.05	3.67E-10	1.97E-11	9.22E-12	3.96E-10	0.00
	U-238	1.19	1.70E-09	3.62E-10	2.30E-10	2.29E-09	0.00
					Total:	**1.38E-05**	

† Assumed equilibrium

‡ Calcuated over 1.52 m (5ft) as the sum of 10% of the 0.15m (0.5ft) surface soil EPC and 90% of the 1.37 m (4.5ft) subsurface soil EPC

Construction Worker Gross Total Effective Radiological Dose Rate (mrem/yr) - Year 0							
			Pathway-Specific Dose Prediction				
Source	Radionuclide	Weighted Gross EPC‡ (pCi/g)	External	Inhalation	Soil	Total	Fraction
Total Soil (0 to 1.52 m bgs) (0 to 5 ft bgs)	Ac-227†	0.05	2.01E-02	2.30E-02	6.10E-03	4.92E-02	0.00
	Pa-231†	0.05	2.25E-03	6.13E-03	3.74E-03	1.21E-02	0.00
	Pb-210+D†	6.91	1.12E-02	5.56E-02	1.31E+00	1.38E+00	0.07
	Ra-226+D	6.91	1.59E+01	5.47E-02	2.18E-01	1.61E+01	0.88
	Th-230	7.43	5.45E-03	6.08E-01	1.59E-01	7.72E-01	0.04
	U-234	1.20	9.15E-05	9.23E-03	6.01E-03	1.53E-02	0.00
	U-235	0.05	7.63E-03	3.50E-04	2.43E-04	8.22E-03	0.00
	U-238	1.19	4.01E-02	7.77E-03	5.86E-03	5.37E-02	0.00
					Total:	**1.84E+01**	

† Assumed equilibrium

‡ Calcuated over 1.52 m (5ft) as the sum of 10% of the 0.15m (0.5ft) surface soil EPC and 90% of the 1.37 m (4.5ft) subsurface soil EPC

Construction Worker Gross Total Effective Radiological Dose Rate (mrem/yr) - Year 1,000							
			Pathway-Specific Dose Prediction				
Source	Radionuclide	Weighted Gross EPC‡ (pCi/g)	External	Inhalation	Soil	Total	Fraction
Total Soil (0 to 1.52 m bgs) (0 to 5 ft bgs)	Ac-227†	0.05	2.57E-19	2.93E-19	7.77E-20	6.28E-19	0.00
	Pa-231†	0.05	1.14E-03	1.51E-03	5.20E-04	3.17E-03	0.00
	Pb-210+D†	6.91	3.32E-16	1.65E-15	3.89E-14	4.09E-14	0.00
	Ra-226+D	6.91	1.03E+01	7.17E-02	1.00E+00	1.13E+01	0.61
	Th-230	7.43	5.86E+00	6.24E-01	7.05E-01	7.19E+00	0.39
	U-234	1.20	2.11E-03	8.35E-04	6.19E-04	3.57E-03	0.00
	U-235	0.05	4.68E-04	5.19E-05	2.51E-05	5.45E-04	0.00
	U-238	1.19	2.33E-03	4.54E-04	3.42E-04	3.13E-03	0.00
					Total:	**1.85E+01**	

† Assumed equilibrium

‡ Calcuated over 1.52 m (5ft) as the sum of 10% of the 0.15m (0.5ft) surface soil EPC and 90% of the 1.37 m (4.5ft) subsurface soil EPC

Construction Worker Background Incremental Lifetime Cancer Risk - Year 0							
			Pathway-Specific Risk Estimate				
Source	Radionuclide	Weighted Mean Background‡ (pCi/g)	External	Inhalation	Soil	Total	Fraction
Total Soil (0 to 1.52 m bgs) (0 to 5 ft bgs)	Ac-227†	0.04	1.17E-08	1.73E-09	6.62E-10	1.41E-08	0.01
	Pa-231†	0.04	1.32E-09	6.58E-10	2.44E-10	2.22E-09	0.00
	Pb-210+D†	0.85	7.80E-10	5.73E-09	8.00E-08	8.65E-08	0.05
	Ra-226+D	0.85	1.57E-06	5.43E-09	1.34E-08	1.59E-06	0.91
	Th-230	0.86	4.96E-10	6.44E-09	2.82E-09	9.76E-09	0.01
	U-234	0.71	3.94E-11	4.34E-09	1.86E-09	6.23E-09	0.00
	U-235	0.04	4.44E-09	2.07E-10	1.01E-10	4.75E-09	0.00
	U-238	0.75	1.83E-08	3.89E-09	2.48E-09	2.47E-08	0.01
					Total:	**1.74E-06**	

† Assumed equilibrium

‡ Calcuated over 1.52 m (5ft) as the sum of 10% of the 0.15m (0.5ft) surface soil EPC and 90% of the 1.37 m (4.5ft) subsurface soil EPC

Construction Worker Background Incremental Lifetime Cancer Risk - Year 1,000							
			Pathway-Specific Risk Estimate				
Source	Radionuclide	Weighted Mean Background‡ (pCi/g)	External	Inhalation	Soil	Total	Fraction
Total Soil (0 to 1.52 m bgs) (0 to 5 ft bgs)	Ac-227†	0.04	1.50E-25	2.20E-26	8.44E-27	1.80E-25	0.00
	Pa-231†	0.04	6.67E-10	1.24E-10	4.72E-11	8.38E-10	0.00
	Pb-210+D†	0.85	2.31E-23	1.70E-22	2.37E-21	2.56E-21	0.00
	Ra-226+D	0.85	1.01E-06	7.25E-09	6.09E-08	1.08E-06	0.65
	Th-230	0.86	5.41E-07	9.97E-09	3.41E-08	5.85E-07	0.35
	U-234	0.71	9.93E-10	2.74E-10	1.71E-10	1.44E-09	0.00
	U-235	0.04	2.73E-10	1.46E-11	6.85E-12	2.94E-10	0.00
	U-238	0.75	1.07E-09	2.27E-10	1.44E-10	1.44E-09	0.00
					Total:	**1.67E-06**	

† Assumed equilibrium

‡ Calcuated over 1.52 m (5ft) as the sum of 10% of the 0.15m (0.5ft) surface soil EPC and 90% of the 1.37 m (4.5ft) subsurface soil EPC

Construction Worker Background Total Effective Radiological Dose Rate (mrem/yr) - Year 0							
			Pathway-Specific Dose Prediction				
Source	Radionuclide	Weighted Mean Background‡ (pCi/g)	External	Inhalation	Soil	Total	Fraction
Total Soil (0 to 1.52 m bgs) (0 to 5 ft bgs)	Ac-227†	0.04	1.50E-02	1.71E-02	4.53E-03	3.66E-02	0.02
	Pa-231†	0.04	1.67E-03	4.56E-03	2.78E-03	9.01E-03	0.00
	Pb-210+D†	0.85	1.39E-03	6.88E-03	1.63E-01	1.71E-01	0.07
	Ra-226+D	0.85	1.96E+00	6.77E-03	2.70E-02	2.00E+00	0.85
	Th-230	0.86	6.28E-04	7.01E-02	1.84E-02	8.91E-02	0.04
	U-234	0.71	5.38E-05	5.42E-03	3.53E-03	9.01E-03	0.00
	U-235	0.04	5.67E-03	2.60E-04	1.81E-04	6.11E-03	0.00
	U-238	0.75	2.51E-02	4.88E-03	3.68E-03	3.37E-02	0.01
					Total:	**2.35E+00**	

† Assumed equilibrium

‡ Calcuated over 1.52 m (5ft) as the sum of 10% of the 0.15m (0.5ft) surface soil EPC and 90% of the 1.37 m (4.5ft) subsurface soil EPC

Construction Worker Background Total Effective Radiological Dose Rate (mrem/yr) - Year 1,000							
			Pathway-Specific Dose Prediction				
Source	Radionuclide	Weighted Mean Background‡ (pCi/g)	External	Inhalation	Soil	Total	Fraction
Total Soil (0 to 1.52 m bgs) (0 to 5 ft bgs)	Ac-227†	0.04	1.91E-19	2.18E-19	5.78E-20	4.66E-19	0.00
	Pa-231†	0.04	8.48E-04	1.12E-03	3.87E-04	2.35E-03	0.00
	Pb-210+D†	0.85	4.11E-17	2.04E-16	4.81E-15	5.06E-15	0.00
	Ra-226+D	0.85	1.27E+00	8.87E-03	1.24E-01	1.40E+00	0.63
	Th-230	0.86	6.77E-01	7.20E-02	8.14E-02	8.30E-01	0.37
	U-234	0.71	1.24E-03	4.90E-04	3.64E-04	2.10E-03	0.00
	U-235	0.04	3.48E-04	3.86E-05	1.86E-05	4.05E-04	0.00
	U-238	0.75	1.46E-03	2.85E-04	2.15E-04	1.96E-03	0.00
					Total:	**2.24E+00**	

† Assumed equilibrium

‡ Calcuated over 1.52 m (5ft) as the sum of 10% of the 0.15m (0.5ft) surface soil EPC and 90% of the 1.37 m (4.5ft) subsurface soil EPC

Construction Worker Net Incremental Lifetime Cancer Risk - Year 0							
		Weighted Net	Pathway-Specific Risk Estimate				
Source	Radionuclide	EPC‡ (pCi/g)	External	Inhalation	Soil	Total	Fraction
Total Soil (0 to 1.52 m bgs) (0 to 5 ft bgs)	Ac-227†	0.01	4.06E-09	5.97E-10	2.29E-10	4.88E-09	0.00
	Pa-231†	0.01	4.56E-10	2.27E-10	8.42E-11	7.67E-10	0.00
	Pb-210+D†	6.06	5.52E-09	4.06E-08	5.66E-07	6.12E-07	0.05
	Ra-226+D	6.06	1.11E-05	3.85E-08	9.48E-08	1.13E-05	0.94
	Th-230	6.57	3.80E-09	4.94E-08	2.16E-08	7.48E-08	0.01
	U-234	0.50	2.77E-11	3.05E-09	1.31E-09	4.38E-09	0.00
	U-235	0.01	1.54E-09	7.14E-11	3.48E-11	1.64E-09	0.00
	U-238	0.44	1.09E-08	2.31E-09	1.47E-09	1.47E-08	0.00
					Total:	**1.20E-05**	

† Assumed equilibrium

‡ Calcuated over 1.52 m (5ft) as the sum of 10% of the 0.15m (0.5ft) surface soil EPC and 90% of the 1.37 m (4.5ft) subsurface soil EPC

Construction Worker Net Incremental Lifetime Cancer Risk - Year 1,000							
		Weighted Net	Pathway-Specific Risk Estimate				
Source	Radionuclide	EPC‡ (pCi/g)	External	Inhalation	Soil	Total	Fraction
Total Soil (0 to 1.52 m bgs) (0 to 5 ft bgs)	Ac-227†	0.01	5.17E-26	7.62E-27	2.91E-27	6.23E-26	0.00
	Pa-231†	0.01	2.30E-10	4.30E-11	1.63E-11	2.90E-10	0.00
	Pb-210+D†	6.06	1.64E-22	1.20E-21	1.68E-20	1.81E-20	0.00
	Ra-226+D	6.06	7.19E-06	5.14E-08	4.32E-07	7.67E-06	0.63
	Th-230	6.57	4.15E-06	7.65E-08	2.61E-07	4.49E-06	0.37
	U-234	0.50	6.97E-10	1.92E-10	1.20E-10	1.01E-09	0.00
	U-235	0.01	9.42E-11	5.06E-12	2.37E-12	1.02E-10	0.00
	U-238	0.44	6.34E-10	1.35E-10	8.57E-11	8.54E-10	0.00
					Total:	**1.22E-05**	

† Assumed equilibrium

‡ Calcuated over 1.52 m (5ft) as the sum of 10% of the 0.15m (0.5ft) surface soil EPC and 90% of the 1.37 m (4.5ft) subsurface soil EPC

Construction Worker Net Total Effective Radiological Dose Rate (mrem/yr) - Year 0							
		Weighted Net	Pathway-Specific Dose Prediction				
Source	Radionuclide	EPC‡ (pCi/g)	External	Inhalation	Soil	Total	Fraction
Total Soil (0 to 1.52 m bgs) (0 to 5 ft bgs)	Ac-227†	0.01	5.17E-03	5.90E-03	1.57E-03	1.26E-02	0.00
	Pa-231†	0.01	5.78E-04	1.57E-03	9.61E-04	3.11E-03	0.00
	Pb-210+D†	6.06	9.83E-03	4.88E-02	1.15E+00	1.21E+00	0.08
	Ra-226+D	6.06	1.39E+01	4.80E-02	1.91E-01	1.41E+01	0.88
	Th-230	6.57	4.82E-03	5.38E-01	1.41E-01	6.83E-01	0.04
	U-234	0.50	3.78E-05	3.81E-03	2.48E-03	6.33E-03	0.00
	U-235	0.01	1.96E-03	8.99E-05	6.24E-05	2.11E-03	0.00
	U-238	0.44	1.49E-02	2.89E-03	2.18E-03	2.00E-02	0.00
					Total:	**1.61E+01**	

† Assumed equilibrium

‡ Calcuated over 1.52 m (5ft) as the sum of 10% of the 0.15m (0.5ft) surface soil EPC and 90% of the 1.37 m (4.5ft) subsurface soil EPC

Construction Worker Net Total Effective Radiological Dose Rate (mrem/yr) - Year 1,000							
		Weighted Net	Pathway-Specific Dose Prediction				
Source	Radionuclide	EPC‡ (pCi/g)	External	Inhalation	Soil	Total	Fraction
Total Soil (0 to 1.52 m bgs) (0 to 5 ft bgs)	Ac-227†	0.01	6.59E-20	7.53E-20	2.00E-20	1.61E-19	0.00
	Pa-231†	0.01	2.93E-04	3.87E-04	1.34E-04	8.13E-04	0.00
	Pb-210+D†	6.06	2.91E-16	1.44E-15	3.41E-14	3.58E-14	0.00
	Ra-226+D	6.06	8.99E+00	6.29E-02	8.76E-01	9.93E+00	0.61
	Th-230	6.57	5.19E+00	5.52E-01	6.24E-01	6.36E+00	0.39
	U-234	0.50	8.72E-04	3.44E-04	2.55E-04	1.47E-03	0.00
	U-235	0.01	1.20E-04	1.33E-05	6.44E-06	1.40E-04	0.00
	U-238	0.44	8.69E-04	1.69E-04	1.27E-04	1.17E-03	0.00
					Total:	**1.63E+01**	

† Assumed equilibrium

‡ Calcuated over 1.52 m (5ft) as the sum of 10% of the 0.15m (0.5ft) surface soil EPC and 90% of the 1.37 m (4.5ft) subsurface soil EPC

Table 6-12. Estimated incremental lifetime cancer risk and predicted effective radiological dose rates due to potential adolescent trespasser exposure to site soils. Risk and dose results are presented per unit activity for current (year 0) and modeled future (year 1,000) conditions and then scaled to represent the gross EPC contribution, mean backgroun contribution, and net site contribution. Total risk and dose estimates presented in boldface are summations across pathway-specific estimates for each radionuclide and the two soil horizons (surface and subsurface). The risk or dose attributable to each radionuclide is based on that radionuclide as the source term, but can include effects occurring due to exposure to its progeny. Fractions for each radionuclide represent the proportion of total risk or dose attributable to that radionuclide in a given soil horizon.

Adolescent Trespasser - Unit Incremental Lifetime Cancer Risk - Year 0								
		Unit	Pathway-Specific Risk Estimate					
Source	Radionuclide	Concentration (pCi/g)	External	Inhalation	Meat	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	1.00	7.33E-08	1.84E-09	7.01E-10	1.28E-09	7.71E-08	0.05
	Pa-231†	1.00	1.59E-08	9.92E-10	8.70E-08	6.71E-10	1.05E-07	0.07
	Pb-210+D†	1.00	2.67E-10	3.24E-10	2.09E-07	8.23E-09	2.18E-07	0.14
	Ra-226+D	1.00	5.25E-07	3.58E-10	8.70E-08	2.14E-09	6.15E-07	0.38
	Th-230	1.00	7.40E-10	3.94E-10	9.29E-10	3.15E-10	2.38E-09	0.00
	U-234	1.00	1.62E-11	2.96E-10	2.14E-09	2.30E-10	2.68E-09	0.00
	U-235	1.00	3.41E-08	2.66E-10	2.20E-09	2.35E-10	3.68E-08	0.02
	U-238	1.00	6.81E-09	2.51E-10	2.71E-09	2.91E-10	1.01E-08	0.01
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	1.00	4.49E-09	2.53E-12	2.25E-10	1.76E-12	4.72E-09	0.00
	Pa-231†	1.00	8.99E-10	1.39E-12	8.68E-08	9.42E-13	8.77E-08	0.05
	Pb-210+D†	1.00	3.29E-12	3.78E-13	1.94E-07	9.60E-12	1.94E-07	0.12
	Ra-226+D	1.00	7.34E-08	4.42E-13	1.79E-07	2.88E-12	2.52E-07	0.16
	Th-230	1.00	9.59E-11	4.74E-13	3.13E-10	3.79E-13	4.10E-10	0.00
	U-234	1.00	9.12E-14	3.82E-13	6.22E-10	2.97E-13	6.23E-10	0.00
	U-235	1.00	1.04E-09	3.43E-13	6.42E-10	3.04E-13	1.69E-09	0.00
	U-238	1.00	5.95E-10	3.25E-13	7.86E-10	3.76E-13	1.38E-09	0.00
† Assumed equilibrium						**Total:**	**1.61E-06**	

Adolescent Trespasser - Unit Incremental Lifetime Cancer Risk - Year 1,000								
		Unit	Pathway-Specific Risk Estimate					
Source	Radionuclide	Concentration (pCi/g)	External	Inhalation	Meat	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	1.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
	Pa-231†	1.00	1.16E-20	2.94E-22	1.45E-20	2.01E-22	2.65E-20	0.00
	Pb-210+D†	1.00	4.11E-24	3.09E-24	1.99E-21	7.83E-23	2.07E-21	0.00
	Ra-226+D	1.00	2.73E-07	2.54E-10	1.10E-07	3.86E-09	3.87E-07	0.32
	Th-230	1.00	1.27E-07	2.86E-10	5.04E-08	1.88E-09	1.80E-07	0.15
	U-234	1.00	3.88E-11	8.88E-14	1.54E-11	5.74E-13	5.48E-11	0.00
	U-235	1.00	9.09E-21	5.12E-23	6.80E-22	4.41E-23	9.86E-21	0.00
	U-238	1.00	3.72E-15	8.69E-18	1.47E-15	5.51E-17	5.25E-15	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	1.00	8.34E-26	5.07E-27	3.22E-27	3.53E-27	9.52E-26	0.00
	Pa-231†	1.00	6.44E-10	4.99E-11	5.17E-09	3.44E-11	5.89E-09	0.00
	Pb-210+D†	1.00	3.75E-25	3.83E-24	8.15E-21	9.73E-23	8.26E-21	0.00
	Ra-226+D	1.00	1.06E-07	1.78E-10	3.19E-07	2.72E-09	4.28E-07	0.35
	Th-230	1.00	5.65E-08	2.44E-10	1.66E-07	1.52E-09	2.25E-07	0.18
	U-234	1.00	1.18E-10	6.00E-12	4.09E-10	7.41E-12	5.40E-10	0.00
	U-235	1.00	1.94E-10	5.92E-12	1.78E-10	5.03E-12	3.83E-10	0.00
	U-238	1.00	6.36E-11	4.62E-12	8.29E-11	5.34E-12	1.57E-10	0.00
† Assumed equilibrium						**Total:**	**1.23E-06**	

Adolescent Trespasser - Unit Total Effective Radiological Dose Rate (mrem/yr) - Year 0								
		Unit Concentration	Pathway-Specific Dose Prediction					
Source	Radionuclide	(pCi/g)	External	Inhalation	Meat	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	1.00	1.99E-02	3.96E-03	1.34E-03	2.44E-03	2.76E-02	0.02
	Pa-231†	1.00	2.27E-03	1.12E-03	2.04E-01	1.32E-03	2.08E-01	0.17
	Pb-210+D†	1.00	8.58E-05	7.81E-05	1.42E-01	5.58E-03	1.48E-01	0.12
	Ra-226+D	1.00	1.10E-01	7.29E-05	1.22E-01	2.52E-03	2.34E-01	0.19
	Th-230	1.00	3.62E-05	7.07E-04	9.67E-04	3.57E-04	2.07E-03	0.00
	U-234	1.00	3.96E-06	7.04E-05	1.10E-03	1.18E-04	1.29E-03	0.00
	U-235	1.00	7.78E-03	6.48E-05	1.05E-03	1.13E-04	9.01E-03	0.01
	U-238	1.00	1.67E-03	6.13E-05	1.06E-03	1.14E-04	2.90E-03	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	1.00	1.05E-03	8.13E-07	3.70E-04	5.00E-07	1.42E-03	0.00
	Pa-231†	1.00	1.13E-04	2.31E-07	1.90E-01	2.70E-07	1.91E-01	0.15
	Pb-210+D†	1.00	1.14E-06	1.56E-08	1.31E-01	1.11E-06	1.31E-01	0.10
	Ra-226+D	1.00	1.53E-02	1.47E-08	2.88E-01	5.09E-07	3.03E-01	0.24
	Th-230	1.00	3.40E-06	1.42E-07	1.60E-04	7.15E-08	1.64E-04	0.00
	U-234	1.00	2.04E-08	1.43E-08	2.99E-04	2.39E-08	2.99E-04	0.00
	U-235	1.00	2.23E-04	1.31E-08	2.86E-04	2.28E-08	5.09E-04	0.00
	U-238	1.00	1.37E-04	1.24E-08	2.87E-04	2.30E-08	4.24E-04	0.00
† Assumed equilibrium						**Total:**	**1.26E+00**	

Adolescent Trespasser - Unit Total Effective Radiological Dose Rate (mrem/yr) - Year 1,000								
		Unit Concentration	Pathway-Specific Dose Prediction					
Source	Radionuclide	(pCi/g)	External	Inhalation	Meat	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	1.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
	Pa-231†	1.00	2.64E-15	4.65E-16	3.38E-14	3.90E-16	3.73E-14	0.00
	Pb-210+D†	1.00	1.32E-18	7.44E-19	1.35E-15	5.32E-17	1.41E-15	0.00
	Ra-226+D	1.00	5.69E-02	5.63E-05	9.85E-02	3.02E-03	1.59E-01	0.20
	Th-230	1.00	2.65E-02	3.30E-04	4.54E-02	1.53E-03	7.37E-02	0.09
	U-234	1.00	8.08E-06	1.04E-07	1.38E-05	4.66E-07	2.25E-05	0.00
	U-235	1.00	2.08E-15	2.08E-17	9.01E-16	2.73E-17	3.02E-15	0.00
	U-238	1.00	7.74E-10	1.03E-11	1.33E-09	4.48E-11	2.15E-09	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	1.00	1.94E-20	9.43E-21	5.30E-21	5.81E-21	4.00E-20	0.00
	Pa-231†	1.00	1.37E-04	7.79E-05	1.13E-02	5.85E-05	1.16E-02	0.01
	Pb-210+D†	1.00	1.31E-19	9.19E-19	5.52E-15	6.57E-17	5.58E-15	0.00
	Ra-226+D	1.00	2.21E-02	3.93E-05	3.40E-01	2.11E-03	3.64E-01	0.46
	Th-230	1.00	1.17E-02	2.91E-04	1.79E-01	1.23E-03	1.92E-01	0.24
	U-234	1.00	2.44E-05	1.99E-06	4.01E-04	4.64E-06	4.32E-04	0.00
	U-235	1.00	4.14E-05	2.74E-06	2.72E-04	3.16E-06	3.19E-04	0.00
	U-238	1.00	1.46E-05	1.06E-06	3.05E-05	1.96E-06	4.82E-05	0.00
† Assumed equilibrium						**Total:**	**8.01E-01**	

Adolescent Trespasser Gross Incremental Lifetime Cancer Risk - Year 0								
		Gross EPC	Pathway-Specific Risk Estimate					
Source	Radionuclide	(pCi/g)	External	Inhalation	Meat	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.04	2.95E-09	7.40E-11	2.82E-11	5.14E-11	3.11E-09	0.00
	Pa-231†	0.04	6.39E-10	4.00E-11	3.51E-09	2.70E-11	4.21E-09	0.00
	Pb-210+D†	3.13	8.37E-10	1.01E-09	6.54E-07	2.58E-08	6.82E-07	0.12
	Ra-226+D	3.13	1.64E-06	1.12E-09	2.72E-07	6.70E-09	1.92E-06	0.33
	Th-230	2.66	1.96E-09	1.05E-09	2.47E-09	8.35E-10	6.31E-09	0.00
	U-234	0.89	1.44E-11	2.62E-10	1.90E-09	2.04E-10	2.38E-09	0.00
	U-235	0.04	1.37E-09	1.07E-11	8.85E-11	9.48E-12	1.48E-09	0.00
	U-238	0.92	6.23E-09	2.30E-10	2.48E-09	2.66E-10	9.20E-09	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.05	2.31E-10	1.30E-13	1.16E-11	9.06E-14	2.43E-10	0.00
	Pa-231†	0.05	4.63E-11	7.15E-14	4.47E-09	4.85E-14	4.52E-09	0.00
	Pb-210+D†	7.33	2.41E-11	2.77E-12	1.42E-06	7.03E-11	1.42E-06	0.24
	Ra-226+D	7.33	5.38E-07	3.24E-12	1.31E-06	2.11E-11	1.85E-06	0.31
	Th-230	7.96	7.63E-10	3.77E-12	2.49E-09	3.02E-12	3.26E-09	0.00
	U-234	1.24	1.13E-13	4.72E-13	7.70E-10	3.68E-13	7.71E-10	0.00
	U-235	0.05	5.38E-11	1.77E-14	3.30E-11	1.57E-14	8.68E-11	0.00
	U-238	1.22	7.25E-10	3.95E-13	9.57E-10	4.57E-13	1.68E-09	0.00
† Assumed equilibrium						**Total:**	**5.91E-06**	

Adolescent Trespasser Gross Incremental Lifetime Cancer Risk - Year 1,000								
		Gross EPC	Pathway-Specific Risk Estimate					
Source	Radionuclide	(pCi/g)	External	Inhalation	Meat	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
	Pa-231†	0.04	4.67E-22	1.18E-23	5.82E-22	8.10E-24	1.07E-21	0.00
	Pb-210+D†	3.13	1.29E-23	9.66E-24	6.23E-21	2.45E-22	6.50E-21	0.00
	Ra-226+D	3.13	8.54E-07	7.97E-10	3.45E-07	1.21E-08	1.21E-06	0.18
	Th-230	2.66	3.38E-07	7.59E-10	1.34E-07	4.99E-09	4.78E-07	0.07
	U-234	0.89	3.44E-11	7.89E-14	1.36E-11	5.10E-13	4.87E-11	0.00
	U-235	0.04	3.66E-22	2.06E-24	2.74E-23	1.78E-24	3.98E-22	0.00
	U-238	0.92	3.40E-15	7.95E-18	1.35E-15	5.04E-17	4.81E-15	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.05	4.29E-27	2.61E-28	1.66E-28	1.82E-28	4.90E-27	0.00
	Pa-231†	0.05	3.32E-11	2.57E-12	2.66E-10	1.77E-12	3.03E-10	0.00
	Pb-210+D†	7.33	2.75E-24	2.81E-23	5.98E-20	7.13E-22	6.05E-20	0.00
	Ra-226+D	7.33	7.78E-07	1.31E-09	2.34E-06	1.99E-08	3.14E-06	0.47
	Th-230	7.96	4.50E-07	1.94E-09	1.32E-06	1.21E-08	1.79E-06	0.27
	U-234	1.24	1.45E-10	7.43E-12	5.05E-10	9.17E-12	6.67E-10	0.00
	U-235	0.05	1.00E-11	3.05E-13	9.15E-12	2.59E-13	1.97E-11	0.00
	U-238	1.22	7.75E-11	5.62E-12	1.01E-10	6.50E-12	1.91E-10	0.00
† Assumed equilibrium						**Total:**	**6.62E-06**	

Adolescent Trespasser Gross Total Effective Radiological Dose Rate (mrem/yr) - Year 0								
		Gross EPC	Pathway-Specific Dose Prediction					
Source	Radionuclide	(pCi/g)	External	Inhalation	Meat	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.04	8.00E-04	1.60E-04	5.40E-05	9.83E-05	1.11E-03	0.00
	Pa-231†	0.04	9.13E-05	4.51E-05	8.21E-03	5.31E-05	8.40E-03	0.00
	Pb-210+D†	3.13	2.69E-04	2.45E-04	4.44E-01	1.75E-02	4.62E-01	0.10
	Ra-226+D	3.13	3.43E-01	2.28E-04	3.83E-01	7.88E-03	7.34E-01	0.17
	Th-230	2.66	9.60E-05	1.88E-03	2.57E-03	9.48E-04	5.49E-03	0.00
	U-234	0.89	3.52E-06	6.25E-05	9.77E-04	1.05E-04	1.15E-03	0.00
	U-235	0.04	3.14E-04	2.61E-06	4.23E-05	4.53E-06	3.63E-04	0.00
	U-238	0.92	1.53E-03	5.61E-05	9.69E-04	1.04E-04	2.66E-03	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.05	5.39E-05	4.19E-08	1.90E-05	2.58E-08	7.30E-05	0.00
	Pa-231†	0.05	5.84E-06	1.19E-08	9.81E-03	1.39E-08	9.81E-03	0.00
	Pb-210+D†	7.33	8.34E-06	1.14E-07	9.60E-01	8.15E-06	9.60E-01	0.22
	Ra-226+D	7.33	1.12E-01	1.07E-07	2.11E+00	3.73E-06	2.22E+00	0.50
	Th-230	7.96	2.70E-05	1.13E-06	1.28E-03	5.69E-07	1.30E-03	0.00
	U-234	1.24	2.53E-08	1.76E-08	3.69E-04	2.96E-08	3.69E-04	0.00
	U-235	0.05	1.15E-05	6.76E-10	1.47E-05	1.17E-09	2.62E-05	0.00
	U-238	1.22	1.67E-04	1.51E-08	3.50E-04	2.81E-08	5.17E-04	0.00
† Assumed equilibrium						**Total:**	**4.41E+00**	

Adolescent Trespasser Gross Total Effective Radiological Dose Rate (mrem/yr) - Year 1,000								
		Gross EPC	Pathway-Specific Dose Prediction					
Source	Radionuclide	(pCi/g)	External	Inhalation	Meat	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
	Pa-231†	0.04	1.06E-16	1.87E-17	1.36E-15	1.57E-17	1.50E-15	0.00
	Pb-210+D†	3.13	4.12E-18	2.33E-18	4.23E-15	1.67E-16	4.40E-15	0.00
	Ra-226+D	3.13	1.78E-01	1.76E-04	3.08E-01	9.45E-03	4.96E-01	0.10
	Th-230	2.66	7.04E-02	8.77E-04	1.21E-01	4.05E-03	1.96E-01	0.04
	U-234	0.89	7.17E-06	9.22E-08	1.23E-05	4.14E-07	2.00E-05	0.00
	U-235	0.04	8.36E-17	8.39E-19	3.63E-17	1.10E-18	1.22E-16	0.00
	U-238	0.92	7.08E-10	9.41E-12	1.21E-09	4.10E-11	1.97E-09	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.05	1.00E-21	4.86E-22	2.73E-22	2.99E-22	2.06E-21	0.00
	Pa-231†	0.05	7.07E-06	4.01E-06	5.83E-04	3.01E-06	5.97E-04	0.00
	Pb-210+D†	7.33	9.59E-19	6.74E-18	4.04E-14	4.82E-16	4.09E-14	0.00
	Ra-226+D	7.33	1.62E-01	2.88E-04	2.49E+00	1.55E-02	2.67E+00	0.55
	Th-230	7.96	9.33E-02	2.32E-03	1.42E+00	9.76E-03	1.53E+00	0.31
	U-234	1.24	3.01E-05	2.46E-06	4.96E-04	5.74E-06	5.34E-04	0.00
	U-235	0.05	2.13E-06	1.41E-07	1.40E-05	1.63E-07	1.64E-05	0.00
	U-238	1.22	1.78E-05	1.28E-06	3.72E-05	2.38E-06	5.87E-05	0.00
† Assumed equilibrium						**Total:**	**4.89E+00**	

Adolescent Trespasser Background Incremental Lifetime Cancer Risk - Year 0								
			Pathway-Specific Risk Estimate					
Source	Radionuclide	Mean Background (pCi/g)	External	Inhalation	Meat	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.05	3.41E-09	8.53E-11	3.26E-11	5.93E-11	3.58E-09	0.00
	Pa-231†	0.05	7.37E-10	4.61E-11	4.05E-09	3.12E-11	4.86E-09	0.00
	Pb-210+D†	0.74	1.99E-10	2.41E-10	1.56E-07	6.13E-09	1.62E-07	0.16
	Ra-226+D	0.74	3.91E-07	2.66E-10	6.47E-08	1.59E-09	4.58E-07	0.44
	Th-230	0.93	6.86E-10	3.65E-10	8.61E-10	2.92E-10	2.20E-09	0.00
	U-234	0.91	1.48E-11	2.70E-10	1.95E-09	2.10E-10	2.45E-09	0.00
	U-235	0.05	1.59E-09	1.24E-11	1.02E-10	1.09E-11	1.71E-09	0.00
	U-238	0.86	5.86E-09	2.16E-10	2.33E-09	2.50E-10	8.65E-09	0.01
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.04	1.64E-10	9.22E-14	8.19E-12	6.41E-14	1.72E-10	0.00
	Pa-231†	0.04	3.27E-11	5.06E-14	3.16E-09	3.43E-14	3.20E-09	0.00
	Pb-210+D†	0.87	2.86E-12	3.28E-13	1.68E-07	8.32E-12	1.68E-07	0.16
	Ra-226+D	0.87	6.36E-08	3.83E-13	1.55E-07	2.50E-12	2.18E-07	0.21
	Th-230	0.85	8.15E-11	4.02E-13	2.66E-10	3.22E-13	3.48E-10	0.00
	U-234	0.68	6.23E-14	2.61E-13	4.25E-10	2.03E-13	4.26E-10	0.00
	U-235	0.04	3.80E-11	1.25E-14	2.34E-11	1.11E-14	6.14E-11	0.00
	U-238	0.73	4.36E-10	2.38E-13	5.76E-10	2.75E-13	1.01E-09	0.00
† Assumed equilibrium						**Total:**	**1.03E-06**	

Adolescent Trespasser Background Incremental Lifetime Cancer Risk - Year 1,000								
			Pathway-Specific Risk Estimate					
Source	Radionuclide	Mean Background (pCi/g)	External	Inhalation	Meat	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
	Pa-231†	0.05	5.39E-22	1.36E-23	6.72E-22	9.35E-24	1.23E-21	0.00
	Pb-210+D†	0.74	3.06E-24	2.30E-24	1.48E-21	5.83E-23	1.54E-21	0.00
	Ra-226+D	0.74	2.03E-07	1.89E-10	8.20E-08	2.87E-09	2.88E-07	0.28
	Th-230	0.93	1.18E-07	2.65E-10	4.67E-08	1.74E-09	1.67E-07	0.16
	U-234	0.91	3.54E-11	8.11E-14	1.40E-11	5.24E-13	5.00E-11	0.00
	U-235	0.05	4.23E-22	2.38E-24	3.16E-23	2.05E-24	4.59E-22	0.00
	U-238	0.86	3.20E-15	7.48E-18	1.27E-15	4.74E-17	4.52E-15	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.04	3.04E-27	1.85E-28	1.17E-28	1.29E-28	3.47E-27	0.00
	Pa-231†	0.04	2.35E-11	1.82E-12	1.88E-10	1.25E-12	2.15E-10	0.00
	Pb-210+D†	0.87	3.25E-25	3.32E-24	7.07E-21	8.43E-23	7.16E-21	0.00
	Ra-226+D	0.87	9.20E-08	1.54E-10	2.77E-07	2.36E-09	3.71E-07	0.36
	Th-230	0.85	4.80E-08	2.07E-10	1.41E-07	1.29E-09	1.91E-07	0.19
	U-234	0.68	8.03E-11	4.10E-12	2.79E-10	5.06E-12	3.69E-10	0.00
	U-235	0.04	7.08E-12	2.16E-13	6.47E-12	1.83E-13	1.39E-11	0.00
	U-238	0.73	4.66E-11	3.38E-12	6.07E-11	3.91E-12	1.15E-10	0.00
† Assumed equilibrium						**Total:**	**1.02E-06**	

Adolescent Trespasser Background Total Effective Radiological Dose Rate (mrem/yr) - Year 0								
		Mean Background	Pathway-Specific Dose Prediction					
Source	Radionuclide	(pCi/g)	External	Inhalation	Meat	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.05	9.23E-04	1.84E-04	6.23E-05	1.13E-04	1.28E-03	0.00
	Pa-231†	0.05	1.05E-04	5.21E-05	9.47E-03	6.12E-05	9.69E-03	0.01
	Pb-210+D†	0.74	6.39E-05	5.82E-05	1.06E-01	4.16E-03	1.10E-01	0.16
	Ra-226+D	0.74	8.16E-02	5.43E-05	9.10E-02	1.87E-03	1.75E-01	0.25
	Th-230	0.93	3.35E-05	6.56E-04	8.96E-04	3.31E-04	1.92E-03	0.00
	U-234	0.91	3.61E-06	6.43E-05	1.00E-03	1.08E-04	1.18E-03	0.00
	U-235	0.05	3.62E-04	3.01E-06	4.88E-05	5.23E-06	4.19E-04	0.00
	U-238	0.86	1.44E-03	5.28E-05	9.11E-04	9.78E-05	2.50E-03	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.04	3.82E-05	2.96E-08	1.35E-05	1.82E-08	5.17E-05	0.00
	Pa-231†	0.04	4.13E-06	8.43E-09	6.94E-03	9.82E-09	6.94E-03	0.01
	Pb-210+D†	0.87	9.87E-07	1.35E-08	1.14E-01	9.64E-07	1.14E-01	0.17
	Ra-226+D	0.87	1.32E-02	1.27E-08	2.50E-01	4.42E-07	2.63E-01	0.38
	Th-230	0.85	2.89E-06	1.20E-07	1.36E-04	6.07E-08	1.39E-04	0.00
	U-234	0.68	1.39E-08	9.74E-09	2.04E-04	1.64E-08	2.04E-04	0.00
	U-235	0.04	8.11E-06	4.78E-10	1.04E-05	8.30E-10	1.85E-05	0.00
	U-238	0.73	1.00E-04	9.10E-09	2.10E-04	1.69E-08	3.11E-04	0.00
† Assumed equilibrium						**Total:**	**6.86E-01**	

Adolescent Trespasser Background Total Effective Radiological Dose Rate (mrem/yr) - Year 1,000								
		Mean Background	Pathway-Specific Dose Prediction					
Source	Radionuclide	(pCi/g)	External	Inhalation	Meat	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
	Pa-231†	0.05	1.23E-16	2.16E-17	1.57E-15	1.81E-17	1.74E-15	0.00
	Pb-210+D†	0.74	9.80E-19	5.54E-19	1.01E-15	3.96E-17	1.05E-15	0.00
	Ra-226+D	0.74	4.24E-02	4.19E-05	7.33E-02	2.25E-03	1.18E-01	0.18
	Th-230	0.93	2.46E-02	3.06E-04	4.21E-02	1.41E-03	6.84E-02	0.10
	U-234	0.91	7.37E-06	9.47E-08	1.26E-05	4.25E-07	2.05E-05	0.00
	U-235	0.05	9.65E-17	9.68E-19	4.19E-17	1.27E-18	1.41E-16	0.00
	U-238	0.86	6.66E-10	8.84E-12	1.14E-09	3.85E-11	1.85E-09	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.04	7.08E-22	3.44E-22	1.93E-22	2.12E-22	1.46E-21	0.00
	Pa-231†	0.04	5.00E-06	2.84E-06	4.12E-04	2.13E-06	4.22E-04	0.00
	Pb-210+D†	0.87	1.13E-19	7.97E-19	4.78E-15	5.70E-17	4.84E-15	0.00
	Ra-226+D	0.87	1.91E-02	3.41E-05	2.95E-01	1.83E-03	3.16E-01	0.47
	Th-230	0.85	9.95E-03	2.47E-04	1.52E-01	1.04E-03	1.63E-01	0.24
	U-234	0.68	1.66E-05	1.36E-06	2.74E-04	3.17E-06	2.95E-04	0.00
	U-235	0.04	1.51E-06	9.99E-08	9.91E-06	1.15E-07	1.16E-05	0.00
	U-238	0.73	1.07E-05	7.73E-07	2.24E-05	1.43E-06	3.53E-05	0.00
† Assumed equilibrium						**Total:**	**6.66E-01**	

Adolescent Trespasser Net Incremental Lifetime Cancer Risk - Year 0								
		Net EPC	Pathway-Specific Risk Estimate					
Source	Radionuclide	(pCi/g)	External	Inhalation	Meat	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.00	1.87E-10	4.68E-12	1.79E-12	3.25E-12	1.97E-10	0.00
	Pa-231†	0.00	4.04E-11	2.53E-12	2.22E-10	1.71E-12	2.67E-10	0.00
	Pb-210+D†	2.39	6.38E-10	7.73E-10	4.99E-07	1.96E-08	5.20E-07	0.11
	Ra-226+D	2.39	1.25E-06	8.54E-10	2.08E-07	5.11E-09	1.47E-06	0.30
	Th-230	1.73	1.28E-09	6.80E-10	1.60E-09	5.43E-10	4.11E-09	0.00
	U-234†	0.05	8.88E-13	1.62E-11	1.17E-10	1.26E-11	1.47E-10	0.00
	U-235‡	0.00	8.70E-11	6.78E-13	5.60E-12	6.00E-13	9.39E-11	0.00
	U-238	0.05	3.73E-10	1.37E-11	1.48E-10	1.59E-11	5.50E-10	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.02	6.76E-11	3.81E-14	3.39E-12	2.65E-14	7.10E-11	0.00
	Pa-231†	0.02	1.35E-11	2.09E-14	1.31E-09	1.42E-14	1.32E-09	0.00
	Pb-210+D†	6.46	2.13E-11	2.44E-12	1.25E-06	6.20E-11	1.25E-06	0.26
	Ra-226+D	6.46	4.74E-07	2.86E-12	1.15E-06	1.86E-11	1.63E-06	0.33
	Th-230	7.11	6.82E-10	3.37E-12	2.23E-09	2.70E-12	2.91E-09	0.00
	U-234	0.55	5.05E-14	2.11E-13	3.45E-10	1.65E-13	3.45E-10	0.00
	U-235	0.02	1.57E-11	5.17E-15	9.66E-12	4.58E-15	2.54E-11	0.00
	U-238	0.49	2.89E-10	1.58E-13	3.81E-10	1.82E-13	6.71E-10	0.00
						Total:	**4.88E-06**	

† Assumed equilibrium

‡ Assumed natural uranium ratio

Adolescent Trespasser Net Incremental Lifetime Cancer Risk - Year 1,000								
		Net EPC	Pathway-Specific Risk Estimate					
Source	Radionuclide	(pCi/g)	External	Inhalation	Meat	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
	Pa-231†	0.00	2.96E-23	7.49E-25	3.69E-23	5.13E-25	6.77E-23	0.00
	Pb-210+D†	2.39	9.82E-24	7.36E-24	4.75E-21	1.87E-22	4.95E-21	0.00
	Ra-226+D	2.39	6.51E-07	6.07E-10	2.63E-07	9.21E-09	9.24E-07	0.17
	Th-230	1.73	2.20E-07	4.94E-10	8.71E-08	3.25E-09	3.11E-07	0.06
	U-234†	0.05	2.12E-12	4.86E-15	8.40E-13	3.14E-14	3.00E-12	0.00
	U-235‡	0.00	2.32E-23	1.30E-25	1.73E-24	1.12E-25	2.52E-23	0.00
	U-238	0.05	2.04E-16	4.76E-19	8.05E-17	3.02E-18	2.88E-16	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.02	1.26E-27	7.64E-29	4.85E-29	5.32E-29	1.43E-27	0.00
	Pa-231†	0.02	9.70E-12	7.51E-13	7.78E-11	5.18E-13	8.88E-11	0.00
	Pb-210+D†	6.46	2.42E-24	2.48E-23	5.27E-20	6.29E-22	5.34E-20	0.00
	Ra-226+D	6.46	6.86E-07	1.15E-09	2.06E-06	1.76E-08	2.77E-06	0.49
	Th-230	7.11	4.02E-07	1.74E-09	1.18E-06	1.08E-08	1.60E-06	0.29
	U-234	0.55	6.51E-11	3.33E-12	2.26E-10	4.10E-12	2.99E-10	0.00
	U-235	0.02	2.93E-12	8.91E-14	2.67E-12	7.58E-14	5.76E-12	0.00
	U-238	0.49	3.09E-11	2.24E-12	4.03E-11	2.59E-12	7.60E-11	0.00
						Total:	**5.60E-06**	

† Assumed equilibrium

‡ Assumed natural uranium ratio

Adolescent Trespasser Net Total Effective Radiological Dose Rate (mrem/yr) - Year 0								
		Net EPC	Pathway-Specific Dose Prediction					
Source	Radionuclide	(pCi/g)	External	Inhalation	Meat	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.00	5.06E-05	1.01E-05	3.42E-06	6.22E-06	7.04E-05	0.00
	Pa-231†	0.00	5.78E-06	2.86E-06	5.20E-04	3.36E-06	5.32E-04	0.00
	Pb-210+D†	2.39	2.05E-04	1.86E-04	3.38E-01	1.33E-02	3.52E-01	0.09
	Ra-226+D	2.39	2.62E-01	1.74E-04	2.92E-01	6.01E-03	5.60E-01	0.15
	Th-230	1.73	6.25E-05	1.22E-03	1.67E-03	6.17E-04	3.57E-03	0.00
	U-234†	0.05	2.17E-07	3.85E-06	6.02E-05	6.47E-06	7.07E-05	0.00
	U-235‡	0.00	1.99E-05	1.65E-07	2.68E-06	2.87E-07	2.30E-05	0.00
	U-238	0.05	9.14E-05	3.36E-06	5.80E-05	6.22E-06	1.59E-04	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.02	1.58E-05	1.22E-08	5.57E-06	7.54E-09	2.14E-05	0.00
	Pa-231†	0.02	1.71E-06	3.49E-09	2.87E-03	4.06E-09	2.87E-03	0.00
	Pb-210+D†	6.46	7.35E-06	1.00E-07	8.47E-01	7.19E-06	8.47E-01	0.23
	Ra-226+D	6.46	9.86E-02	9.47E-08	1.86E+00	3.29E-06	1.96E+00	0.53
	Th-230	7.11	2.42E-05	1.01E-06	1.14E-03	5.08E-07	1.17E-03	0.00
	U-234	0.55	1.13E-08	7.90E-09	1.65E-04	1.33E-08	1.65E-04	0.00
	U-235	0.02	3.35E-06	1.98E-10	4.31E-06	3.43E-10	7.66E-06	0.00
	U-238	0.49	6.65E-05	6.03E-09	1.39E-04	1.12E-08	2.06E-04	0.00
						Total:	**3.73E+00**	

† Assumed equilibrium

‡ Assumed natural uranium ratio

Adolescent Trespasser Net Total Effective Radiological Dose Rate (mrem/yr) - Year 1,000								
		Net EPC	Pathway-Specific Dose Prediction					
Source	Radionuclide	(pCi/g)	External	Inhalation	Meat	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
	Pa-231†	0.00	6.74E-18	1.19E-18	8.63E-17	9.95E-19	9.52E-17	0.00
	Pb-210+D†	2.39	3.14E-18	1.78E-18	3.22E-15	1.27E-16	3.36E-15	0.00
	Ra-226+D	2.39	1.36E-01	1.34E-04	2.35E-01	7.20E-03	3.78E-01	0.09
	Th-230	1.73	4.58E-02	5.71E-04	7.84E-02	2.63E-03	1.27E-01	0.03
	U-234†	0.05	4.42E-07	5.68E-09	7.57E-07	2.55E-08	1.23E-06	0.00
	U-235‡	0.00	5.29E-18	5.31E-20	2.30E-18	6.97E-20	7.71E-18	0.00
	U-238	0.05	4.24E-11	5.63E-13	7.25E-11	2.45E-12	1.18E-10	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.02	2.93E-22	1.42E-22	7.99E-23	8.75E-23	6.02E-22	0.00
	Pa-231†	0.02	2.07E-06	1.17E-06	1.71E-04	8.81E-07	1.75E-04	0.00
	Pb-210+D†	6.46	8.45E-19	5.94E-18	3.56E-14	4.25E-16	3.61E-14	0.00
	Ra-226+D	6.46	1.43E-01	2.54E-04	2.20E+00	1.36E-02	2.36E+00	0.56
	Th-230	7.11	8.33E-02	2.07E-03	1.27E+00	8.72E-03	1.36E+00	0.32
	U-234	0.55	1.35E-05	1.10E-06	2.22E-04	2.57E-06	2.39E-04	0.00
	U-235	0.02	6.24E-07	4.13E-08	4.10E-06	4.75E-08	4.81E-06	0.00
	U-238	0.49	7.10E-06	5.12E-07	1.48E-05	9.50E-07	2.34E-05	0.00
						Total:	**4.22E+00**	

† Assumed equilibrium

‡ Assumed natural uranium ratio

Table 6-13. Estimated incremental lifetime cancer risk and predicted effective radiological dose rates due to potential adult trespasser exposure to site soils. Risk and dose results are presented per unit activity for current (year 0) and modeled future (year 1,000) conditions and then scaled to represent the gross EPC contribution, mean backgroun contribution, and net site contribution. Total risk and dose estimates presented in boldface are summations across pathway-specific estimates for each radionuclide and the two soil horizons (surface and subsurface). The risk or dose attributable to each radionuclide is based on that radionuclide as the source term, but can include effects occurring due to exposure to its progeny. Fractions for each radionuclide represent the proportion of total risk or dose attributable to that radionuclide in a given soil horizon.

Adult Trespasser - Unit Incremental Lifetime Cancer Risk - Year 0

Source	Radionuclide	Unit Concentration (pCi/g)	Pathway-Specific Risk Estimate				Total	Fraction
			External	Inhalation	Meat	Soil		
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	1.00	1.38E-07	3.46E-09	3.83E-11	2.41E-09	1.44E-07	0.06
	Pa-231†	1.00	7.08E-08	3.41E-09	6.96E-09	2.32E-09	8.35E-08	0.03
	Pb-210+D†	1.00	7.25E-10	8.76E-10	1.64E-08	2.22E-08	4.02E-08	0.02
	Ra-226+D	1.00	1.74E-06	1.38E-09	1.20E-08	1.21E-08	1.77E-06	0.71
	Th-230	1.00	7.74E-09	1.31E-09	1.24E-10	1.08E-09	1.02E-08	0.00
	U-234	1.00	4.51E-11	8.13E-10	1.71E-10	6.33E-10	1.66E-09	0.00
	U-235	1.00	9.40E-08	7.32E-10	1.76E-10	6.48E-10	9.56E-08	0.04
	U-238	1.00	1.88E-08	6.91E-10	2.16E-10	8.00E-10	2.05E-08	0.01
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	1.00	1.17E-08	1.97E-11	1.70E-11	1.37E-11	1.17E-08	0.00
	Pa-231†	1.00	5.63E-09	2.16E-11	8.24E-09	1.48E-11	1.39E-08	0.01
	Pb-210+D†	1.00	9.03E-12	3.17E-12	1.53E-08	8.05E-11	1.54E-08	0.01
	Ra-226+D	1.00	2.45E-07	5.92E-12	2.07E-08	5.78E-11	2.66E-07	0.11
	Th-230	1.00	1.07E-09	5.28E-12	9.18E-11	4.41E-12	1.17E-09	0.00
	U-234	1.00	3.59E-13	4.12E-12	5.95E-11	3.21E-12	6.72E-11	0.00
	U-235	1.00	3.44E-09	3.71E-12	6.26E-11	3.28E-12	3.51E-09	0.00
	U-238	1.00	1.95E-09	3.50E-12	7.52E-11	4.05E-12	2.03E-09	0.00
						Total:	**2.48E-06**	

† Assumed equilibrium

Adult Trespasser - Unit Incremental Lifetime Cancer Risk - Year 1,000

Source	Radionuclide	Unit Concentration (pCi/g)	Pathway-Specific Risk Estimate				Total	Fraction
			External	Inhalation	Meat	Soil		
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	1.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
	Pa-231†	1.00	3.19E-20	8.06E-22	1.15E-21	5.52E-22	3.44E-20	0.00
	Pb-210+D†	1.00	1.11E-23	8.33E-24	1.56E-22	2.11E-22	3.87E-22	0.00
	Ra-226+D	1.00	9.04E-07	8.41E-10	1.06E-08	1.28E-08	9.28E-07	0.47
	Th-230	1.00	4.25E-07	9.49E-10	4.88E-09	6.26E-09	4.37E-07	0.22
	U-234	1.00	1.30E-10	2.95E-13	1.49E-12	1.91E-12	1.33E-10	0.00
	U-235	1.00	2.50E-20	1.41E-22	5.44E-23	1.21E-22	2.54E-20	0.00
	U-238	1.00	1.24E-14	2.89E-17	1.42E-16	1.84E-16	1.28E-14	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	1.00	2.17E-25	1.32E-26	2.43E-28	9.18E-27	2.40E-25	0.00
	Pa-231†	1.00	2.12E-09	1.64E-10	4.90E-10	1.13E-10	2.88E-09	0.00
	Pb-210+D†	1.00	1.03E-24	1.05E-23	6.45E-22	2.66E-22	9.23E-22	0.00
	Ra-226+D	1.00	3.55E-07	5.96E-10	3.08E-08	9.10E-09	3.95E-07	0.20
	Th-230	1.00	1.91E-07	8.21E-10	1.62E-08	5.13E-09	2.13E-07	0.11
	U-234	1.00	3.97E-10	1.98E-11	3.98E-11	2.47E-11	4.82E-10	0.00
	U-235	1.00	6.40E-10	1.95E-11	1.69E-11	1.65E-11	6.93E-10	0.00
	U-238	1.00	2.09E-10	1.52E-11	7.88E-12	1.75E-11	2.49E-10	0.00
						Total:	**1.98E-06**	

† Assumed equilibrium

Adult Trespasser - Unit Total Effective Radiological Dose Rate (mrem/yr) - Year 0								
		Unit	Pathway-Specific Dose Prediction					
Source	Radionuclide	Concentration (pCi/g)	External	Inhalation	Meat	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	1.00	1.99E-02	3.86E-03	2.97E-05	1.86E-03	2.56E-02	0.14
	Pa-231†	1.00	2.27E-03	1.05E-03	5.25E-03	1.16E-03	9.72E-03	0.05
	Pb-210+D†	1.00	8.58E-05	7.03E-05	2.22E-03	3.02E-03	5.40E-03	0.03
	Ra-226+D	1.00	1.10E-01	6.92E-05	6.88E-04	5.01E-04	1.11E-01	0.59
	Th-230	1.00	3.62E-05	7.14E-04	2.63E-05	3.40E-04	1.12E-03	0.01
	U-234	1.00	3.96E-06	6.62E-05	2.12E-05	7.83E-05	1.70E-04	0.00
	U-235	1.00	7.78E-03	5.99E-05	2.05E-05	7.56E-05	7.94E-03	0.04
	U-238	1.00	1.67E-03	5.64E-05	2.09E-05	7.73E-05	1.82E-03	0.01
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	1.00	1.05E-03	7.92E-07	8.18E-06	3.82E-07	1.06E-03	0.01
	Pa-231†	1.00	1.13E-04	2.17E-07	4.90E-03	2.38E-07	5.02E-03	0.03
	Pb-210+D†	1.00	1.14E-06	1.40E-08	2.06E-03	6.00E-07	2.06E-03	0.01
	Ra-226+D	1.00	1.53E-02	1.39E-08	1.59E-03	1.03E-07	1.68E-02	0.09
	Th-230	1.00	3.40E-06	1.43E-07	3.21E-06	6.81E-08	6.82E-06	0.00
	U-234	1.00	2.04E-08	1.34E-08	5.74E-06	1.59E-08	5.79E-06	0.00
	U-235	1.00	2.23E-04	1.21E-08	5.59E-06	1.53E-08	2.28E-04	0.00
	U-238	1.00	1.37E-04	1.14E-08	5.67E-06	1.57E-08	1.43E-04	0.00
† Assumed equilibrium						**Total:**	**1.88E-01**	

Adult Trespasser - Unit Total Effective Radiological Dose Rate (mrem/yr) - Year 1,000								
		Unit	Pathway-Specific Dose Prediction					
Source	Radionuclide	Concentration (pCi/g)	External	Inhalation	Meat	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	1.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
	Pa-231†	1.00	2.64E-15	4.46E-16	8.71E-16	3.24E-16	4.28E-15	0.00
	Pb-210+D†	1.00	1.32E-18	6.70E-19	2.12E-17	2.87E-17	5.19E-17	0.00
	Ra-226+D	1.00	5.69E-02	5.20E-05	1.08E-03	1.31E-03	5.94E-02	0.46
	Th-230	1.00	2.65E-02	3.32E-04	5.02E-04	7.38E-04	2.81E-02	0.22
	U-234	1.00	8.08E-06	1.04E-07	1.53E-07	2.26E-07	8.56E-06	0.00
	U-235	1.00	2.08E-15	1.96E-17	2.21E-17	1.97E-17	2.14E-15	0.00
	U-238	1.00	7.74E-10	1.03E-11	1.47E-11	2.18E-11	8.21E-10	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	1.00	1.94E-20	9.19E-21	1.17E-22	4.43E-21	3.32E-20	0.00
	Pa-231†	1.00	1.37E-04	7.51E-05	2.92E-04	4.73E-05	5.51E-04	0.00
	Pb-210+D†	1.00	1.31E-19	8.27E-19	8.65E-17	3.55E-17	1.23E-16	0.00
	Ra-226+D	1.00	2.21E-02	3.63E-05	3.13E-03	9.19E-04	2.62E-02	0.20
	Th-230	1.00	1.17E-02	2.93E-04	1.63E-03	6.02E-04	1.42E-02	0.11
	U-234	1.00	2.44E-05	1.92E-06	3.98E-06	2.66E-06	3.29E-05	0.00
	U-235	1.00	4.14E-05	2.60E-06	6.82E-06	2.29E-06	5.31E-05	0.00
	U-238	1.00	1.46E-05	9.70E-07	6.01E-07	1.33E-06	1.75E-05	0.00
† Assumed equilibrium						**Total:**	**1.29E-01**	

Adult Trespasser Gross Incremental Lifetime Cancer Risk - Year 0								
		Gross EPC	Pathway-Specific Risk Estimate					
Source	Radionuclide	(pCi/g)	External	Inhalation	Meat	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.04	5.57E-09	1.39E-10	1.55E-12	9.70E-11	5.81E-09	0.00
	Pa-231†	0.04	2.85E-09	1.37E-10	2.80E-10	9.34E-11	3.37E-09	0.00
	Pb-210+D†	3.13	2.27E-09	2.74E-09	5.13E-08	6.96E-08	1.26E-07	0.02
	Ra-226+D	3.13	5.46E-06	4.33E-09	3.77E-08	3.78E-08	5.54E-06	0.71
	Th-230	2.66	2.05E-08	3.48E-09	3.29E-10	2.86E-09	2.72E-08	0.00
	U-234	0.89	4.01E-11	7.22E-10	1.52E-10	5.62E-10	1.48E-09	0.00
	U-235	0.04	3.79E-09	2.95E-11	7.10E-12	2.61E-11	3.85E-09	0.00
	U-238	0.92	1.72E-08	6.32E-10	1.98E-10	7.32E-10	1.87E-08	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.05	6.02E-10	1.02E-12	8.77E-13	7.07E-13	6.04E-10	0.00
	Pa-231†	0.05	2.90E-10	1.11E-12	4.25E-10	7.60E-13	7.16E-10	0.00
	Pb-210+D†	7.33	6.62E-11	2.33E-11	1.12E-07	5.90E-10	1.13E-07	0.01
	Ra-226+D	7.33	1.80E-06	4.34E-11	1.52E-07	4.24E-10	1.95E-06	0.25
	Th-230	7.96	8.50E-09	4.20E-11	7.30E-10	3.51E-11	9.31E-09	0.00
	U-234	1.24	4.44E-13	5.10E-12	7.36E-11	3.97E-12	8.31E-11	0.00
	U-235	0.05	1.77E-10	1.91E-13	3.22E-12	1.69E-13	1.81E-10	0.00
	U-238	1.22	2.38E-09	4.26E-12	9.15E-11	4.94E-12	2.48E-09	0.00
† Assumed equilibrium						**Total:**	**7.80E-06**	

Adult Trespasser Gross Incremental Lifetime Cancer Risk - Year 1,000								
		Gross EPC	Pathway-Specific Risk Estimate					
Source	Radionuclide	(pCi/g)	External	Inhalation	Meat	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
	Pa-231†	0.04	1.29E-21	3.25E-23	4.64E-23	2.22E-23	1.39E-21	0.00
	Pb-210+D†	3.13	3.49E-23	2.61E-23	4.88E-22	6.62E-22	1.21E-21	0.00
	Ra-226+D	3.13	2.83E-06	2.63E-09	3.31E-08	4.00E-08	2.91E-06	0.34
	Th-230	2.66	1.13E-06	2.52E-09	1.29E-08	1.66E-08	1.16E-06	0.13
	U-234	0.89	1.15E-10	2.62E-13	1.32E-12	1.70E-12	1.18E-10	0.00
	U-235	0.04	1.01E-21	5.67E-24	2.19E-24	4.88E-24	1.02E-21	0.00
	U-238	0.92	1.14E-14	2.64E-17	1.30E-16	1.68E-16	1.17E-14	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.05	1.12E-26	6.79E-28	1.25E-29	4.73E-28	1.23E-26	0.00
	Pa-231†	0.05	1.09E-10	8.44E-12	2.52E-11	5.81E-12	1.48E-10	0.00
	Pb-210+D†	7.33	7.53E-24	7.68E-23	4.73E-21	1.95E-21	6.76E-21	0.00
	Ra-226+D	7.33	2.60E-06	4.37E-09	2.26E-07	6.67E-08	2.90E-06	0.33
	Th-230	7.96	1.52E-06	6.53E-09	1.29E-07	4.08E-08	1.69E-06	0.20
	U-234	1.24	4.92E-10	2.44E-11	4.92E-11	3.05E-11	5.96E-10	0.00
	U-235	0.05	3.29E-11	1.00E-12	8.72E-13	8.52E-13	3.57E-11	0.00
	U-238	1.22	2.54E-10	1.85E-11	9.60E-12	2.13E-11	3.04E-10	0.00
† Assumed equilibrium						**Total:**	**8.66E-06**	

Adult Trespasser Gross Total Effective Radiological Dose Rate (mrem/yr) - Year 0								
		Gross EPC	Pathway-Specific Dose Prediction					
Source	Radionuclide	(pCi/g)	External	Inhalation	Meat	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.04	8.00E-04	1.56E-04	1.19E-06	7.50E-05	1.03E-03	0.00
	Pa-231†	0.04	9.13E-05	4.22E-05	2.11E-04	4.69E-05	3.92E-04	0.00
	Pb-210+D†	3.13	2.69E-04	2.20E-04	6.96E-03	9.44E-03	1.69E-02	0.03
	Ra-226+D	3.13	3.43E-01	2.17E-04	2.16E-03	1.57E-03	3.47E-01	0.68
	Th-230	2.66	9.60E-05	1.90E-03	6.97E-05	9.03E-04	2.97E-03	0.01
	U-234	0.89	3.52E-06	5.88E-05	1.88E-05	6.95E-05	1.51E-04	0.00
	U-235	0.04	3.14E-04	2.41E-06	8.25E-07	3.05E-06	3.20E-04	0.00
	U-238	0.92	1.53E-03	5.16E-05	1.91E-05	7.07E-05	1.67E-03	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.05	5.39E-05	4.08E-08	4.21E-07	1.97E-08	5.44E-05	0.00
	Pa-231†	0.05	5.84E-06	1.12E-08	2.53E-04	1.22E-08	2.58E-04	0.00
	Pb-210+D†	7.33	8.34E-06	1.03E-07	1.51E-02	4.40E-06	1.51E-02	0.03
	Ra-226+D	7.33	1.12E-01	1.02E-07	1.17E-02	7.58E-07	1.23E-01	0.24
	Th-230	7.96	2.70E-05	1.14E-06	2.55E-05	5.42E-07	5.42E-05	0.00
	U-234	1.24	2.53E-08	1.66E-08	7.10E-06	1.96E-08	7.16E-06	0.00
	U-235	0.05	1.15E-05	6.25E-10	2.88E-07	7.89E-10	1.18E-05	0.00
	U-238	1.22	1.67E-04	1.39E-08	6.90E-06	1.91E-08	1.74E-04	0.00
† Assumed equilibrium						**Total:**	**5.10E-01**	

Adult Trespasser Gross Total Effective Radiological Dose Rate (mrem/yr) - Year 1,000								
		Gross EPC	Pathway-Specific Dose Prediction					
Source	Radionuclide	(pCi/g)	External	Inhalation	Meat	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
	Pa-231†	0.04	1.06E-16	1.80E-17	3.51E-17	1.31E-17	1.73E-16	0.00
	Pb-210+D†	3.13	4.12E-18	2.10E-18	6.63E-17	9.00E-17	1.63E-16	0.00
	Ra-226+D	3.13	1.78E-01	1.63E-04	3.39E-03	4.10E-03	1.86E-01	0.33
	Th-230	2.66	7.04E-02	8.80E-04	1.33E-03	1.96E-03	7.45E-02	0.13
	U-234	0.89	7.17E-06	9.25E-08	1.36E-07	2.01E-07	7.60E-06	0.00
	U-235	0.04	8.36E-17	7.89E-19	8.90E-19	7.93E-19	8.61E-17	0.00
	U-238	0.92	7.08E-10	9.44E-12	1.34E-11	2.00E-11	7.51E-10	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.05	1.00E-21	4.73E-22	6.05E-24	2.28E-22	1.71E-21	0.00
	Pa-231†	0.05	7.07E-06	3.87E-06	1.50E-05	2.43E-06	2.84E-05	0.00
	Pb-210+D†	7.33	9.59E-19	6.06E-18	6.34E-16	2.60E-16	9.01E-16	0.00
	Ra-226+D	7.33	1.62E-01	2.66E-04	2.29E-02	6.73E-03	1.92E-01	0.34
	Th-230	7.96	9.33E-02	2.33E-03	1.30E-02	4.79E-03	1.13E-01	0.20
	U-234	1.24	3.01E-05	2.38E-06	4.92E-06	3.30E-06	4.07E-05	0.00
	U-235	0.05	2.13E-06	1.34E-07	3.51E-07	1.18E-07	2.74E-06	0.00
	U-238	1.22	1.78E-05	1.18E-06	7.31E-07	1.62E-06	2.14E-05	0.00
† Assumed equilibrium						**Total:**	**5.66E-01**	

Adult Trespasser Background Incremental Lifetime Cancer Risk - Year 0								
			Pathway-Specific Risk Estimate					
Source	Radionuclide	Mean Background (pCi/g)	External	Inhalation	Meat	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.05	6.43E-09	1.61E-10	1.78E-12	1.12E-10	6.71E-09	0.00
	Pa-231†	0.05	3.29E-09	1.58E-10	3.24E-10	1.08E-10	3.88E-09	0.00
	Pb-210+D†	0.74	5.39E-10	6.52E-10	1.22E-08	1.66E-08	3.00E-08	0.02
	Ra-226+D	0.74	1.30E-06	1.03E-09	8.96E-09	8.99E-09	1.32E-06	0.80
	Th-230	0.93	7.17E-09	1.21E-09	1.15E-10	9.99E-10	9.50E-09	0.01
	U-234	0.91	4.12E-11	7.42E-10	1.56E-10	5.78E-10	1.52E-09	0.00
	U-235	0.05	4.37E-09	3.40E-11	8.20E-12	3.01E-11	4.45E-09	0.00
	U-238	0.86	1.61E-08	5.94E-10	1.86E-10	6.88E-10	1.76E-08	0.01
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.04	4.26E-10	7.19E-13	6.20E-13	5.00E-13	4.27E-10	0.00
	Pa-231†	0.04	2.05E-10	7.86E-13	3.00E-10	5.37E-13	5.07E-10	0.00
	Pb-210+D†	0.87	7.83E-12	2.75E-12	1.33E-08	6.98E-11	1.34E-08	0.01
	Ra-226+D	0.87	2.13E-07	5.13E-12	1.79E-08	5.01E-11	2.31E-07	0.14
	Th-230	0.85	9.07E-10	4.48E-12	7.79E-11	3.74E-12	9.93E-10	0.00
	U-234	0.68	2.45E-13	2.81E-12	4.07E-11	2.19E-12	4.59E-11	0.00
	U-235	0.04	1.25E-10	1.35E-13	2.28E-12	1.20E-13	1.28E-10	0.00
	U-238	0.73	1.43E-09	2.56E-12	5.50E-11	2.97E-12	1.49E-09	0.00
† Assumed equilibrium						**Total:**	**1.64E-06**	

Adult Trespasser Background Incremental Lifetime Cancer Risk - Year 1,000								
			Pathway-Specific Risk Estimate					
Source	Radionuclide	Mean Background (pCi/g)	External	Inhalation	Meat	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
	Pa-231†	0.05	1.48E-21	3.75E-23	5.36E-23	2.57E-23	1.60E-21	0.00
	Pb-210+D†	0.74	8.29E-24	6.20E-24	1.16E-22	1.57E-22	2.88E-22	0.00
	Ra-226+D	0.74	6.73E-07	6.26E-10	7.88E-09	9.50E-09	6.91E-07	0.43
	Th-230	0.93	3.94E-07	8.80E-10	4.52E-09	5.81E-09	4.05E-07	0.25
	U-234	0.91	1.18E-10	2.69E-13	1.36E-12	1.75E-12	1.22E-10	0.00
	U-235	0.05	1.16E-21	6.54E-24	2.53E-24	5.63E-24	1.18E-21	0.00
	U-238	0.86	1.07E-14	2.48E-17	1.22E-16	1.58E-16	1.10E-14	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.04	7.91E-27	4.81E-28	8.84E-30	3.34E-28	8.73E-27	0.00
	Pa-231†	0.04	7.71E-11	5.97E-12	1.79E-11	4.11E-12	1.05E-10	0.00
	Pb-210+D†	0.87	8.91E-25	9.09E-24	5.59E-22	2.31E-22	8.00E-22	0.00
	Ra-226+D	0.87	3.08E-07	5.17E-10	2.67E-08	7.89E-09	3.43E-07	0.21
	Th-230	0.85	1.62E-07	6.97E-10	1.38E-08	4.35E-09	1.81E-07	0.11
	U-234	0.68	2.71E-10	1.35E-11	2.72E-11	1.68E-11	3.29E-10	0.00
	U-235	0.04	2.33E-11	7.09E-13	6.17E-13	6.03E-13	2.52E-11	0.00
	U-238	0.73	1.53E-10	1.11E-11	5.78E-12	1.28E-11	1.83E-10	0.00
† Assumed equilibrium						**Total:**	**1.62E-06**	

Adult Trespasser Background Total Effective Radiological Dose Rate (mrem/yr) - Year 0								
		Mean Background	Pathway-Specific Dose Prediction					
Source	Radionuclide	(pCi/g)	External	Inhalation	Meat	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.05	9.23E-04	1.79E-04	1.38E-06	8.65E-05	1.19E-03	0.01
	Pa-231†	0.05	1.05E-04	4.87E-05	2.44E-04	5.41E-05	4.52E-04	0.00
	Pb-210+D†	0.74	6.39E-05	5.23E-05	1.65E-03	2.25E-03	4.02E-03	0.04
	Ra-226+D	0.74	8.16E-02	5.15E-05	5.12E-04	3.73E-04	8.25E-02	0.76
	Th-230	0.93	3.35E-05	6.62E-04	2.44E-05	3.16E-04	1.04E-03	0.01
	U-234	0.91	3.61E-06	6.04E-05	1.93E-05	7.14E-05	1.55E-04	0.00
	U-235	0.05	3.62E-04	2.78E-06	9.52E-07	3.52E-06	3.69E-04	0.00
	U-238	0.86	1.44E-03	4.85E-05	1.80E-05	6.65E-05	1.57E-03	0.01
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.04	3.82E-05	2.88E-08	2.98E-07	1.39E-08	3.85E-05	0.00
	Pa-231†	0.04	4.13E-06	7.90E-09	1.79E-04	8.66E-09	1.83E-04	0.00
	Pb-210+D†	0.87	9.87E-07	1.21E-08	1.78E-03	5.21E-07	1.78E-03	0.02
	Ra-226+D	0.87	1.32E-02	1.21E-08	1.38E-03	8.97E-08	1.46E-02	0.14
	Th-230	0.85	2.89E-06	1.21E-07	2.72E-06	5.78E-08	5.79E-06	0.00
	U-234	0.68	1.39E-08	9.16E-09	3.92E-06	1.08E-08	3.95E-06	0.00
	U-235	0.04	8.11E-06	4.42E-10	2.04E-07	5.58E-10	8.32E-06	0.00
	U-238	0.73	1.00E-04	8.37E-09	4.15E-06	1.15E-08	1.04E-04	0.00
† Assumed equilibrium						**Total:**	**1.08E-01**	

Adult Trespasser Background Total Effective Radiological Dose Rate (mrem/yr) - Year 1,000								
		Mean Background	Pathway-Specific Dose Prediction					
Source	Radionuclide	(pCi/g)	External	Inhalation	Meat	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
	Pa-231†	0.05	1.23E-16	2.07E-17	4.05E-17	1.51E-17	1.99E-16	0.00
	Pb-210+D†	0.74	9.80E-19	4.98E-19	1.58E-17	2.14E-17	3.86E-17	0.00
	Ra-226+D	0.74	4.24E-02	3.87E-05	8.07E-04	9.75E-04	4.42E-02	0.42
	Th-230	0.93	2.46E-02	3.07E-04	4.66E-04	6.84E-04	2.60E-02	0.25
	U-234	0.91	7.37E-06	9.51E-08	1.40E-07	2.06E-07	7.81E-06	0.00
	U-235	0.05	9.65E-17	9.10E-19	1.03E-18	9.15E-19	9.93E-17	0.00
	U-238	0.86	6.66E-10	8.88E-12	1.26E-11	1.88E-11	7.06E-10	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.04	7.08E-22	3.35E-22	4.28E-24	1.61E-22	1.21E-21	0.00
	Pa-231†	0.04	5.00E-06	2.74E-06	1.06E-05	1.72E-06	2.01E-05	0.00
	Pb-210+D†	0.87	1.13E-19	7.17E-19	7.50E-17	3.08E-17	1.07E-16	0.00
	Ra-226+D	0.87	1.91E-02	3.14E-05	2.71E-03	7.96E-04	2.27E-02	0.22
	Th-230	0.85	9.95E-03	2.48E-04	1.39E-03	5.11E-04	1.21E-02	0.12
	U-234	0.68	1.66E-05	1.31E-06	2.72E-06	1.82E-06	2.25E-05	0.00
	U-235	0.04	1.51E-06	9.47E-08	2.48E-07	8.34E-08	1.94E-06	0.00
	U-238	0.73	1.07E-05	7.11E-07	4.40E-07	9.74E-07	1.28E-05	0.00
† Assumed equilibrium						**Total:**	**1.05E-01**	

Adult Trespasser Net Incremental Lifetime Cancer Risk - Year 0								
		Net EPC	Pathway-Specific Risk Estimate					
Source	Radionuclide	(pCi/g)	External	Inhalation	Meat	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.00	3.53E-10	8.82E-12	9.78E-14	6.14E-12	3.68E-10	0.00
	Pa-231†	0.00	1.81E-10	8.68E-12	1.77E-11	5.91E-12	2.13E-10	0.00
	Pb-210+D†	2.39	1.73E-09	2.09E-09	3.91E-08	5.31E-08	9.60E-08	0.02
	Ra-226+D	2.39	4.16E-06	3.30E-09	2.87E-08	2.88E-08	4.22E-06	0.68
	Th-230	1.73	1.34E-08	2.26E-09	2.14E-10	1.86E-09	1.77E-08	0.00
	U-234†	0.05	2.47E-12	4.45E-11	9.36E-12	3.47E-11	9.10E-11	0.00
	U-235‡	0.00	2.40E-10	1.87E-12	4.50E-13	1.65E-12	2.44E-10	0.00
	U-238	0.05	1.03E-09	3.78E-11	1.18E-11	4.38E-11	1.12E-09	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.02	1.76E-10	2.97E-13	2.56E-13	2.07E-13	1.77E-10	0.00
	Pa-231†	0.02	8.48E-11	3.25E-13	1.24E-10	2.22E-13	2.09E-10	0.00
	Pb-210+D†	6.46	5.84E-11	2.05E-11	9.91E-08	5.20E-10	9.97E-08	0.02
	Ra-226+D	6.46	1.59E-06	3.82E-11	1.34E-07	3.74E-10	1.72E-06	0.28
	Th-230	7.11	7.59E-09	3.75E-11	6.53E-10	3.13E-11	8.31E-09	0.00
	U-234	0.55	1.99E-13	2.28E-12	3.30E-11	1.78E-12	3.72E-11	0.00
	U-235	0.02	5.18E-11	5.59E-14	9.42E-13	4.95E-14	5.28E-11	0.00
	U-238	0.49	9.48E-10	1.70E-12	3.65E-11	1.97E-12	9.88E-10	0.00
						Total:	**6.17E-06**	

† Assumed equilibrium

‡ Assumed natural uranium ratio

Adult Trespasser Net Incremental Lifetime Cancer Risk - Year 1,000								
		Net EPC	Pathway-Specific Risk Estimate					
Source	Radionuclide	(pCi/g)	External	Inhalation	Meat	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
	Pa-231†	0.00	8.14E-23	2.06E-24	2.94E-24	1.41E-24	8.78E-23	0.00
	Pb-210+D†	2.39	2.66E-23	1.99E-23	3.72E-22	5.05E-22	9.23E-22	0.00
	Ra-226+D	2.39	2.16E-06	2.01E-09	2.52E-08	3.05E-08	2.22E-06	0.31
	Th-230	1.73	7.34E-07	1.64E-09	8.42E-09	1.08E-08	7.55E-07	0.11
	U-234†	0.05	7.09E-12	1.61E-14	8.13E-14	1.05E-13	7.30E-12	0.00
	U-235‡	0.00	6.39E-23	3.59E-25	1.39E-25	3.09E-25	6.47E-23	0.00
	U-238	0.05	6.80E-16	1.58E-18	7.79E-18	1.01E-17	7.00E-16	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.02	3.27E-27	1.99E-28	3.65E-30	1.38E-28	3.61E-27	0.00
	Pa-231†	0.02	3.19E-11	2.47E-12	7.38E-12	1.70E-12	4.34E-11	0.00
	Pb-210+D†	6.46	6.64E-24	6.77E-23	4.17E-21	1.72E-21	5.96E-21	0.00
	Ra-226+D	6.46	2.29E-06	3.85E-09	1.99E-07	5.88E-08	2.55E-06	0.36
	Th-230	7.11	1.35E-06	5.84E-09	1.15E-07	3.64E-08	1.51E-06	0.21
	U-234	0.55	2.20E-10	1.09E-11	2.20E-11	1.37E-11	2.67E-10	0.00
	U-235	0.02	9.64E-12	2.93E-13	2.55E-13	2.49E-13	1.04E-11	0.00
	U-238	0.49	1.01E-10	7.35E-12	3.83E-12	8.51E-12	1.21E-10	0.00
						Total:	**7.04E-06**	

† Assumed equilibrium

‡ Assumed natural uranium ratio

Adult Trespasser Net Total Effective Radiological Dose Rate (mrem/yr) - Year 0								
		Net EPC	Pathway-Specific Dose Prediction					
Source	Radionuclide	(pCi/g)	External	Inhalation	Meat	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.00	5.06E-05	9.84E-06	7.56E-08	4.75E-06	6.53E-05	0.00
	Pa-231†	0.00	5.78E-06	2.67E-06	1.34E-05	2.97E-06	2.48E-05	0.00
	Pb-210+D†	2.39	2.05E-04	1.68E-04	5.31E-03	7.20E-03	1.29E-02	0.03
	Ra-226+D	2.39	2.62E-01	1.65E-04	1.64E-03	1.20E-03	2.65E-01	0.66
	Th-230	1.73	6.25E-05	1.23E-03	4.54E-05	5.88E-04	1.93E-03	0.00
	U-234†	0.05	2.17E-07	3.62E-06	1.16E-06	4.28E-06	9.28E-06	0.00
	U-235‡	0.00	1.99E-05	1.53E-07	5.22E-08	1.93E-07	2.03E-05	0.00
	U-238	0.05	9.14E-05	3.09E-06	1.14E-06	4.23E-06	9.99E-05	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.02	1.58E-05	1.19E-08	1.23E-07	5.75E-09	1.59E-05	0.00
	Pa-231†	0.02	1.71E-06	3.26E-09	7.39E-05	3.58E-09	7.56E-05	0.00
	Pb-210+D†	6.46	7.35E-06	9.04E-08	1.33E-02	3.88E-06	1.33E-02	0.03
	Ra-226+D	6.46	9.86E-02	8.99E-08	1.03E-02	6.68E-07	1.09E-01	0.27
	Th-230	7.11	2.42E-05	1.02E-06	2.28E-05	4.84E-07	4.85E-05	0.00
	U-234	0.55	1.13E-08	7.43E-09	3.18E-06	8.78E-09	3.21E-06	0.00
	U-235	0.02	3.35E-06	1.83E-10	8.42E-08	2.31E-10	3.44E-06	0.00
	U-238	0.49	6.65E-05	5.54E-09	2.75E-06	7.60E-09	6.92E-05	0.00
						Total:	**4.02E-01**	

† Assumed equilibrium

‡ Assumed natural uranium ratio

Adult Trespasser Net Total Effective Radiological Dose Rate (mrem/yr) - Year 1,000								
		Net EPC	Pathway-Specific Dose Prediction					
Source	Radionuclide	(pCi/g)	External	Inhalation	Meat	Soil	Total	Fraction
Surface Soil (0 to 0.15 m bgs) (0 to 0.5 ft bgs)	Ac-227†	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
	Pa-231†	0.00	6.74E-18	1.14E-18	2.22E-18	8.26E-19	1.09E-17	0.00
	Pb-210+D†	2.39	3.14E-18	1.60E-18	5.05E-17	6.86E-17	1.24E-16	0.00
	Ra-226+D	2.39	1.36E-01	1.24E-04	2.59E-03	3.12E-03	1.42E-01	0.31
	Th-230	1.73	4.58E-02	5.73E-04	8.68E-04	1.27E-03	4.85E-02	0.11
	U-234†	0.05	4.42E-07	5.70E-09	8.38E-09	1.24E-08	4.68E-07	0.00
	U-235‡	0.00	5.29E-18	4.99E-20	5.63E-20	5.02E-20	5.45E-18	0.00
	U-238	0.05	4.24E-11	5.65E-13	8.03E-13	1.19E-12	4.49E-11	0.00
Subsurface Soil (0.15 to 1.52 m bgs) (0.5 to 5 ft bgs)	Ac-227†	0.02	2.93E-22	1.38E-22	1.77E-24	6.67E-23	5.00E-22	0.00
	Pa-231†	0.02	2.07E-06	1.13E-06	4.39E-06	7.12E-07	8.30E-06	0.00
	Pb-210+D†	6.46	8.45E-19	5.34E-18	5.59E-16	2.29E-16	7.95E-16	0.00
	Ra-226+D	6.46	1.43E-01	2.34E-04	2.02E-02	5.94E-03	1.69E-01	0.37
	Th-230	7.11	8.33E-02	2.08E-03	1.16E-02	4.28E-03	1.01E-01	0.22
	U-234	0.55	1.35E-05	1.07E-06	2.20E-06	1.48E-06	1.82E-05	0.00
	U-235	0.02	6.24E-07	3.91E-08	1.03E-07	3.45E-08	8.00E-07	0.00
	U-238	0.49	7.10E-06	4.71E-07	2.92E-07	6.45E-07	8.51E-06	0.00
						Total:	**4.61E-01**	

† Assumed equilibrium

‡ Assumed natural uranium ratio

Table 6-14. Summary of estimated incremental lifetime cancer risk (ILCR) and predicted effective radiological dose rates (mrem/yr) for all receptors for present (year 0) and modeled future (year 1,000) conditions. Risk and dose for construction workers are the sum of exposure to site soils (surface and subsurface), groundwater, and surface water; risk and dose for all other receptors is for exposure to soils only. Risk for trespassers is the sum of those calculated for adolescent and adult trespassers individually, in order to incorporate the full course of potential exposure. See tables 6-9 through 6-13 for detailed results for each receptor.

Gross Incremental Lifetme Cancer Risk and Annual Total Effective Dose Equivalent				
	Year 0		Year 1,000	
Receptor	ILCR (unitless)	Dose Rate (mrem/yr)	ILCR (unitless)	Dose Rate (mrem/yr)
Industrial Worker	6E-05	2.9	6E-05	3.2
Maintenance Worker	2E-05	0.9	2E-05	1.0
Construction Worker	1E-05	18	1E-05	19
Trespasser[1]	1E-05	4.4	2E-05	4.9

[1] Trespasser results are the total of adolescent and adult results for ILCR, and the maximum of individual adolescent and adult results for annual dose rate.

Background Incremental Lifetme Cancer Risk and Annual Total Effective Dose Equivalent				
	Year 0		Year 1,000	
Receptor	ILCR (unitless)	Dose Rate (mrem/yr)	ILCR (unitless)	Dose Rate (mrem/yr)
Industrial Worker	1E-05	0.6	1E-05	0.6
Maintenance Worker	4E-06	0.2	4E-06	0.2
Construction Worker	2E-06	2.4	2E-06	2.2
Trespasser[1]	3E-06	0.7	3E-06	0.7

[1] Trespasser results are the total of adolescent and adult results for ILCR, and the maximum of individual adolescent and adult results for annual dose rate.

Net Site Incremental Lifetme Cancer Risk and Annual Total Effective Dose Equivalent				
	Year 0		Year 1,000	
Receptor	ILCR (unitless)	Dose Rate (mrem/yr)	ILCR (unitless)	Dose Rate (mrem/yr)
Industrial Worker	4E-05	2.2	5E-05	2.6
Maintenance Worker	1E-05	0.7	2E-05	0.8
Construction Worker	1E-05	16	1E-05	16
Trespasser[1]	1E-05	3.7	1E-05	4.2

[1] Trespasser results are the total of adolescent and adult results for ILCR, and the maximum of individual adolescent and adult results for annual dose rate.

Table 6-15. Ecological screening of site radionuclides in soils. Ratios shown are the maximum concentration for a radionuclide divided by the biota concentration guideline (BCG) for the given system (terrestrial or aquatic). Surface soil was used as a surrogate for sediment for evaluating potential aquatic receptors because it would serve as the sediment substrate for any organisms residing in the ponded surface water on site. Upper confidence limits on the mean (UCL_{95}) and upper tolerance limits (UTL_{95-95}) are as calculated for the human health risk assessment (Tables 6-2 and 6-7).

			Site Soil Concentrations (pCi/g)				Biota Concentration Guidelines (pCi/g)		Ratios	
Radionuclide	Detections	Sample Size	Arithmetic Mean	UCL_{95} on the mean	UTL_{95-95}	Maximum	Terrestrial (soil)[1]	Aquatic (sediment)[2]	Terrestrial (soil)	Aquatic (sediment)
Surface Soil (0 to 0.5 ft bgs)										
Radium-226	89	89	1.70	3.13	8.75	22.64	50	100	0.45	0.23
Thorium-230	89	89	1.33	2.66	4.10	26.88	N/A	N/A	--	--
Uranium-234	88	88	0.81	0.89	1.76	3.79	5,000	5,000	0.00	0.00
Uranium-235	25	88	0.03	0.04	0.09	0.11	3,000	4,000	0.00	0.00
Uranium-238	88	88	0.83	0.92	1.70	4.05	2,000	2,000	0.00	0.00
								Sum of Ratios[3]	**0.46**	**0.23**
Subsurface Soil (0.5 to 5 ft bgs)										
Radium-226	178	178	2.83	7.33	6.09	155.20	50	--	3.10	--
Thorium-230	175	177	2.34	7.96	2.10	228.70	N/A	--	--	--
Uranium-234	178	178	1.13	1.24	2.37	8.25	5,000	--	0.00	--
Uranium-235	81	178	0.04	0.05	0.10	0.29	3,000	--	0.00	--
Uranium-238	178	178	1.12	1.22	2.13	8.02	2,000	--	0.00	--
								Sum of Ratios[4]	**3.11**	**--**
								Sum of Ratios (surface + subsurface)[5]	**3.57**	**--**

[1] The limiting receptors for all terrestrial soil BCGs shown are terrestrial animals.

[2] The limiting receptors for all aquatic sediment BCGs shown are riparian animals. Sediment evaluation was applied only to surface soils, due to its potential to serve as a sediment substrate for ponded surface water on site.

[3] These sums of ratios include that ratios calculated for each radionuclide in surface soil for the given system (terrestrial or aquatic).

[4] This sum of ratios includes the ratios calculated for each radionuclide in subsurface soil.

[5] This sum of ratios includes the ratios calculated for each radionuclide in surface soil and subsurface soil.

Table 6-16. Ecological screening of chemical constituents (total uranium) in surface soil. Screening for surface water was not required because it was determined that uranium in surface water did not exceed background concentrations (Table 6-3). Surface soil was used as a surrogate for sediment for evaluating potential aquatic receptors because it would serve as the sediment substrate for organisms residing in the ponded surface water on site.

			Maximum Concentrations		Total Uranium Screening Levels[2]		
Contaminant	Half-Life (years)	Specific Activity (pCi/g)	Surface Soil	Units	Soil	Sediment[3]	Units
Uranium-234	2.46E+05	6.22E+09	3.79	pCi/g	--	--	--
Uranium-235	7.00E+08	2.17E+06	0.11	pCi/g	--	--	--
Uranium-238	4.50E+09	3.34E+05	4.05	pCi/g	--	--	--
Total Uranium[1]	--	--	12.19	mg/kg	25	100	mg/kg

[1] The concentration for total uranium was derived as the sum of the ratios of individual uranium isotope concentrations and specific activities. Using the maximum concentrations resulted in a U-234:U-238 activity ratio of 0.94.

[2] LANL ECORISK database (v. 4.1) based on a geometric mean lowest observed effect concentrations adjusted downward by an uncertainty factor of 10 to a predicted no effect concentration.

[3] The screening level for sediment was used as a surrogate for the potential that site surface soil would serve as sediment substrate for aquatic organisms inhabiting ponded water on site.

APPENDIX A
BORING LOGS

HTW DRILLING LOG

HOLE NO. **C1S1-01**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-6-18** / 11. DATE COMPLETED: **12-6-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0.0-0.2') Dark brown SILT and CLAY, some Organics (grass, roots), wet to moist, soft (0.2-0.5') Brown SILT, some Clay, little Slag, blue grey, coars Gravel in size [no elevated Rad readings]	(0-0.5') 0 ppm	NA	(0-0.5')	1134 / 3 / 302 counts per minute
	1.0	(0.5-1.3') Grey CLAY and SILT, low plasticity, moist, medium dense (1.3-2.5') Brown SILT and CLAY, some Gravel, moist, medium dense to dense, nonplastic	(0.5-1.5') 0 ppm		(0.5-1.5')	1043 / 2 / 296 counts per minute
	2.0		(1.5-2.5') 0 ppm		(1.5-2.5')	1016 / 0 / 289 counts per minute
		(2.5-2.6') Dark brown SILT and fine Sand, little Organics, moist, soft	(2.5-5') 0 ppm			979 / 0 / 290 counts per minute
	3.0	(2.6-5') Red brown TILL, medium dense to dense, moist to dry				
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S1-02**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**	SHEET 1 OF 1 SHEETS
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**	
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: **12-6-18**	11. DATE COMPLETED: **12-6-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**	
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**	
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**	

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.1') Dark brown SILT and organics (grass, roots) (0.1-1.0') Dark brown CLAY, high plasticity, moist stiff	(0-0.5') 0 ppm	NA	(0-0.5')	1264 / 0 / 306 counts per minute
			(0.5-1.5') 0 ppm		(0.5-1.5')	1175 / 1 / 348 counts per minute
	1.0	(1.0-1.8') Brown SILT and Clay, some fine Sand, little Organics, little coarse Gravel (Fill), moist (ununiform)				
			(1.5-5') 0 ppm		(1.5-2.5')	1359 / 2 / 296 counts per minute
	2.0	(1.8-5') Red brown TILL, Silt and Clay, medium-coarse Gravel, very dense, moist				
	3.0					
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S1-03**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-6-18** / 11. DATE COMPLETED: **12-6-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.8') Dark brown SILT and CLAY, some Organics, medium dense, moist (Fill)	(0-0.5') 0 ppm	NA	(0-0.5')	1011 / 0 / 67 counts per minute
	1.0	(0.8-2') Brown CLAY and SILT, little fine Gravel, moist, medium dense, low plasticity (Fill)	(0.5-1.5') 0 ppm		(0.5'-1.5')	959 / 0 / 121 counts per minute
			(1.5-2.5') 0 ppm		(1.5'-2.5')	1078 / 0 / 113 counts per minute
	2.0	(2-2.2') SLAG, blue-grey, porous, coarse Gravel, dry dense (2.2-2.6') Red brown fine SAND and SILT, moist nonplastic, soft to medium dense				
	3.0	(2.6-5') TILL, red brown Silt and Clay, some coarse Gravel, angular, moist to dry	(2.5-5') 0 ppm			
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S1-04**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
SHEET 1 OF 1 SHEETS	
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-5-18** / 11. DATE COMPLETED: **12-5-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90** %

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-1.3') Dark brown SILT and fine SAND, some coarse Gravel, angular, little Organics, moist, medium dense, nonplastic	(0-0.5') 0 ppm	NA	(0-0.5')	1978 / 1 / 155 counts per minute
			(.5-1.5') 0 ppm		(0.5-1.5')	904 / 1 / 122 counts per minute
	1.0	(1.3-1.9') Dark brown SILT, some Clay, little Organics (roots), low plasticity, moist, soft	(1.5-5') 0 ppm		(1.5-2.5')	1060 / 0 / 183 counts per minute
	2.0	(1.9-2.2') Light brown CLAY and SLIT, high plasticity, moist, stiff				
		(2.2-5') Light brown to red brown TILL, Silt and Clay with fine-coarse, Gravel, rounded to angular, very dense, moist to dry				
	3.0					
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S1-05**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-6-18** / 11. DATE COMPLETED: **12-6-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0.0-0.2') Brown SILT and CLAY, wet to moist, soft Organics (grass, roots) (0.2-2.3') Dark brown FILL – Silt and Clay, little Organics, medium dense, moist, trace medium Gravel, angular	(0-0.5') 0 ppm	NA	(0-0.5')	1045 / 2 / 300 counts per minute
	1.0		(0.5-1.5') 0 ppm		(0.5-1.5')	1170 / 1 / 287 counts per minute
	2.0		(1.5-2.5') 0 ppm		(1.5-2.5')	2056 / 6 / 355 counts per minute
		(2.3-3.1') Blue/green SLAG, white and black, porous and vitreous (glass like) medium-coarse Gravel in size, dry, dense [elevated Rad levels]	(2.5-5') 0 ppm			1160 / 1 / 283 counts per minute
	3.0	(3.1-5') Brown SILT and CLAY, little fine Gravel, angular, Fill – not uniform, voids in Silt and Clay				
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S1-06**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**	SHEET 1 OF 1 SHEETS
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**	
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: **12-10-18**	11. DATE COMPLETED: **12-10-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**	
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**	
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**	

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.3') Dark brown SILT and Organics, wet, soft, some coarse Gravel (0.3-1.7') Red brown to brown SILT and CLAY, some Organics, little medium-coarse Gravel, moist dense	(0-0.5') 0 ppm	NA	NA	1040 / 0 / 67 counts per minute
	1.0		(0.5-1.5') 0 ppm			1178 / 0 / 138 counts per minute
	2.0	(1.7-2.4') Dark brown SILT and SLAG, coarse Gravel, angular, porous, moist, grey, blue, black (Fill), Fill not uniform (2.4-3') TILL, SILT and CLAY, dry, dense, little coarse Gravel	(1.5-2.5') 0 ppm			1962 / 0 / 161 counts per minute
	3.0	(3-5') TILL – red brown SILT and Clay, some medium-coarse Gravel, moist, dense	(2.5-5') 0 ppm			
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S1-07**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-5-18** / 11. DATE COMPLETED: **12-5-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **4 ft bgs**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90** %

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.4') Brown coarse GRAVEL and Organics (grass, roots), angular, loose, moist to wet	(0-0.5') 0 ppm	NA	(0-0.5')	1040 / 2 / 125 counts per minute
		(0.4-1.4') Red brown SILT and CLAY, some fine Gravel, medium plasticity, no dilatancy, moist, medium stiff (Slag, fine Gravel), Fill (0.5' bgs)	(.5-1.5') 0 ppm		(0.5-1.5')	1075 / 0 / 156 counts per minute
	1.0					
		(1.4-2.1') Brown fine SAND and SILT, some Clay, little fine Gravel, medium stiff, moist	(1.5-5') 0 ppm		(1.5-2.5')	1048/ 0 / 46 counts per minute
	2.0					
		(2.1-3.8') Red brown fine SAND and SILT, wet, slow dilatancy, soft				
	3.0					
	4.0	(3.8-5') Red brown TILL, very dense, moist to dry, trace Organics				
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S1-08**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**	SHEET 1 OF 1 SHEETS
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**	
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: **12-5-18**	11. DATE COMPLETED: **12-5-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **2.7 ft bgs**	
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**	
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**	

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.4') Brown coarse GRAVEL and Organics (grass, roots, leaves), angular, medium-dense, wet	(0-0.5') 0 ppm	NA	(0-0.5')	1111 / 0 / 124 counts per minute
		(0.4-1.3') Brown TILL, SILT and CLAY, some coarse Gravel, angular, dense, moist	(.5-1.5') 0 ppm		(0.5-1.5')	1052 / 3 / 135 counts per minute
	1.0					
		(1.3-2.8') Light brown SILT and fine SAND, low dilatancy, medium dense, moist, trace Organics	(1.5-5') 0 ppm		(1.5-2.5')	1154 / 4 / 134 counts per minute
	2.0					
		(2.8-5') Light brown fine SAND, some Silt, set, rapid dilatancy, nonplastic, medium dense				
	3.0					
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S1-09**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**	SHEET 1 OF 1 SHEETS
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**	
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: **12-5-18**	11. DATE COMPLETED: **12-5-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**	
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**	
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**	

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.2') Dark brown fine SAND, little Silt, some Organics (grass roots)	(0-0.5') 0 ppm	NA	(0-0.5')	1227 / 2 / 222 counts per minute
		(0.2-0.5') Grey crushed STONE, coarse Gravel, wet, dense				
		(0.5-1.5') Red brown CLAY and SILT, some medium Gravel, moist, dense (Fill) ununiform	(0.5-1.5') 0 ppm		(0.5-1.5')	1155 / 3 / 309 counts per minute
	1.0					
			(1.5-5') 0 ppm		(1.5-2.5')	1178 / 0 / 269 counts per minute
		(1.5-5') Red brown TILL, Clay and Silt, some fine-coarse Gravel, moist to dry, dense				
	2.0					
	3.0					
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S1-10**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
SHEET 1 OF 1 SHEETS	
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-10-18** — 11. DATE COMPLETED: **12-10-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-1.2') Dark brown SLAG and SILT, some Organics, little medium-coarse Gravel, wet, medium dense (Fill)	(0-0.5') 0 ppm	NA	(0-0.5')	1112 / 0 / 38 counts per minute
	1.0	(1.2-4.6') Red brown TILL, Silt and Clay, some medium -coarse Gravel, angular to subangular, moist dense	(0.5-1.5') 0 ppm		(0.5-1.5')	1118 / 0 / 98 counts per minute
	2.0		(1.5-2.5') 0 ppm		(1.5-2.5')	1185 / 0 / 136 counts per minute
	3.0		(2.5-5') 0 ppm			
	4.0					
	5.0	(4.6-5') Red brown fine SAND, some Silt, moist, medium dense EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S1-11**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**	SHEET 1 OF 1 SHEETS
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**	
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: **12-5-18**	11. DATE COMPLETED: **12-5-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**	
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**	
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**	

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90** %

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0 1.0 2.0 3.0 4.0 5.0 6.0	(0-0.2') Dark brown SILT and CLAY, some coarse to medium Gravel, subrounded, little Organics, wet to moist, medium dense (0.2-2.1') Brown SILT and CLAY, some medium Gravel, subrounded medium dense, wet (Fill) (2.1-2.2') Dark brown SILT, some fine Sand, little Organics, moist, soft, nonplastic (2.2-5') Red brown TILL, Silt and Clay with medium-coarse Gravel, angular to rounded, very dense, moist to dry EOB at 5'	(0-0.5') 0 ppm (0.5-1.5') 0 ppm (1.5-5') 0 ppm	NA	(0-0.5') (0.5-1.5') (1.5-2.5')	971 / 2 / 265 counts per minute 1141 / 2 / 295 counts per minute 1036 / 2 / 303 counts per minute

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

HTW DRILLING LOG

HOLE NO. **C1S1-12**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
SHEET 1 OF 1 SHEETS	
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-10-18** — 11. DATE COMPLETED: **12-10-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **4.6 ft bgs**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-1') Dark brown coarse GRAVEL, some medium-coarse Gravel, little Organics (slag), wet, dense (Fill)	(0-0.5') 0 ppm	NA	(0-0.5')	891 / 0 / 42 counts per minute
	1.0	(1-1.8') Brown SILT and CLAY, some medium-coarse Gravel, little Organics (roots), moist, medium dense, nonplastic	(0.5-1.5') 0 ppm		(0.5-1.5')	1166 / 0 / 125 counts per minute
	2.0	(1.8-3.3') Red brown SILT and CLAY (TILL), some fine-medium Gravel, moist, medium dense	(1.5-2.5') 0 ppm		(1.5-2.5')	1114 / 0 / 132 counts per minute
	3.0	(3.3-3.8') Red brown fine SAND and SILT, wet, medium dense, slow dilatancy	(2.5-5') 0 ppm			
	4.0	(3.8-5') TILL, SILT and CLAY, some medium Gravel, moist, dense, red brown				
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

HTW DRILLING LOG

HOLE NO. **C1S1-13**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
SHEET 1 OF 1 SHEETS	
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-5-18** — 11. DATE COMPLETED: **12-5-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.3') Dark brown SILT and CLAY, some coarse Gravel, angular, wet to moist, little Organics, soft to medium dense (Fill)	(0-0.5') 0 ppm	NA	(0-0.5')	981 / 2 / 259 counts per minute
		(0.3-2.6') Brown SILT and CLAY, little Organics, trace fine Gravel, moist, medium dense	(0.5-1.5') 0 ppm		(0.5-1.5')	1291 / 2 / 283 counts per minute
	1.0					
			(1.5-5') 0 ppm		(1.5-2.5')	1192 / 2 / 265 counts per minute
	2.0					
		(2.6-3') Dark brown SILT, some fine Sand, little Organics, moist to dry, soft, nonplastic				
	3.0	(3-5') Red brown TILL, Silt and Clay, coarse Gravel, angular, moist to dry				
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S1-14**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-12-18** / 11. DATE COMPLETED: **12-12-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90** %

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.2') Dark brown SILT and SAND, some Organics, moist, soft (0.2-2') Grey, crushed stone, fine-coarse SAND and Gravel in size, dry, dense (Fill)	(0-0.5') 0 ppm	NA	(0-0.5')	917 / 0 / 52 counts per minute
	1.0		(0.5-1.5') 0 ppm		(0.5-1.5')	803 / 0 / 20 counts per minute
	2.0	(2-5') Red brown TILL moist to dry, dense to very dense	(1.5-2.5') 0 ppm		(1.5-2.5')	1023 / 0 / 98 counts per minute
	3.0		(2.5-5') 0 ppm			
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S2-01**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
SHEET 1 OF 1 SHEETS	
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-6-18** — 11. DATE COMPLETED: **12-6-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-1.5') Brown SILT and CLAY, some Organics, little medium-coarse Gravel, moist, soft to medium dense, low plasticity (Fill)	(0-0.5') 0 ppm	NA	(0-0.5')	1057 / 0 / 71 counts per minute
	1.0		(0.5-1.5') 0 ppm		(0.5-1.5')	1109 / 0 / 96 counts per minute
		(1.5-2.2') Dark brown fine SAND and SILT, some Organics (roots, twigs) moist, nonplastic	(1.5-2.5') 0 ppm		(1.5-2.5')	1051 / 2 / 99 counts per minute
	2.0	(2.2-5') TILL dark brown to red brown Silt and Clay, some medium-coarse Gravel, angular, dense to very dense, moist				
			(2.5-5') 0 ppm			
	3.0					
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

HTW DRILLING LOG

HOLE NO. **C1S2-02**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
SHEET 1 OF 1 SHEETS	
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-6-18** — 11. DATE COMPLETED: **12-6-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.2') Dark brown SILT and CLAY, some Organics, wet to moist, medium dense, nonplastic, Fill (0.2-5') Dark brown SILT and CLAY, some coarse Gravel, angular, moist, medium dense, Fill, low plasticity [elevated Rad at 3']	(0-0.5') 0 ppm	NA	(0-0.5')	950 / 2 / 107 counts per minute
	1.0		(0.5-1.5') 0 ppm		(0.5-1.5')	960 / 0 / 99 counts per minute
	2.0		(1.5-2.5') 0 ppm			1000 / 3 / 141 counts per minute
	3.0					
	4.0		(4-5') 0 ppm		(4-5')	1130 / 2 / 134 counts per minute
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

HTW DRILLING LOG

HOLE NO. **C1S2-03**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-18-18** / 11. DATE COMPLETED: **12-18-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **2.2 ft bgs**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.7') Brown CLAY and Organics, wet, soft, high plasticity	(0-0.5') 0 ppm	NA	(0-0.5')	1009 / 0 / 39 counts per minute
	1.0	(0.7-2.2') Brown and red brown SILT and CLAY, some medium-coarse Gravel and Slag, wet soft to medium dense, little Organics (Fill)	(0.5-1.5') 0 ppm		(0.5-1.5')	1130 / 0 / 40 counts per minute
	2.0		(1.5-2.5') 0 ppm		(1.5-2.5')	1100 / 0 / 72 counts per minute
		(2.2') Possible top of former soil horizon – Organics at interface				
	3.0	(2.2-5') Red brown TILL, SILT and CLAY, some fine-coarse Gravel, angular, moist to dry	(2.5-5') 0 ppm			
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S2-04**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-18-18** — 11. DATE COMPLETED: **12-18-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.9') Brown CLAY wet, soft, high plasticity, Organics on surface	(0-0.5') 0 ppm	NA	(0-0.5')	1062 / 1 / 92 counts per minute
	1.0	(0.9') Black, synthetic textile (0.9-1') Red brown TILL, CLAY, and SILT, some medium-coarse Gravel, Organics at 0.9', possible former surface soil horizon	(0.5-1.5') 0 ppm		(0.5-1.5')	1175 / 0 / 66 counts per minute
	2.0	(1-5') Red brown TILL, SILT and CLAY, some medium-coarse Gravel, rounded, angular, moist to dry, dense to very dense at 5'	(1.5-2.5') 0 ppm		(1.5-2.5')	1127 / 3 / 54 counts per minute
	3.0		(2.5-5') 0 ppm			
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

HTW DRILLING LOG

HOLE NO. **C1S2-05**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
SHEET 1 OF 1 SHEETS	
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-6-18** — 11. DATE COMPLETED: **12-6-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-1.7') Dark brown SILT and CLAY, some medium-coarse Gravel, angular, moist, medium dense (Fill)	(0-0.5') 0 ppm	NA	(0-0.5')	1255 / 3 / 325 counts per minute
	1.0		(0.5-1.5') 0 ppm		(0.5-1.5')	1660 / 3 / 307 counts per minute
		(1.7-1.9') Grey coarse GRAVEL, dense, angular, poorly-sorted, (crushed stone fill)	(1.5-2.5') 0 ppm		(1.5-2.5')	1340 / 6 / 331 counts per minute
	2.0	(1.9-2.5') Dark brown SILT and CLAY, some medium Gravel, medium dense, moist, low plasticity, trace Organics				
		(2.5-5') Red brown TILL, SILT, and CLAY, some medium-coarse Gravel, moist to dry, very dense	(2.5-5') 0 ppm			1209 / 3 / 313
	3.0					
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S2-06**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**	SHEET 1 OF 1 SHEETS
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**	
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: **12-18-18**	11. DATE COMPLETED: **12-18-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**	
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**	
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**	

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.1') Brown CLAY, little Organics, moist, high plasticity, medium dense, (Fill)	(0-0.5') 0 ppm	NA	(0-0.5')	1130 / 1 / 77 counts per minute
	1.0	(1-1.4') Brown SILT and SLAG, some coarse Gravel/Slag, little Organics, possible former surface top soil, Organics (grass) at 1.4', moist soft	(0.5-1.5') 0 ppm		(0.5-1.5')	1210 / 4 / 74 counts per minute
	2.0	(1.4-5') Red brown TILL, SILT and CLAY, some medium-coarse Gravel, angular, moist to dry with depth, dense to very dense with depth	(1.5-2.5') 0 ppm		(1.5-2.5')	1145 / 0 / 39 counts per minute
	3.0		(2.5-5') 0 ppm			
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S2-07**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street** 9. SURFACE ELEVATION:
	10. DATE STARTED: **12-18-18** — 11. DATE COMPLETED: **12-18-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **0.5 ft bgs**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.5') Black synthetic textile (woven)	(0-0.5') 0 ppm	NA	(0-0.5')	1089 / 0 / 34 counts per minute
		(0.5-1.4') Brown SILT and coarse GRAVEL, some Clay, wet, dense, trace Organics	(0.5-1.5') 0 ppm		(0.5-1.5')	1166 / 0 / 66 counts per minute
	1.0					
		(1.4-1.8') Brown SILT and CLAY, some medium-coarse Gravel, angular, rounded, moist, dense, Organics at 1.4' (possible former top soil horizon)	(1.5-2.5') 0 ppm		(1.5-2.5')	1112 / 1 / 56 counts per minute
	2.0	(1.8-5') Red brown TILL, very dense, moist to dry, Silt and Clay, some medium-coarse Gravel, angular, low plasticity				
			(2.5-5') 0 ppm			
	3.0					
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

HTW DRILLING LOG

HOLE NO. **C1S2-08**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **1-23-19** — 11. DATE COMPLETED: **1-23-19**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **4.8 ft bgs**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.4') Dark brown ORGANICS, little Silt, soft wet (frozen)	(0-0.5') 0 ppm	NA	(0-0.5')	1191 / 2 / 68 counts per minute
		(0.4-1.0') Red brown SILT and CLAY, some course Gravel, moist dense, medium plasticity, little Organics (fill)				
	1.0	(1.0-2.7') Red brown TILL, SILT, and CLAY, some medium-coarse Gravel, little Organics, moist dense	(0.5-1.5') 0 ppm		(0.5-1.5')	1429 / 2 / 78 counts per minute
	2.0		(1.5-2.5') 0 ppm		(1.5-2.5')	1297 / 0 / 120 counts per minute
		(2.7') Possible top of former surface soil horizon	(2.5-5') 0 ppm			
	3.0	(2.7-5') Red brown TILL, CLAY, little Silt, some medium-coarse Gravel, angular, moist, very dense				
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S2-09**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**	SHEET 1 OF 1 SHEETS
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**	
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: **12-18-18**	11. DATE COMPLETED: **12-18-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**	
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**	
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**	

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.7') Brown SILT and CLAY, fine Sand, some Organics, wet, soft	(0-0.5') 0 ppm	NA	(0-0.5')	1081 / 0 / 61 counts per minute
	1.0	(0.7') Black synthetic textile (woven) (0.7-0.9') Red brown CLAY and SILT, some Organics, soft, wet (0.9-5') Red brown TILL, CLAY, and SILT, some medium-coarse, Gravel, rounded, to angular, moist to dry with depth, dense to very dense with depth	(0.5-1.5') 0 ppm		(0.5-1.5')	1218 / 0 / 51 counts per minute
	2.0		(1.5-2.5') 0 ppm		(1.5-2.5')	1021 / 3 / 90 counts per minute
	3.0		(2.5-5') 0 ppm			
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S2-10**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**	SHEET 1 OF 1 SHEETS
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**	
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: **12-13-18**	11. DATE COMPLETED: **12-13-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**	
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**	
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**	

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.5') Dark brown CLAY, high plasticity, wet, soft (Fill)	(0-0.5') 0 ppm	NA	(0-0.5')	1089 / 0 / 129 counts per minute
		(0.5') Black synthetic textile at interface, some Organics				
		(0.5-1,1') Grey, medium-coarse GRAVEL, some Silt, wet, dense, (Fill)	(0.5-1.5') 0 ppm		(0.5-1.5')	1166 / 0 / 130 counts per minute
	1.0	(1.1-1.6') TILL, dark brown, Silt and Clay, wet to moist trace Organics				
		(1.6-5') TILL, red brown, Silt and Clay, some medium-coarse Gravel, moist to dry, dense to very dense	(1.5-2.5') 0 ppm		(1.5-2.5')	1266 / 0 / 117 counts per minute
	2.0					
			(2.5-5') 0 ppm			
	3.0					
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S2-11**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**	SHEET 1 OF 1 SHEETS
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**	
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: **1-23-19**	11. DATE COMPLETED: **1-23-19**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**	
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**	
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**	

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.2') Dark brown ORGANICS, some Clay, wet, very soft, high plasticity	(0-0.5') 0 ppm	NA	(0-0.5')	1161 / 0 / 114 counts per minute
		(0.2-0.8') Brown to red brown SILT and CLAY, moist medium dense, medium plasticity, trace Organics				
		(0.8-1.5') Possible top of former surface soil horizon at 0.8' bgs	(0.5-1.5') 0 ppm		(0.5-1.5')	1245 / 0 / 104 counts per minute
	1.0	(0.8-1.5') Red brown SILT and CLAY some medium-fine Gravel well rounded, moist dense				
		(1.5-1.7') Dark brown medium SAND, moist, loose, well sorted	(1.5-2.5') 0 ppm		(1.5-2.5')	1326 / 2 / 125 counts per minute
	2.0	(1.7-5') Red brown TILL, CLAY, SILT, and some medium-coarse Gravel angular, moist to dry with depth, dense to very dense				
			(2.5-5') 0 ppm			
	3.0					
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

HTW DRILLING LOG

HOLE NO. **C1S2-12**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-14-18** / 11. DATE COMPLETED: **12-14-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90** %

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.2') Brown CLAY, moist, medium dense, high plasticity, little Organics (Fill) (0.2-0.8') Brown CLAY and SILT, some Organics, medium dense, moist (Fill)	(0-0.5') 0 ppm	NA	(0-0.5')	971 / 1 / 68 counts per minute
	1.0	(0.8-0.9') Brown fine-medium SAND, moist medium dense, possible former top of soil (0.9-4.5') Red brown TILL, moist medium dense to dense, trace Organics	(0.5-1.5') 0 ppm		(0.5-1.5')	1159 / 1 / 55 counts per minute
	2.0		(1.5-2.5') 0 ppm		(1.5-2.5')	1247 / 0 / 35 counts per minute
	3.0		(2.5-5') 0 ppm			
	4.0					
	5.0	(4.5-5') Red brown TILL, moist, dense to very dense, moist to dry (Silt and Clay, some medium-coarse Gravel, rouded) EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S2-13**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-12-18** — 11. DATE COMPLETED: **12-12-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.6') Dark brown CLAY and SILT, some organics, little fine-medium Gravel, moist, soft to medium dense (0.6') Black synthetic textile and pink ribbon (Fill) (0.6-1') Fine-coarse SAND and GRAVEL, some Silt, moist dense (Fill)	(0-0.5') 0 ppm	NA	(0-0.5')	1008 / 1 / 161 counts per minute
	1.0	(1-2.6') Dark brown TILL, dense, moist	(0.5-1.5') 0 ppm		(0.5-1.5')	1225 / 0 / 110 counts per minute
	2.0	(2.6-3') Red brown fine SAND and Silt lense, moist, medium dense, nonplastic	(1.5-2.5') 0 ppm		(1.5-2.5')	1151 / 0 / 109 counts per minute
	3.0	(3-5') TILL, red brown, moist to dry, dense to very dense	(2.5-5') 0 ppm			
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

HTW DRILLING LOG

HOLE NO. **C1S2-14**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**	SHEET 1 OF 1 SHEETS
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**	
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: **12-12-18**	11. DATE COMPLETED: **12-12-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**	
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**	
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**	

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.3') Dark brown SILT and fine Sand, some Organics, moist, medium dense (0.3-1.1') Red brown CLAY and SILT, medium dense, moist, medium plasticity (Fill)	(0-0.5') 0 ppm	NA	(0-0.5')	1118 / 0 / 119 counts per minute
	1.0	(1.1-2') Black fine SAND and SILT, little Silt and Organics at 1.1', possible former surface (Fill)	(0.5-1.5') 0 ppm		(0.5-1.5')	1075 / 0 / 131 counts per minute
	2.0	(2-5') TILL Red brown moist to dry, dense to very dense	(1.5-2.5') 0 ppm		(1.5-2.5')	1139 / 0 / 130 counts per minute
	3.0		(2.5-5') 0 ppm			
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S2-15**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-13-18** — 11. DATE COMPLETED: **12-13-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **4.7 ft bgs**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.9') Dark brown SILT and CLAY, some Organics, little fine-medium Gravel, moist, medium dense, ununiform (Fill)	(0-0.5') 0 ppm	NA	(0-0.5')	984 / 1 / 98 counts per minute
	1.0	(0.9-1.7') Dark brown CLAY and SILT, some coarse Gravel, angular, dense, appears disturbed material, Fill, moist	(0.5-1.5') 0 ppm		(0.5-1.5')	1097 / 2 / 125 counts per minute
	2.0	(1.7-2.5') Black to red brown SILT, some fine-medium Gravel, rounded, little fine Sand, little Organics (roots), little fine Sand, little organics (Roots), medium dense, moist	(1.5-2.5') 0 ppm		(1.5-2.5')	1213 / 1 / 118 counts per minute
	3.0	(2.5-5') Red brown TILL, SILT and CLAY, some fine-coarse Gravel, rounded and angular, dense to very dense, moist to dry with depth	(2.5-5') 0 ppm			
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S2-16**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**	SHEET 1 OF 1 SHEETS
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**	
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: **12-13-18**	11. DATE COMPLETED: **12-13-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**	
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**	
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**	

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90** %

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.3') Brown CLAY and SILT, some Organics, wet, soft, medium plasticity (0.3-0.6') Brown SILT and coarse GRAVEL, angular, dense, moist Fill – crushed stone	(0-0.5') 0 ppm	NA	(0-0.5')	1271 / 1 / 60 counts per minute
	1.0	(0.6-1.4') Brown CLAY and SILT, some medium-coarse Slag (blue, grey), porous, brittle, moist, dense (Fill), some organics	(0.5-1.5') 0 ppm		(0.5-1.5')	1206 / 10 / 197 counts per minute
	2.0	(2-2.9') Red brown, fine SAND, some Silt, moist, dense	(1.5-2.5') 0 ppm		(1.5-2.5')	1070 / 2 / 116 counts per minute
	3.0	(2.9-5') Red brown TILL, SILT and Clay, some fine-coarse Gravel, moist to dry with depth, little fine Sand lenses, dense	(2.5-5') 0 ppm			
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S3-01**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-6-18** — 11. DATE COMPLETED: **12-6-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.5') Dark brown SILT and CLAY, some Organics, moist, medium dense	(0-0.5') 0 ppm	NA	(0-0.5')	956 / 0 / 107 counts per minute
		(0.5-2.1') Red brown SILT and fine SAND, some coarse Gravel, angular to subangular, moist, medium dense to soft	(0.5-1.5') 0 ppm		(0.5-1.5')	982 / 2 / 73 counts per minute
	1.0		(1.5-2.5') 0 ppm			1039 / 0 / 109 counts per minute
	2.0	(2.1-2.4') Dark brown SILT, little fine Sand, some Organics, medium dense, moist			(2-3')	1271 / 0 / 122
		(2.4-5') TILL, dark brown to red brown, moist dense, to very dense, Silt and Clay some medium coarse Gravel	(2.5-5') 0 ppm			
	3.0					
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S3-02**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-6-18** — 11. DATE COMPLETED: **12-6-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-1.4') Brown SILT and CLAY, some Organics, little fine Gravel, moist, medium dense	(0-0.5') 0 ppm	NA	(0-0.5')	1058 / 0 / 1001195 / 0 / 90 counts per minute
	1.0		(0.5-1.5') 0 ppm		(0.5-1.5')	963 / 0 / 1011087 / 0 / 81 counts per minute
		(1.4-2') Dark brown SILT and fine SAND, moist, nonplastic, soft, Organics (Fill)	(1.5-2.5') 0 ppm		(1.5-2.5')	1065 / 0 / 1031033 / 0 / 88 counts per minute
	2.0	(2-2.6') Red brown, fine SAND and SILT, little fine Gravel, trace Organics				
		(2.6-3.7') Red brown fine SAND, little Silt, wet, medium dense, slow dilatancy	(2.5-5') 0 ppm			
	3.0					
		(3.7-5') TILL, red brown SILT and CLAY, some coarse Gravel, rounded to subrounded, moist, dense				
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S3-03**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-6-18** — 11. DATE COMPLETED: **12-6-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-1') Dark brown to red brown SILT and CLAY, some Organics, little medium Gravel, moist medium dense (Fill)	(0-0.5') 0 ppm	NA	(0-0.5')	1195 / 0 / 901058 / 0 / 100 counts per minute
	1.0	(1-1.8') Dark brown fine SAND and SILT, some Clay, little Organics, moist, medium dense	(0.5-1.5') 0 ppm		(0.5-1.5')	1087 / 0 / 81963 / 0 / 101 counts per minute
	2.0	(1.8-2.7') Red brown and great CLAY, medium dense, moist, low plasticity, little fine Gravel (Till)	(1.5-2.5') 0 ppm		(1.5-2.5')	1033 / 0 / 881065 / 0 / 103 counts per minute
	3.0	(2.7-3.6') TILL, SILT and CLAY, medium-coarse Gravel, moist, medium dense, red brown-brown	(2.5-5') 0 ppm			
	4.0	(3.6-4.2') Red brown fine SAND and SILT, some Clay, moist to wet, medium dense (4.2-5') TILL, red brown SILT and CLAY, some medium-coarse Gravel, moist, dense				
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S3-04**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**	SHEET 1 OF 1 SHEETS
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**	
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: **12-6-18**	11. DATE COMPLETED: **12-6-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**	
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**	
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.4') Dark brown fine SAND and SILT, moist, some Organics (grass, roots), little coarse Gravel (0.4-1.5') Dark brown SILT and CLAY, some coarse Gravel, trace Gravel, moist medium dense	(0-0.5') 0 ppm	NA	(0-0.5')	1171 / 0 / 73 counts per minute
	1.0		(0.5-1.5') 0 ppm		(0.5-1.5')	997 / 0 / 100 counts per minute
	2.0	(1.5-3.3') Red brown SILT and fine SAND, little Organics, moist, soft	(1.5-2.5') 0 ppm		(1.5-2.5')	1017 / 0 / 81 counts per minute
	3.0	(3.3-3.8') Red brown SILT and fine SAND, some Organics, medium dense, moist	(2.5-5') 0 ppm			
	4.0	(3.8-5') Grey brown TILL, SILT and CLAY, some coarse Gravel, moist, medium dense to dense				
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S3-05**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**	SHEET 1 OF 1 SHEETS
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**	
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: **12-13-18**	11. DATE COMPLETED: **12-13-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**	
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**	
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**	

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-1.1') Dark brown CLAY, wet, high plasticity, soft, Organics at surface (Fill)	(0-0.5') 0 ppm	NA	(0-0.5')	1118 / 0 / 88 counts per minute
	1.0	(1.1') Black synthetic textile, organics at interface (1.1-1.5') TILL, red brown Silt and Clay, some medium-coarse Gravel, moist to dry, dense to very dense	(0.5-1.5') 0 ppm		(0.5-1.5')	1109 / 0 / 112 counts per minute
	2.0		(1.5-2.5') 0 ppm		(1.5-2.5')	1162 / 1 / 97 counts per minute
	3.0		(2.5-5') 0 ppm			
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S3-06**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
SHEET 1 OF 1 SHEETS	
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-10-18** / 11. DATE COMPLETED: **12-10-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **4.8 ft bgs**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.8') Brown SILT and CLAY, some fine Gravel, wet, dense, little Organics (Fill)	(0-0.5') 0 ppm	NA	(0-0.5')	1180 / 0 / 60 counts per minute
		(0.8) Possible geotextile fabric (plastic fibers) at interface				
	1.0	(0.8-5') Brown to red brown TILL, SILT, and CLAY, medium-coarse Gravel, moist to dry, dense to very dense	(0.5-1.5') 0 ppm		(0.5-1.5')	1173 / 0 / 125 counts per minute
	2.0		(1.5-2.5') 0 ppm		(1.5-2.5')	1152 / 0 / 106 counts per minute
	3.0		(2.5-5') 0 ppm			
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S3-07**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**	SHEET 1 OF 1 SHEETS
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**	
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: **12-13-18**	11. DATE COMPLETED: **12-13-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**	
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **2.4 ft bgs**	
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**	

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.3') Dark brown CLAY, wet, high plasticity, soft (0.3') Black synthetic textile (0.3-1') Grey coarse GRAVEL, little Silt, set, dense	(0-0.5') 0 ppm	NA	(0-0.5')	1078 / 0 / 105 counts per minute
	1.0	(1-1.2') Black SILT, some Clay, wet, little Organics (1.2-2.4') Red brown fine SAND and SILT, wet, slow dilatancy, medium dense	(0.5-1.5') 0 ppm		(0.5-1.5')	1181 / 0 / 60 counts per minute
	2.0		(1.5-2.5') 0 ppm		(1.5-2.5')	899 / 0 / 94 counts per minute
		(2.4-5') Dark brown fine SAND, well sorted, wet, rapid dilatancy, medium dense	(2.5-5') 0 ppm			
	3.0					
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S3-08**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
SHEET 1 OF 1 SHEETS	
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-12-18** — 11. DATE COMPLETED: **12-12-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **0.2 ft bgs**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **0.8 ft bgs**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.5') Brown SILT and CLAY, little Organics, wet soft	(0-0.5') 0 ppm	NA	(0-0.5')	970 / 0 / 98 counts per minute
		(0.5') Black synthetic woven material, possible geosynthetic textile				
	1.0	(0.5-1.5') Course GRAVEL, angular, loose Fill (crushed stone)	(0.5-1.5') 0 ppm		(0.5-1.5')	793 / 2 / 131 counts per minute
	2.0	(1.5-2.3') Dark brown TILL, CLAY, and SILT, some medium-Gravel subangular, moist dense	(1.5-2.5') 0 ppm		(1.5-2.5')	1099 / 0 / 104 counts per minute
	3.0	(2.3-5') Red brown TILL, SILT, and CLAY, some fine-medium Gravel, little coarse Gravel, moist to dry, dense to very dense	(2.5-5') 0 ppm			
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

HTW DRILLING LOG

HOLE NO. **C1S3-09**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-13-18** / 11. DATE COMPLETED: **12-13-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90** %

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.8') Dark brown Organics at surface to CLAY, soft, wet	(0-0.5') 0 ppm	NA	(0-0.5')	1167 / 0 / 123 counts per minute
		(0.8') Black synthetic textile, possible geofabric				
	1.0	(0.8-1.1') Brown to grey medium-coarse GRAVEL, some Clay, little Organics, wet, dense	(0.5-1.5') 0 ppm		(0.5-1.5')	1148 / 0 / 119 counts per minute
		(1.1-3.9') Red brown TILL, Clay and Silt, some coarse Gravel, moist dense				
	2.0		(1.5-2.5') 0 ppm		(1.5-2.5')	1130 / 0 / 94 counts per minute
			(2.5-5') 0 ppm			
	3.0					
	4.0	(3.9-5') Red brown TILL, SILT and fine SAND, some coarse Gravel, medium dense, moist				
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S3-10**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-12-18** — 11. DATE COMPLETED: **12-12-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **3.3 ft bgs**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **2.5 ft bgs**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-1.1') Red brown CLAY and SILT, moist, medium dense, low plasticity, some Organics (grass, roots) (Fill)	(0-0.5') 0 ppm	NA	(0-0.5')	1195 / 0 / 136 counts per minute
	1.0	(1.1') Interface separated from soils below – Organics, grass at interface (geosynthetic fabric)	(0.5-1.5') 0 ppm		(0.5-1.5')	1330 / 1 / 158 counts per minute
		(1.1-1.4') Red brown SILT and CLAY, some medium Gravel, moist dense (Fill)	(1.5-2.5') 0 ppm		(1.5-2.5')	1102 / 2 / 176 counts per minute
	2.0	(1.4-1.6') Concrete – coarse Gravel in size (FILL)				
		(1.6-2.5') TILL red brown, silt and clay, dense, moist				
		(2.5-3.3') Red brown SILT, some fine Sand, little Clay, wet soft, rapid dilatancy	(2.5-5') 0 ppm			
	3.0					
		(3.3-5') TILL red brown Silt and Clay, medium-coarse Gravel, moist, dense with medium Sand lenses at 3.7-4' and 4.6-5', trace Silt in sand lenses				
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S3-11**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**	SHEET 1 OF 1 SHEETS
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**	
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: **12-12-18**	11. DATE COMPLETED: **12-12-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **4.5 ft bgs**	
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**	
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**	

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90** %

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-1.0') Dark brown, CLAY and SILT, wet to moist, soft to medium dense, some Organics, medium plasticity (Fill)	(0-0.5') 0 ppm	NA	(0-0.5')	1135 / 1 / 101 counts per minute
	1.0	(1.0') Black geosynthetic geotextile at interface (1.0-1.9') Dark brown SILT and CLAY, some fine Sand, little coarse Gravel and little Slag, moist medium dense	(0.5-1.5') 0 ppm		(0.5-1.5')	1149 / 0 / 146 counts per minute
	2.0	(1.9-5') TILL, red brown, Silt and Clay, some fine-coarse Gravel, moist to dry, non-plastic	(1.5-2.5') 0 ppm		(1.5-2.5')	1186 / 4 / 127 counts per minute
	3.0		(2.5-5') 0 ppm			
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

HTW DRILLING LOG

HOLE NO. **C1S3-12**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-12-18** / 11. DATE COMPLETED: **12-12-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **0.8 ft bgs**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **0.8 ft bgs**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.4') Red brown CLAY and SILT, wet, soft, high plasticity, little coarse Gravel, little Organics at interface (0.4') (0.4-0.9') Grey GRAVEL angular wet loose (Fill – crushed stone) little Silt and Clay at 0.9' (0.9-5') TILL red brown Silt and Clay and fine-coarse Gravel angular, moist to dry, dense to very dense	(0-0.5') 0 ppm	NA	(0-0.5')	1196 / 0 / 111 counts per minute
	1.0		(0.5-1.5') 0 ppm		(0.5-1.5')	1171 / 0 / 109 counts per minute
	2.0		(1.5-2.5') 0 ppm		(1.5-2.5')	1193 / 2 / 128 counts per minute
	3.0		(2.5-5') 0 ppm			
	4.0					
	5.0	EOB at 5' *No geotextile at 0.4 bgs				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S3-13**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**	SHEET 1 OF 1 SHEETS
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**	
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: **12-13-18**	11. DATE COMPLETED: **12-13-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**	
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**	
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**	

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90** %

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.7') Brown CLAY and SILT, some Organics, wet, soft, medium plasticity	(0-0.5') 0 ppm	NA	(0-0.5')	1169 / 2 / 183 counts per minute
	1.0	(0.7-1.6') Brown SILT, some Clay, little medium-fine Gravel, angular, moist, dense, disturbed soils (Fill)	(0.5-1.5') 0 ppm		(0.5-1.5')	1228 / 8 / 188 counts per minute
	2.0	(1.6-2.2') Dark brown fine SAND and SLT, some Organics (topsoil like) little fine Gravel, moist, soft,	(1.5-2.5') 0 ppm		(1.5-2.5')	1150 / 6 / 132 counts per minute
	3.0	(2.2-5") Red brown TILL, Silt and Clay, some fine-coarse Gravel, very dense, moist to dry with depth	(2.5-5') 0 ppm			
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S3-14**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-13-18** — 11. DATE COMPLETED: **12-13-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **4.6 ft bgs**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.6') Brown CLAY, moist medium dense, high plasticity, little Organics	(0-0.5') 0 ppm	NA	(0-0.5')	994 / 0 / 113 counts per minute
		(0.6-1.1') Dark brown SILT and CLAY, some medium-coarse Gravel, angular, little Organics (Fill), possible former surface topsoil				
	1.0	(1.1-1.9') Dark brown SILT and CLAY, some medium-coarse Gravel, angular, little Organics (Fill), possible former surface topsoil	(0.5-1.5') 0 ppm		(0.5-1.5')	1203 / 2 / 160 counts per minute
			(1.5-2.5') 0 ppm		(1.5-2.5')	1179 / 1 / 138 counts per minute
	2.0	(1.9-2') red brown fine SAND and SILT, some Organics (Fill)				
		(2-5') Red brown TILL, SILT and CLAY, some fine-coarse Gravel, angular to subrounded, moist to dry with depth, dense to very dense with depth	(2.5-5') 0 ppm			
	3.0					
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S4-01**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**	SHEET 1 OF 1 SHEETS
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**	
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: **12-6-18**	11. DATE COMPLETED: **12-6-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**	
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**	
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.3') Black SILT and CLAY, some Organics, wet to moist, soft, nonplastic (0.3-1.5') Dark brown SILT, some Organics, dry, medium dense	(0-0.5') 0 ppm	NA	(0-0.5')	1087 / 2 / 63 counts per minute
	1.0		(0.5-1.5') 0 ppm		(0.5-1.5')	956 / 0 / 93 counts per minute
	2.0	(1.5-2.4') Dark brown SILT and CLAY, dry to moist, medium dense, nonplastic	(1.5-2.5') 0 ppm		(1.5-2.5')	947 / 0 / 122 counts per minute
	3.0	(2.4-3.3') TILL, SILT and CLAY, dark brown, dense to medium dense, moist	(2.5-5') 0 ppm			
	4.0	(3.3-4.2') TILL, fine SAND, and SILT, some Clay, little coarse Gravel, medium dense, moist				
	5.0	(4.2-5') TILL, SILT and CLAY, some coarse Gravel, moist to dry, very dense EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S4-02**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
SHEET 1 OF 1 SHEETS	
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-10-18** — 11. DATE COMPLETED: **12-10-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **4.6 ft bgs**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **3.3 ft bgs**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.4') Dark brown SILT and fine SAND, some medium Gravel, little Organics (0.4-1.9') Grey brown coarse Gravel, and SILT, little Slag, moist, dense	(0-0.5') 0 ppm	NA	(0-0.5')	994 / 0 / 82 counts per minute
	1.0		(0.5-1.5') 0 ppm		90.5-1.5')	1066 / 0 / 93 counts per minute
	2.0	(1.9-3.3') Red brown TILL, SILT, and CLAY, some medium-coarse Gravel, angular to rounded, moist, dense	(1.5-2.5') 0 ppm		(1.5-2.5')	1224 / 0 / 100 counts per minute
	3.0		(2.5-5') 0 ppm			
	4.0	(3.3-3.9') Red brown SILT and fine SAND, medium dense, wet slow dilantancy (3.9-4.6') Red brown SILT, medium dense, wet, well-sorted, rapid dilatancy				
	5.0	(4.6-5') Red brown TILL, SILT and CLAY, medium-coarse Gravel, moist dense EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S4-03**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-10-18** / 11. DATE COMPLETED: **12-10-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **1.5 ft bgs**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.2') Dark brown SILT and ORGANICS, wet, soft (0.2-1.4') Red brown CLAY and SILT, little Organics, little fine-medium Gravel, angular, moist, dense (Fill)	(0-0.5') 0 ppm	NA	(0-0.5')	1122 / 0 / 83 counts per minute
	1.0		(0.5-1.5') 0 ppm		(0.5-1.5')	1204 / 0 / 58 counts per minute
		(1.4-2.4') Dark brown SAND and GRAVEL, some Silt, wet, loose	(1.5-2.5') 0 ppm		(1.5-2.5')	1116 / 0 / 106 counts per minute
	2.0					
		(2.4-5') Red brown TILL, SILT and CLAY, coarse Gravel/Cobble, dense, moist to dry	(2.5-5') 0 ppm			
	3.0					
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S4-04**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**	SHEET 1 OF 1 SHEETS
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**	
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: **12-10-18**	11. DATE COMPLETED: **12-10-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**	
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**	
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.6') Dark brown SILT and fine SAND, some medium-coarse Gravel, wet to moist, little Organics (Fill) (0.6-1.9') Red brown medium-coarse GRAVEL and SLAG, some coarse Sand, little Silt, moist dense (Fill)	(0-0.5') 0 ppm	NA	(0-0.5')	1207 / 0 / 81 counts per minute
	1.0		(0.5-1.5') 0 ppm		(0.5-1.5')	1046 / 1 / 52 counts per minute
	2.0	(1.9-2.7') Red brown fine SAND and SILT, little coarse Gravel, moist, dense	(1.5-2.5') 0 ppm		(1.5-2.5')	1148 / 4 / 111 counts per minute
	3.0	(2.7-5') Red brown TILL, SILT and CLAY, some medium-coarse Gravel, rounded, moist, dense	(2.5-5') 0 ppm			
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S4-05**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-10-18** / 11. DATE COMPLETED: **12-10-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **4.8 ft bgs**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.8') Brown SILT and CLAY, some Organics, little medium-coarse Gravel, angular, moist to medium dense (Fill)	(0-0.5') 0 ppm	NA	(0-0.5')	925 / 0 / 58 counts per minute
	1.0	(0.8-1.2') Grey coarse GRAVEL (2-3"), little Silt above geotextile fabric (2 layers observed – black fabric woven) (1.2-5') Red brown TILL, SILT and CLAY, some fine-coarse Gravel, moist to dry, dense to very dense	(0.5-1.5') 0 ppm		(0.5-1.5')	1101 / 0 / 119 counts per minute
	2.0		(1.5-2.5') 0 ppm		(1.5-2.5')	1208 / 0 / 101 counts per minute
	3.0		(2.5-5') 0 ppm			
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

HTW DRILLING LOG

HOLE NO. **C1S4-06**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
SHEET 1 OF 1 SHEETS	
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-10-18** — 11. DATE COMPLETED: **12-10-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **4 ft bgs**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **4 ft bgs**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.3') Dark brown SILT and fine GRAVEL, dense, moist, little Organics	(0-0.5') 0 ppm	NA	(0-0.5')	886 / 0 / 20 counts per minute
		(0.3-0.6') Grey to dark brown coarse GRAVEL with fine-medium Gravel, some Silt, moist, dense (Fill)				
	1.0	(0.6-2.5') Dark brown to black SILT and Clay, some coarse Gravel, angular, moist to dry	(0.5-1.5') 0 ppm		(0.5-1.5')	1474 / 0 / 408 counts per minute
	2.0		(1.5-2.5') 0 ppm		(1.5-2.5')	1684 / 0 / 118 counts per minute
		(2.5-3.8') Red brown TILL, SILT and CLAY, some medium-coarse Gravel, moist, dense	(2.5-5') 0 ppm			
	3.0					
		(3.8-4.1') Red brown fine SAND, wet, dense, rapid dilatancy				
	4.0	(4.1-5') Red brown TILL, SILT and CLAY, some medium-coarse Gravel, moist, dense				
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S4-07**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street** 9. SURFACE ELEVATION:
	10. DATE STARTED: **12-11-18** — 11. DATE COMPLETED: **12-11-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.5') Dark brown SILT and CLAY, some Organics, wet, soft (fabric at 0.5')	(0-0.5') 0 ppm	NA	(0-0.5')	1178 / 0 / 98 counts per minute
		(0.5-1.2') Grey coarse Gravel, angular, loose, moist, FILL – crushed stone, synthetic woven fabric, black, organics under fabric	(0.5-1.5') 0 ppm		(0.5-1.5')	1059 / 0 / 135 counts per minute
	1.0	(1.2-2.2') Red brown SILT and CLAY, some coarse Gravel, angular, moist, dense	(1.5-2.5') 0 ppm		(1.5-2.5')	1159 / 0 / 122 counts per minute
	2.0	(2.2") Weathered interface – oxidation red brown, not uniform with TILL below, clear separation				
		(2.2-5') TILL – SILT and CLAY, some medium-fine Gravel, little coarse Gravel, moist to dry, dense to very dense	(2.5-5') 0 ppm			
	3.0					
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

HTW DRILLING LOG

HOLE NO. **C1S4-08**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**	SHEET 1 OF 1 SHEETS
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**	
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: **12-12-18**	11. DATE COMPLETED: **12-12-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**	
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**	
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**	

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90** %

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.4') Dark brown SILT and fine-coarse Gravel, moist, dense, angular (0.4-1.5') Grey coarse GRAVEL and some Slag, angular, porous, grey-blue coarse Gravel in size (Fill)	(0-0.5') 0 ppm	NA	(0-0.5')	969 / 1 / 57 counts per minute
	1.0		(0.5-1.5') 0 ppm		(0.5-1.5')	1097 / 3 / 159 counts per minute
	2.0	(1.5-3.1') TILL, red brown Silt and Clay, some fine-coarse Gravel, moist, dense, nonplastic	(1.5-2.5') 0 ppm		(1.5-2.5')	1173 / 1 / 178 counts per minute
			(2.5-5') 0 ppm			
	3.0	(3.1') Uncomformity in till layers marked by erosional feature, black Silt, not uniform to Till below – loosely separated (3.1-5') Red brown TILL, SILT and CLAY, some coarse Gravel, angular, dense, moist to dry with depth.				
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

HTW DRILLING LOG

HOLE NO. **C1S4-09**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-11-18** — 11. DATE COMPLETED: **12-11-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-1.0') SILT and CLAY, red brown, some medium-coarse Gravel, little Organics, moist medium-dense (Fill)	(0-0.5') 0 ppm	NA	(0-0.5')	1100 / 3 / 166 counts per minute
	1.0	(1.0') Synthetic fibers, black woven, possible geotextile fabric (1.0-1.7') Red brown SILT and CLAY, some fine Gravel, little Organics under woven synthetic materials (Fill)	(0.5-1.5') 0 ppm		(0.5-1.5')	1098 / 4 / 143 counts per minute
	2.0	(1.7-2.3') Red brown SILT and CLAY, some asphalt and Slag, angular, porous, black, green, white, dense moist (Fill)	(1.5-2.5') 0 ppm		(1.5-2.5')	1234 / 0 / 160 counts per minute
	3.0	(2.3-5') TILL, red brown Silt and Clay, some medium-coarse Gravel, angular, moist to dry, dense to very dense.	(2.5-5') 0 ppm			
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

HTW DRILLING LOG

HOLE NO. **C1S4-10**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
SHEET 1 OF 1 SHEETS	
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-11-18** — 11. DATE COMPLETED: **12-11-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.5') Dark brown SILT and CLAY, some medium-coarse Gravel, angular, moist soft to dense (0.5-1.8') Grey crushed STONE and SLAG, very coarse Gravel, dry dense, Slag is porous and vitreous, black, blue, white, green	(0-0.5') 0 ppm	NA	(0-0.5')	964 / 0 / 72 counts per minute
	1.0		(0.5-1.5') 0 ppm		(0.5-1.5')	907 / 0 / 152 counts per minute
	2.0	(1.8-3.5') Red brown TILL, Silt and Clay, some medium-coarse Gravel, moist to dry	(1.5-2.5') 0 ppm		(1.5-2.5')	1005 / 2 / 210 counts per minute
	3.0		(2.5-5') 0 ppm			
		(3.5-3.7') Light brown fine SAND lens, medium dense dry				
	4.0	(3.7-5') Red brown TILL, SILT and Clay, some medium-coarse Gravel, dry, dense				
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

HTW DRILLING LOG

HOLE NO. **C1S4-11**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-11-18** — 11. DATE COMPLETED: **12-11-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-1.0') Organics at surface, brown SILT and CLAY, little coarse Gravel, angular, moist medium dense, wet to moist	(0-0.5') 0 ppm	NA	(0-0,5')	1103 / 3 / 139 counts per minute
	1.0	(1.0-1.1') SLAG, white blue porous, angular, dense fine-coarse Gravel	(0.5-1.5') 0 ppm		(0.5-1.5')	1291 / 0 / 181 counts per minute
		(1.1-1.7') Dark brown TILL, Silt and Clay, some fine Gravel, rounded, moist dense	(1.5-2.5') 0 ppm		(1.5-2.5')	1165 / 2 / 122 counts per minute
	2.0	(1.7-5') Red brown TILL, Silt and Clay, some fine-coarse Gravel, moist to dry, dense to very dense	(2.5-5') 0 ppm			
	3.0					
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S4-12**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**	SHEET 1 OF 1 SHEETS
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**	
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: **12-11-18**	11. DATE COMPLETED: **12-11-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**	
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **3.6 ft bgs**	
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**	

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.5') Brown SILT and CLAY, some medium-coarse Gravel, wet to moist, medium dense (0.5-1.5') Grey, medium-coarse GRAVEL and SLAG, little Silt, little Asphalt (Fill), dry, loose	(0-0.5') 0 ppm	NA	(0-0.5')	1024 / 3 / 104 counts per minute
	1.0		(0.5-1.5') 0 ppm		(0.5-1.5')	996 / 4 / 107 counts per minute
	2.0	(1.5-1.9') Dark brown SILT and CLAY, moist, dense (Fill), low plasticity (1.9-2.6') SLAG, red brown to brown, fine-coarse Gravel in size, brittle, porous, loose (Fill)	(1.5-2.5') 0 ppm		(1.5-2.5')	924 / 2 / 109 counts per minute
		(2.6-4.4') Red brown, fine SAND, little Silt, moist to wet, slow to rapid dilatancy at 3.6'	(2.5-5') 0 ppm			
	3.0	(4.4-5') Dark brown fine SAND, well sorted, loose, wet				
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

HTW DRILLING LOG

HOLE NO. **C1S4-13**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**	SHEET 1 OF 1 SHEETS
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**	
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: **12-13-18**	11. DATE COMPLETED: **12-13-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **4.5 ft bgs**	
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**	
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**	

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90** %

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.5') Brown CLAY, moist, medium dense, high plasticity, little Organics (Fill)	(0-0.5') 0 ppm	NA	(0-0.5')	1126 / 3 / 130 counts per minute
		(0.5-1.3') Brown SILT and CLAY, some medium-coarse Gravel, moist medium dense (Fill)	(0.5-1.5') 0 ppm		(0.5-1.5')	1227 / 0 / 134 counts per minute
	1.0	(1.3-1.5') Brown medium-coarse SAND, little Silt, some medium Gravel, trace Organics at 1.5', possible former top of soil				
		(1.5-2.7') Red brown CLAY, some Silt, medium dense, moist, medium plasticity	(1.5-2.5') 0 ppm		(1.5-2.5')	1256 / 1 / 144 counts per minute
	2.0					
		(2.7-4.8') Red brown TILL, moist to dry, dense to very dense with depth	(2.5-5') 0 ppm			
	3.0					
	4.0					
		(4.8-5') Red brown fine SAND and SILT, some Organics, dry, sop soil like, medium dense				
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C1S4-14**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**	SHEET 1 OF 1 SHEETS
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**	
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: **12-13-18**	11. DATE COMPLETED: **12-13-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **4.5 ft bgs**	
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**	
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**	

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-1') Brown SILT and medium-coarse Gravel, angular, medium dense, dry (Fill)	(0-0.5') 0 ppm	NA	(0-0.5')	903 / 0 / 8 counts per minute
	1.0	(1-1.4') Brown CLAY and SILT, moist, medium dense, trace Organics	(0.5-1.5') 0 ppm		(0.5-1.5')	1103 / 0 / 63 counts per minute
		(1.4-2') Dark brown fine SAND and SILT, medium dense, moist	(1.5-2.5') 0 ppm		(1.5-2.5')	1061 / 1 / 18 counts per minute
	2.0	(2-2.7') Black, find SAND, moist, medium dense				
		(2.7-3.9') Red brown fine SAND, moist, medium dense	(2.5-5') 0 ppm			
	3.0					
	4.0	(3.9-5') Red brown and white marbled CLAY, medium dense, moist, medium plasticity				
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C2-01**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-5-18** / 11. DATE COMPLETED: **12-5-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **3.0 ft bgs**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.5') Black to brown SILT and Organics, some Silt, wet to moist, soft	(0-0.5') 0 ppm	NA	(0-0.5')	990 / 0 / 214 counts per minute
		(0.5-1') Red brown CLAY and SILT, some Organics (roots, branches), little medium-coarse Gravel, moist	(0.5-1.5') 0 ppm		(0.5-1.5')	1087 / 0 / 246 counts per minute
	1.0	(1-2.6') Brown SILT and fine SAND, little Clay, little Organics, dense moist	(1.5-5') 0 ppm		(1.5-2.5')	1188 / 1 / 264 counts per minute
	2.0					
		(2.6-4.4') Red brown find SAND well sorted, wet, medium dense				
	3.0					
	4.0					
		(4.4-5') Red brown fine SAND and fine GRAVEL, angular, medium dense, moist, poorly sorted				
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

HTW DRILLING LOG

HOLE NO. **C2-02**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
SHEET 1 OF 1 SHEETS	
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-5-18** / 11. DATE COMPLETED: **12-5-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.5') Dark brown SILT and CLAY, some Organics (twigs, leaves, roots), soft, moist, nonplastic	(0-0.5') 0 ppm	NA	(0-0.5')	862 / 0 / 256 counts per minute
		(0.5-1.9') Brown SILT and CLAY, some Slag, coarse Gravel, little Organics (Fill), moist	(.5-1.5') 0 ppm		(0.5-1.5')	1255 / 0 / 242 counts per minute
	1.0					
		(1.9-2.6') Dark brown SILT and CLAY, some fine Sand, nonplastic, moist dense	(1.5-5') 0 ppm		(1.5-2.5')	926 / 0 / 276 counts per minute
	2.0					
		(2.6-5') Red brown fine SAND and SILT, nonplastic, moist, medium dense				
	3.0					
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C2-03**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
SHEET 1 OF 1 SHEETS	
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-5-18** / 11. DATE COMPLETED: **12-5-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90** %

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.9') Brown SILT and CLAY, some medium-coarse Gravel, subrounded, little Organics, moist, medium dense	(0-0.5') 0 ppm	NA	(0-0.5')	939 / 0 / 233 counts per minute
	1.0	(0.9-2.2') Light brown SILT, some Clay, little medium Gravel, trace Organics, medium dense, moist	(0.5-1.5') 0 ppm		(0.5-1.5')	1108 / 1 / 268 counts per minute
	2.0	(2.2-5') Light brown TILL, CLAY, and SILT, some medium-coarse Gravel, subrounded to angular, moist dense	(1.5-5') 0 ppm		(1.5-2.5')	1113 / 1 / 293 counts per minute
	3.0					
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C2-04**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**	SHEET 1 OF 1 SHEETS
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**	
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: **12-5-18**	11. DATE COMPLETED: **12-5-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**	
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**	
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**	

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.7') Black SILT and CLAY, some coarse Gravel, little Organics, slight petroleum-like odor, some coal cinders, soft, wet to moist	(0-0.5') 0 ppm	NA	(0-0.5')	933 / 0 / 284 counts per minute
	1.0	(0.7-2') Black to red brown, SILT and CLAY, some coarse Gravel, little Fill (wood), medium dense, moist	(0.5-1.5') 0 ppm		(0.5-1.5')	1222 / 0 / 254 counts per minute
	2.0	(2-4') Red brown TILL, Silt and Clay, medium-coarse Gravel, angular, moist, very dense	(1.5-5') 0 ppm		(1.5-2.5')	1178 / 3 / 316 counts per minute
	3.0					
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C2-05**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**	SHEET 1 OF 1 SHEETS
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**	
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: **12-5-18**	11. DATE COMPLETED: **12-5-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**	
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**	
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**	

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90** %

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.3') Dark brown SILT, some Clay, little Organics, little coarse Gravel, wet to moist soft	(0-0.5') 0 ppm	NA	(0-0.5')	979 / 1 / 241 counts per minute
		(0.3-1.5') Red brown SILT and CLAY, some coarse Gravel, Slag, little Organics (wood), moist medium dense (Fill)	(0.5-1.5') 0 ppm		(0.5-1.5')	1289 / 0 / 236 counts per minute
	1.0					
		(1.5-2.5') Red brown TILL, Silt and Clay, some medium-coarse Gravel, very dense, moist	(1.5-5') 0 ppm		(1.5-2.5')	1282 / 3 / 292 counts per minute
	2.0					
		(2.5-4.5') Light brown SILT, trace fine Sand, nonplastic, moist, medium dense				
	3.0					
	4.0					
		(4.5-4.6') Red brown CLAY lense, moist, medium dense, low plasticity, trace find Gravel				
	5.0	(4.6-4.8') Red brown SILT, moist, medium dense, nonplastic EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C2-06**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
SHEET 1 OF 1 SHEETS	
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-12-18** — 11. DATE COMPLETED: **12-12-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **2 ft bgs**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.3') Dark brown, medium-coarse GRAVEL and Organics, loose, wet (0.3-1.6') Black and brown medium-coarse SLAG, some Silt, little Clay, wet, loose to medium dense	(0-0.5') 0 ppm	NA	(0-0.5')	806 / 0 / 29 counts per minute
	1.0		(0.5-1.5') 0 ppm		(0.5-1.5')	957 / 0 / 69 counts per minute
		(1.6-2.1') Red brown, fine SAND and SILT, medium dense, wet	(1.5-2.5') 0 ppm		(1.5-2.5')	1077 / 0 / 120 counts per minute
	2.0	(2.1-5') Red brown TILL, Silt and Clay, medium-coarse Gravel, dense, moist to dry				
			(2.5-5') 0 ppm			
	3.0					
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

HTW DRILLING LOG

HOLE NO. **C2-07**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
SHEET 1 OF 1 SHEETS	
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-6-18** / 11. DATE COMPLETED: **12-6-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.5') Grey coarse GRAVEL and COBBLES, some Organics, moist dense	(0-0.5') 0 ppm	NA	(0-0.5')	938 / 0 / 17 counts per minute
		(0.5-0.8') Grey brown SILT and fine GRAVEL, some Organics, moist, medium dense, Fill				
	1.0	(0.8-2.5') Grey to brown separated from above interval with organic lense (leaves, twigs) SILT and fine GRAVEL, some coarse Gravel, medium coarse Slag, metal filings, red brown, dense, moist (Fill), colors range from red brown, dark blue, grey, green)	(0.5-1.5') 0 ppm		0.5-1.5')	972 / 0 / 46 counts per minute
	2.0		(1.5-2.5') 0 ppm			990 / 0 / 169 counts per minute
		(2.5-4') TILL, brown SILT and CLAY, some medium coarse angular, subangular Gravel, moist, dense	(2.5-5') 0 ppm		(3.4-4.5')	1194 / - / - counts per minute
	3.0					
	4.0	(4-5') TILL, fine SAND and SILT, some rounded Gravel, moist, dense				
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C2-08**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**	SHEET 1 OF 1 SHEETS
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**	
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: **12-4-18**	11. DATE COMPLETED: **12-4-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **2 ft bgs**	
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**	
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**	

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90** %

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0.0-1.5) Dark brown SILT some Clay, Organics (roots) moist, soft to medium dense	(0-0.5') 0 ppm	NA	(0-0.5')	864 / 0 / 122 counts per minute
	1.0		(0.5-1.5') 0 ppm		(0.5-1.5')	888 / 2 / 144 counts per minute
	2.0	(1.5-1.8') Dark brown fine SAND and SILT, Organics (roots), moist soft (1.8-2.3') Dark brown SILT some fine Sand, Organics, soft-medium dense, wet	(1.5-5') 0 ppm		(1.5-2.5')	1089 / 1 / 144 counts per minute
	3.0	(2.3-5') Brown CLAY and SILT, some medium-coarse subangular Gravel, moist to dry, very dense (Till)				
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C2-09**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**	SHEET 1 OF 1 SHEETS
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**	
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: **12-4-18**	11. DATE COMPLETED: **12-4-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **3.3 ft bgs**	
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**	
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**	

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90** %

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.1) Dark brown SILT and Clay, low plasticity, no dilatancy, moist soft to medium dense	(0-0.5') 0 ppm	NA	(0-0.5')	928 / 2 / 142 counts per minute
	1.0	(1.1-1.7') Dark brown SILT and fine Sand, some fine Gravel, moist medium dense	(0.5-1.5') 0 ppm		(0.5-1.5')	1152 / 4 / 129 counts per minute
	2.0	(1.7-3.3') Brown SILT and medium Gravel, medium dense to soft, moist, nonplastic	(1.5-5') 0 ppm		(1.5-2.5')	1108 / 0 / 152 counts per minute
	3.0	(3.3-5') Red brown fine SAND, trace Silt, moist to wet, medium dense				
	4.0	(4.5-5') Light brown SILT, dry loose stratified				
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C2-10**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
SHEET 1 OF 1 SHEETS	
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-5-18** — 11. DATE COMPLETED: **12-5-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-2.1') Dark brown to brown SILT and fine SAND, some coarse angular to subrounded, little Organics, moist, low plasticity, medium dense	(0-0.5') 0 ppm	NA	(0-0.5')	1070 / 3 / 252 counts per minute
	1.0		(0.5-1.5') 0 ppm		(0.5-1.5')	1278 / 1 / 244 counts per minute
	2.0	(2.1-2.5') Dark brown fine SAND, some Silt, little Clay, soft, wet, no plasticity (2.5-2.9') Same as above, moist	(1.5-5') 0 ppm		(1.5-2.5')	1077 / 0 / 263 counts per minute
	3.0	(2.9-5') Red brown TILL, Clay and Silt with fine-coarse Gravel, angular, very dense, dry				
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C2-11**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
SHEET 1 OF 1 SHEETS	
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-6-18** / 11. DATE COMPLETED: **12-6-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.4') Dark brown SILT and Organics, wet, soft, nonplastic (0.4-1.7') Brown to red brown SILT and CLAY, some Organics, little medium Gravel, rounded, medium dense, moist	(0-0.5') 0 ppm	NA	(0-0.5')	1076 / 2 / 250 counts per minute
	1.0		(0.5-1.5') 0 ppm		(0.5-1.5')	1097 / 1 / 304 counts per minute
	2.0	(1.7-1.9') Red brown to light brown SILT, some Clay, little fine Sand, moist, medium dense (1.9-5') TILL, moist, dense to very dense, Silt and Clay, some coarse Gravel	(1.5-2.5') 0 ppm		(1.5-2.5')	1022 / 1 / 296 counts per minute
	3.0		(2.5-5') 0 ppm			1044 / 1 / 316 counts per minute
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C2-12**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
SHEET 1 OF 1 SHEETS	
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-6-18** / 11. DATE COMPLETED: **12-6-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.4') Dark brown SILT and CLAY, some Organics (roots, grass, moss), wet to moist, medium dense, low plasticity	(0-0.5') 0 ppm	NA	(0-0.5')	855 / 0 / 121 counts per minute
	1.0	(0.4-1.7') Dark brown SILT and CLAY, some Organics (roots, grass, moss), wet to moist, medium dense, low plasticity	(0.5-1.5') 0 ppm		(0.5-1.5')	1084 / 0 / 130 counts per minute
	2.0	(1.7-1.9') Brown SILT and SLAG, some Clay (1.9-2.2') Dark brown SILT and CLAY, moist, medium dense, low plasticity (Fill)	(1.5-2.5') 0 ppm		(1.5-2.5')	1067 / 0 / 194 counts per minute
	3.0	(2.2-2.5') Dark brown SILT and fine SAND, little Clay, some Organics, moist, medium dense (Fill) (2.5-3.4') Dark brown SILT and fine SAND, little Clay, some coarse Gravel	(2.5-5') 0 ppm			
	4.0	(3.4-5') TILL, SILT and CLAY, some medium coarse Gravel, angular, very dense, moist				
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C2-13**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**	SHEET 1 OF 1 SHEETS
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**	
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: **12-4-18**	11. DATE COMPLETED: **12-4-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**	
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**	
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**	

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90** %

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0.0-1.1) Dark brown SILT and CLAY, some Organics, little Gravel, angular, nonplastic, moist medium, dense	(0-0.5') 0 ppm	NA	(0-0.5')	908 / 2 / 118 counts per minute
	1.0	(1.1-2.7') Dark brown SILT and SLAG, coarse Gravel, dense, moist, angular (fill)	(0.5-1.5') 0 ppm		(0.5-1.5')	1221 / 4 / 202 counts per minute
	2.0		(1.5-5') 0 ppm		(1.5-2.5')	1262 / 2 / 157 counts per minute
	3.0	(2.7-5') Red brown TILL, Silt and Clay, some medium coarse Gravel, very dense moist to dry				
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C2-14**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**	SHEET 1 OF 1 SHEETS
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**	
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: **12-4-18**	11. DATE COMPLETED: **12-4-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **1.4 ft bgs**	
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**	
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-1.3) Dark brown SILT and medium-coarse Gravel, rounded, some Organics, moist, nonplastic, soft to medium dense	(0-0.5') 0 ppm	NA	(0-0.5')	1128 / 0 / 117 counts per minute
			(.5-1.5') 0 ppm		(0.5-1.5')	1196 / 3 / 134 counts per minute
	1.0	(1.3-1.9') Brown medium-coarse GRAVEL, angular, poorly sorted, wet, medium dense (slag fill)	(1.5-5') 0 ppm		(1.5-2.5')	1096 / 1 / 150 counts per minute
	2.0	(1.9-2.1') Dark brown Clay lense, medium plasticity, moist, medium stiff (2.1-2.6') Light brown SILT and SLAG, moist, medium dense				
		(2.6-5') Brown TILL, Clay and Silt, some medium-coarse Gravel, very dense, slightly moist to dry				
	3.0					
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C2-15**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
SHEET 1 OF 1 SHEETS	
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-4-18** / 11. DATE COMPLETED: **12-4-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **3 ft bgs**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90** %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0.0-1.5) Dark Brown SILT and CLAY, some Organics, trace fine Gravel, moist, soft, low plasticity.	(0-0.5') 0 ppm	NA	(0-0.5')	1098 / 2 / 111 counts per minute
	1.0		(.5-1.5') 0 ppm		(0.5-1.5')	1033 / 1 / 138 counts per minute
	2.0	(1.5-2.5') Brown SILT, some Clay, Organics, moist, medium stiff, non plastic	(1.5-5') 0 ppm		(1.5-2.5')	997 / 2 / 120 counts per minute
		(2.5-3.4') Brown SILT, some fine Sand, non-plastic, rapid dilatancy, wet				
	3.0	(3.4-5') Brown to red brown TILL, Clay and Silt, some medium coarse Gravel, dense, moist, subrounded Gravel				
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C2-16**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
SHEET 1 OF 1 SHEETS	
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-4-18** / 11. DATE COMPLETED: **12-4-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **1.1 ft bgs**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90** %

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-1.1) Dark brown SILT, some Organics, moist, soft no plasticity	(0-0.5') 0 ppm	NA	(0-0.5')	982 / 2 / 116 counts per minute
	1.0	(1.1-1.9') Light brown fine SAND some Silt, wet rapid dilatancy, very soft	(.5-1.5') 0 ppm		(0.5-1.5')	1090 / 0 / 124 counts per minute
	2.0	(1.9-3') Light brown SILT, trace Organics, dry medium dense, no plasticity	(1.5-5') 0 ppm		(1.5-2.5')	1168 / 0 / 146 counts per minute
	3.0	(3-4.5') Brown TILL, Silt and Clay with medium Gravel, angular, very dense, dry				
	4.0	(4.5-5') Light brown SILT, dry, loose, stratified				
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **C2-17**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
SHEET 1 OF 1 SHEETS	
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-5-18** — 11. DATE COMPLETED: **12-5-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.3') Dark brown SILT and Organics, wet to moist, soft, low plasticity	(0-0.5') 0 ppm	NA	(0-0.5')	1289 / 1 / 107 counts per minute
		(0.3-0.7') Grey coarse GRAVEL angular, poorly sorted, moist, dense	(.5-1.5') 0 ppm		(0.5-1.5')	1152 / 1 / 151 counts per minute
	1.0	(0.7-1.5') Red brown SILT and CLAY, some medium-coarse Gravel, moist, dense (Till like)				
		(1.5-2.7') Dark brown TILL SILT, and fine SAND, some medium-coarse Gravel, rounded to subangular, moist, dense	(1.5-5') 0 ppm		(1.5-2.5')	1080 / 1 / 147 counts per minute
	2.0					
	3.0	(2.7-5') Red brown TILL, SILT, and CLAY, medium-coarse Gravel, medium dense to dense, moist, Cobble				
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **CP-01**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
SHEET 1 OF 1 SHEETS	
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-11-18** — 11. DATE COMPLETED: **12-11-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.5') Red brown SILT and CLAY, some medium-coarse Gravel, moist, dense (Fill)	(0-0.5') 0 ppm	NA	(0-0.5')	970 / 0 / 85 counts per minute
		(0.5-1') Dark brown SILT and Brick, vitreous clay fragments, black Silt observed coating the clay fragments, loose, moist (Fill)				
	1.0	(1-1.5') Dark brown fine SAND and SILT, moist, dense	(0.5-1.5') 0 ppm		(0.5-1.5')	1216 / 0 / 60 counts per minute
		(1.5-5') Dark brown TILL, SILT and CLAY, medium-coarse Gravel, angular to rounded, moist to dry, dense	(1.5-2.5') 0 ppm		(1.5-2.5')	1022 / 0 / 91 counts per minute
	2.0					
			(2.5-5') 0 ppm			
	3.0					
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **CP-02**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-11-18** / 11. DATE COMPLETED: **12-11-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 Samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0') Concrete slab (0-0.4') Grey coarse GRAVEL, dry, dense, angular (Fill) (0.4-1') Red brown fine SAND and SILT, moist, dense	(0-0.5') 0 ppm	NA	(0-0.5')	1110 / 2 / 71 counts per minute
	1.0		(0.5-1.5') 0 ppm		(0.5-1.5')	1125 / 2 / 125 counts per minute
	2.0	(1-5') Red brown TILL, SILT and CLAY, medium-coarse Gravel, angular to rounded, moist to dry, dense	(1.5-2.5') 0 ppm		(1.5-2.5')	1169 / 3 / 69 counts per minute
	3.0		(2.5-5') 0 ppm			
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **Hotspot#1**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
SHEET 1 OF 1 SHEETS	
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-13-18** / 11. DATE COMPLETED: **12-13-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.4') Brown CLAY and SILT, some Organics (grass), wet soft medium plasticity	(0-0.5') 0 ppm	NA	(0-0.5')	1204 / 1 / 140 counts per minute
		(0.4') Black synthetic textile				
		(0.4-0.9') Brown SILT, some Clay, little fine Sand, trace fine Gravel, wet to moist, medium dense	(0.5-1.5') 0 ppm		(0.5-1.5')	1377 / 4 / 168 counts per minute
	1.0	(0.9-5') Red brown TILL, Silt and Clay, some fine-coarse Gravel, subangular to rounded, moist to dry, dense to very dense with depth				
			(1.5-2.5') 0 ppm		(1.5-2.5')	1170 / 26 / 272 counts per minute
	2.0					
			(2.5-5') 0 ppm			
	3.0					
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

HTW DRILLING LOG

HOLE NO. **Hotspot#2**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
SHEET 1 OF 1 SHEETS	
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-14-18** / 11. DATE COMPLETED: **12-14-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.4') Dark brown SILT and CLAY, some Organics, little fine-medium Gravel, wet, soft	(0-0.5') 0 ppm	NA	(0-0.5')	12756 / 35 / 1818 counts per minute
		(0.4') Interface – black synthetic textile				
		(0.4-0.9') Dark brown SILT and some Clay, little medium-fine Gravel, wet to moist, medium dense	(0.5-1.5') 0 ppm		(0.5-1.5')	2789 / 113 / 2121 counts per minute
	1.0	(0.9-1.1') SILT and CLAY, moist medium dense, red brown				
		(1.1-1.3') Grey medium-coarse GRAVEL, some Silt, moist loose to medium dense				
		(1.3-5') TILL, CLAY, and SILT, moist to dry with depth, dense to very dense, some fine-coarse Gravel	(1.5-2.5') 0 ppm		(1.5-2.5')	1421 / 18 / 319 counts per minute
	2.0					
			(2.5-5') 0 ppm			
	3.0					
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

HTW DRILLING LOG

HOLE NO. **Hotspot #3**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-18-18** / 11. DATE COMPLETED: **12-18-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90** %

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-3.1') Brown SILT and CLAY, some medium-coarse Gravel and Slag, angular, porous (blue, yellow), little Organics (wood, roots), moist, medium dense	(0-0.5') 0 ppm	NA	(0-0.5')	1147 / 1 / 61 counts per minute
	1.0		(0.5-1.5') 0 ppm		(0.5-1.5')	1038 / 4 / 84 counts per minute
	2.0		(1.5-2.5') 0 ppm		(1.5-2.5')	1053 / 0 / 69 counts per minute
			(2.5-5') 0 ppm			
	3.0	(3.1-4.1') Dark brown SILT and fine SAND, some Clay, little coarse Gravel, moist, medium dense, possible top soil horizon				
	4.0	(4.1-5') Red brown TILL, SILT and CLAY, some medium-coarse Gravel, very dense, dry				
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **Hotspot #4**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**	SHEET 1 OF 1 SHEETS
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**	
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: **12-17-18**	11. DATE COMPLETED: **12-17-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**	
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**	
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**	

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90** %

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-1.3') Brown SILT and CLAY, some medium Gravel, angular to subrounded, little Organics, wet to moist, soft to medium dense with depth (Fill)	(0-0.5') 0 ppm	NA	(0-0.5')	1203 / 0 / 66 counts per minute
	1.0	(1.3-1.8') Green, yellow, black, blue SLAG, porous angular, vitreous, medium-coarse Gravel in size, medium dense, dry	(0.5-1.5') 0 ppm		(0.5-1.5')	1206 / 1 / 69 counts per minute
	2.0	(1.8-2.5') Red brown TILL, Silt, some Clay, fine-coarse Gravel, moist dense	(1.5-2.5') 0 ppm		(1.5-2.5')	1178 / 1 / 64 counts per minute
	3.0	(2.5-5') Red brown TILL, Clay, and Silt, some coarse Gravel, little Organics, moist, low plasticity	(2.5-5') 0 ppm			
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **Hotspot #5**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**	SHEET 1 OF 1 SHEETS
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**	
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: **12-17-18**	11. DATE COMPLETED: **12-17-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**	
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**	
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**	

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90** %

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.4') Brown SILT and CLAY, some Organics, moist, soft (0.4') SLAG, blue-grey porous, angular, some Organics, possibly top of former soil horizon (Fill)	(0-0.5') 0 ppm	NA	(0-0.5')	1162 / 1 / 52 counts per minute
	1.0	(0.4-3') Red brown SILT and CLAY, some fine-coarse Gravel, Slag, angular, some vitrious, porous, medium plasticity, moist, medium dense, trace Organics (Fill)	(0.5-1.5') 0 ppm		(0.5-1.5')	1268 / 0 / 74 counts per minute
	2.0		(1.5-2.5') 0 ppm		(1.5-2.5')	1182 / 3 / 53 counts per minute
	3.0	(3') SLAG at interface (Fill) (3-5') Red brown TILL, moist, dense, oxidation at 3-3.5', possible top of former soil horizon (Clay and Silt, some medium-coarse Gravel)	(2.5-5') 0 ppm			
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **Hotspot #6**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**	SHEET 1 OF 1 SHEETS
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**	
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: **12-14-18**	11. DATE COMPLETED: **12-14-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **2.2 ft bgs**	
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**	
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**	

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90** %

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.6') Dark brown SILT and CLAY, some Organics, moist, soft, nonplastic (0.6-0.8') Grey, blue grey, SLAG, medium-coarse Gravel in size, dense, dry (Fill)	(0-0.5') 0 ppm	NA	(0-0.5')	3624 / 2 / 364 counts per minute
	1.0	(0.8-1.2') Brown SILT and SLAG (Fill), some Clay, moist, trace Organics, medium dense (1.2-2.3') Red brown SILT and CLAY, moist, soft, some Orgnics (Fill)	(0.5-1.5') 0 ppm		(0.5-1.5')	16372 / 24 / 1972 counts per minute
	2.0	(2.3-5') Red brown TILL, medium dense to dense, moist to dry (Silt and Clay, some fine-coarse Gravel)	(1.5-2.5') 0 ppm		(1.5-2.5')	1493 / 3 / 120 counts per minute
	3.0		(2.5-5') 0 ppm			
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **Hotspot #7**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-17-18** / 11. DATE COMPLETED: **12-17-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90** %

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-1.4') Dark brown SILT and SLAY, some Slag, crushed Stone, medium-coarse Gravel in size, angular, little Organics, moist, medium dense (Fill)	(0-0.5') 0 ppm	NA	(0-0.5')	1489 / 0 / 156 counts per minute
	1.0		(0.5-1.5') 0 ppm		(0.5-1.5')	1291 / 1 / 98 counts per minute
		(1.4-1.6') Dark grey CLAY, some Silt, medium dense, moist, medium plasticity (Fill)				
	2.0	(1.6-5') Red brown SILT and medium-coarse GRAVEL, Slag, some Clay, little Organics, moist, medium dense, Slag is blue-grey, angular and porous (Fill), Slag in sampling shoe	(1.5-2.5') 0 ppm		(1.5-2.5')	1203 / 1 / 64 counts per minute
			(2.5-5') 0 ppm			
	3.0					
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **Hotspot #8**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**
	9. SURFACE ELEVATION:
	10. DATE STARTED: **12-17-18** / 11. DATE COMPLETED: **12-17-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **2.6 ft bgs**
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90** %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.2') Black SILT and CLAY, some Organics, wet, very soft (Fill)	(0-0.5') 0 ppm	NA	(0-0.5')	1116 / 0 / 77 counts per minute
		(0.2-0.5') Black SILT and medium-coarse GRAVEL, angular, some Organics, wet, medium dense (Fill)				
		(0.5-1.1') Red brown CLAY and SILT, moist to dry, not uniform, dense (Fill)	(0.5-1.5') 0 ppm		(0.5-1.5')	1041 / 1 / 79 counts per minute
	1.0	(1.1-1.7') Brown SILT, some Clay, little medium Gravel, rounded to subangular, medium dense, moist, nonplastic				
		(1.7-2') Dark brown SILT and fine SAND, little fine-medium Gravel, moist, soft, possible former topsoil horizon	(1.5-2.5') 0 ppm		(1.5-2.5')	1089 / 0 / 37 counts per minute
	2.0	(2-2.5') Light brown fine SAND and SILT, wet, dense, slow dilatancy				
		(2.5-2.6') Red brown CLAY lense	(2.5-5') 0 ppm			
		(2.6-3.7') Red brown fine SAND, some Silt, wet, slow to rapid dilatancy				
	3.0					
	4.0	(3.7-4.5') Dark red brown fine- medium SAND, little Silt, wet, rapid dilatancy				
	5.0	(4.5-5') Red brown TILL, moist, very dense, low plasticity (Clay and Silt and some medium-coarse Gravel)				
		EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

HTW DRILLING LOG

HOLE NO. **Hotspot #9**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**	SHEET 1 OF 1 SHEETS
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**	
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: **12-17-18**	11. DATE COMPLETED: **12-17-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**	
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **2.1 ft bgs**	
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**	

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90** %

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-1') Grey, blue-grey, SLAG and black SILT, some Clay, little Organics, dense wet (Fill)	(0-0.5') 0 ppm	NA	(0-0.5')	1373 / 0 / 90 counts per minute
	1.0	(1-2') Red brown SILT and fine SAND, little fine Gravel, trace Organics, soft to medium dense, moist to dry, nonplastic (Fill)	(0.5-1.5') 0 ppm		(0.5-1.5')	2148 / 0 / 57 counts per minute
	2.0	(2-2.1') Grey crushed STONE, angular (Fill) (2.1-2.5') Light brown, fine SAND and SILT, moist to wet, medium dense to soft, no dilatancy	(1.5-2.5') 0 ppm		(1.5-2.5')	1108 / 1 / 19 counts per minute
	3.0	(2.5-5') Light brown, fine SAND and SILT, wet, rapid dilatancy, soft to medium dense with depth	(2.5-5') 0 ppm			
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
JUN 89

HTW DRILLING LOG

HOLE NO. **Hotspot #10**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**	SHEET 1 OF 1 SHEETS
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**	
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: **12-17-18**	11. DATE COMPLETED: **12-17-18**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**	
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**	
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**	

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90** %

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.5') Dark brown SILT and fine SAND, some Clay, some Organics (roots, wood), little coarse Gravel (Fill)	(0-0.5') 0 ppm	NA	(0-0.5')	1045 / 1 / 144 counts per minute
	1.0	(0.5-1.3') Dark brown SILT and CLAY, some fine Sand, little Organics, trace medium Gravel, Organics at 1.3' (possible former topsoil), moist, medium dense	(0.5-1.5') 0 ppm		(0.5-1.5')	1139 / 1 / 136 counts per minute
	2.0	(1.3-1.8') Red brown, mottled grey CLAY, some medium-coarse Gravel, moist, medium dense	(1.5-2.5') 0 ppm		(1.5-2.5')	1150 / 1 / 158 counts per minute
	3.0	(1.8-3.6') Red brown TILL, Organics at 1.8', black to red brown, moist, dense	(2.5-5') 0 ppm			
	4.0	(3.6-4.2') Red brown, fine SAND, some Silt, moist, medium dense				
	5.0	(4.2-5') TILL, red brown, fine SAND, some Silt, moist, medium dense				
	6.0	EOB at 5'				

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

MRK FORM 55
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HTW DRILLING LOG

HOLE NO. **Hotspot-11**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**	SHEET 1 OF 1 SHEETS
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**	
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: **1-23-19**	11. DATE COMPLETED: **1-23-19**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **NA**	
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**	
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**	

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.7') Dark brown CLAY and ORGANICS, little medium Gravel/ Slag, black vitreous (glass-like), very soft, wet (fill)	(0-0.5') 0 ppm	NA	(0-0.5')	1620 / 1 / 152 counts per minute
	1.0	(0.7-1.7') Red brown SILT and CLAY, some fine Sand, moist medium dense, trace Organics	(0.5-1.5') 0 ppm		(0.5-1.5')	1470 / 0 / 67 counts per minute
	2.0	(1.7') Possible former surface of soil horizon (1.7-2') Red brown CLAY and SILT, little Organics (roots), moist medium dense (2-5') Red brown TILL, Silt and Clay, some fine-coarse Gravel, moist to dry, dense to very dense with depth	(1.5-2.5') 0 ppm (2.5-5') 0 ppm		(1.5-2.5')	1443 / 3 / 84 counts per minute
	3.0					
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

HTW DRILLING LOG

HOLE NO. **Hotspot-12**

1. COMPANY NAME: **Arcadis**	2. DRILLING SUBCONTRACTOR: **Arcadis**	SHEET 1 OF 1 SHEETS
3. PROJECT: **Niagara Falls Storage Site–Vicinity Property H Prime**	4. LOCATION: **Lewiston, NY**	
5. NAME OF DRILLER: **Doug Richmond**	6. MANUFACTURER'S DESIGNATION OF DRILL: **Track-Mounted AMS 9520 VTR PowerProbe Direct-Push Rig**	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: **- Direct Push/Percussion Rig; -3.5-inch x 5-foot Long; Sampling Barrel containing; a 2.75-inch Disposable Liner**	8. HOLE LOCATION: **Northwest portion of investigation area, North of M Street**	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: **1-23-19**	11. DATE COMPLETED: **1-23-19**
12. OVERBURDEN THICKNESS: **> 5 ft**	15. DEPTH GROUNDWATER ENCOUNTERED: **4.8 feet bgs**	
13. DEPTH DRILLED INTO ROCK: **None**	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: **NA (dry after drilling)**	
14. TOTAL DEPTH OF HOLE: **5 ft bgs**	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): **NA**	

18. GEOTECHNICAL SAMPLES:	DISTURBED:	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES:
None	**NA**	**NA**	**NA**

20. SAMPLES FOR CHEMICAL ANALYSIS:	VOC	METALS	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3 samples			Iso Pu, Iso U, Iso Th, Ra226, Ra228, Cs137, Sr90	**90 %**

22. DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. NAME OF GEOLOGIST
Backfilled	**Bentonite Grout**			**Jeff Brayer**

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	PID	GEOTECH SAMPLE	ANALYTICAL SAMPLE NO.	GAMMA/ALPHA/BETA READINGS
	0.0	(0-0.6') Dark brown CLAY and SILT, some Organics (roots), very soft, wet	(0-0.5') 0 ppm	NA	(0-0.5')	3048 / 2 / 355 counts per minute
		(0.6') Possible former top of soil horizon, Organics at interface				
		(0.6-1.2') Red brown TILL, Clay and Silt, some medium-coarse Gravel, angular, dense, moist	(0.5-1.5') 0 ppm		(0.5-1.5')	1451 / 1 / 103 counts per minute
	1.0					
		(1.2-5') Red brown TILL, Clay and Silt, some medium-coarse Gravel, angular, dense to very dense, moist to dry with depth	(1.5-2.5') 0 ppm		(1.5-2.5')	1307 / 1 / 103 counts per minute
	2.0					
			(2.5-5') 0 ppm			
	3.0					
	4.0					
	5.0	EOB at 5'				
	6.0					

Soils described by Arcadis. Soil samples screened, collected and submitted by AAR

APPENDIX B
WELL DEVELOPMENT LOGS

GROUNDWATER SAMPLING LOG / Well Development

Site: VP-II-Prime Client: ACOE Event: Remedial Investigation

Sampling Personnel: ARIADES - J. Baier Well ID: C1-20-BP3
Client / Job Number: W912QR-12-R-0061 Date: 11-27-18
Weather: Snowing Time In: 10:00 Time Out: 11:35

Well Information

Depth to Water:	4.58	(feet TIC)
Total Depth:	14.57	(feet TIC)
Length of Water Column:	9.99	(feet)
Volume of Water in Well:	1.62	(gal)
Screen Interval:	2.5-12.5	(feet) (from surface)
Depth to pump Intake:	12.0	(feet TIC)

Well Type:	Flushmount	(Stick-Up)	
Well Material:	Stainless Steel	(PVC)	
Well Locked:	Yes	(No)	
Measuring Point Marked:	Yes	(No)	(Highest point)
Well Diameter:	1"	(2")	Other:

Purging Information

Purging Method:	Bailer	(Peristaltic)	Bladder	Other:
Tubing/Bailer Material:	St. Steel	(HD Polyethylene)	Teflon	Other:
Sampling Method:	Bailer	Peristaltic	Bladder	Other: N/A
Duration of Pumping:	55 (min)			
Average Pumping Rate:	(ml/min)	Water-Quality Meter Type:	YSI/Lamotte 2020	
Total Volume Removed:	6.0 (gal)	Did well go dry:	Yes	(No)

Conversion Factors				
gal / ft. of water	1" ID	2" ID	4" ID	6" ID
	0.041	0.163	0.653	1.469
1 gal = 3.785 L = 3785 ml = 0.1337 cubic feet				

Unit Stability			
pH	DO	Cond.	ORP
±0.1	± 10%	± 3.0%	± 10 mV

Parameter:	1	2	3	4	5	6	7	8	9	10	11	12	13
	10:20	10:25	10:30	10:35	10:40	10:45	10:50	10:55	11:00	11:05	11:10	11:15	
Volume Purged (gal)	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.00	4.5	5.0	5.5	6.0	
Rate (mL/min)	400	400	400	400	400	400	400	400	400	400	400	400	
Depth to Water (ft.)	4.58	5.96	6.05	6.25	6.50	7.03	7.42	7.81	7.93	8.01	8.20	8.37	
pH	7.66	7.38	7.36	7.35	7.31	7.28	7.24	7.22	7.21	7.20	7.20	7.21	
Temp. (C)	~~7.3~~ 7.90	8.8	8.8	8.8	8.9	9.0	9.2	9.5	9.7	9.9	9.8	9.9	
Conductivity (mS/cm)	0.471	0.457	0.457	0461	0.474	0491	0.538	0540	0.538	0533	0544	0.540	
Dissolved Oxygen (mg/l)	5.15	4.81	4.61	4.58	4.61	4.64	4.66	4.68	4.72	4.43	4.21	3.99	
ORP (mV)	175.9	186.3	186.8	187.0	~~188.3~~ 187.3	188.0	188.2	188.6	190.3	191.4	192.4	192.8	
Turbidity (NTU)	16.5	14.13	14.3	9.24	6.04	4.44	7.39	11.91	6.62	10.44	12.87	11.20	
Notes:													

Sampling Information

Analyses	#	Laboratory
TCL VOC	3	Buffalo-Test America
TCL SVOC	2	Buffalo-Test America
TAL Metals	1	Buffalo-Test America
Total Cn	1	Buffalo-Test America
Free Cn	1	Buffalo-Test America
Sample ID:		Sample Time:
MS/MSD:	~~Yes~~	No
Duplicate:	~~Yes~~	No
Duplicate ID		Dup. Time:
Chain of Custody Signed By:	N/A	

Problems / Observations

Initial Purge: Clear

Final Purge: Clear - No odor

Notes: Removed 6 tot

- Tubing found in well. Not compatible w/ current pump set up. Removed tubing and used HDPE Tubing for development

GROUNDWATER SAMPLING LOG/ Well Development

Site: VP-H-Prime	Client: ACOE	11-27-18 **Event:**	Remedial Investigation
Sampling Personnel:	ARCADIS - J. Baier	**Well ID:**	~~C1-2-4~~ C1-2-A100BP4
Client / Job Number:	W912QR-17-0061	**Date:**	11-27-18
Weather:	Snow - Cold 25°	**Time In:** 12:15	**Time Out:** 13:30

Well Information

Depth to Water:	11.72	(feet TIC)
Total Depth:	17.39	(feet TIC)
Length of Water Column:	5.67	(feet)
Volume of Water in Well:	0.92	(gal)
Screen Interval:	4.7-14.7	(feet) (from surface)
Depth to pump Intake:	16.5-17	(feet TIC)

Well Type:	Flushmount	(Stick-Up)
Well Material:	Stainless Steel	(PVC)
Well Locked:	Yes	(No)
Measuring Point Marked:	Yes	(No) High point
Well Diameter:	1"	(2") Other:

Purging Information

Purging Method:	Bailer	(Peristaltic)	Bladder	Other:
Tubing/Bailer Material:	St. Steel	(HD Polyethylene)	Teflon	Other:
Sampling Method:	Bailer	Peristaltic	Bladder	Other: NA
Duration of Pumping:	50 (min)			
Average Pumping Rate:	(ml/min)	Water-Quality Meter Type:	YSI/Lamotte 2020	
Total Volume Removed:	4.25 (gal)	Did well go dry:	Yes	(No)

Conversion Factors

gal / ft. of water	1" ID	2" ID	4" ID	6" ID
	0.041	0.163	0.653	1.469

1 gal = 3.785 L =3785 ml = 0.1337 cubic feet

Unit Stability

pH	DO	Cond.	ORP
±0.1	± 10%	± 3.0%	± 10 mV

Parameter:	1	2	3	4	5	6	7	8	9	10	11	12	13
	12:30	12:35	12:40	12:45	12:50	12:55	13:00	13:05	13:10	13:15	13:20		
Volume Purged (gal)	0	0.25	1.00	2.00	2.25	3.00	3.25	3.50	3.75	4.00	4.25		
Rate (mL/min)	~~11.72~~ 250	250	500	400	400	400	300	300	300	300	300		
Depth to Water (ft.)	11.72	12.45	13.49	14.45	~~14.65~~ 15.96	16.09	16.49	16.95	16.75	16.81	16.83		
pH	6.97	6.92	6.82	6.90	6.84	6.79	6.74	6.73	6.72	6.72	6.72		
Temp. (C)	11.6	11.6	11.7	11.7	11.8	11.8	11.5	11.5	11.5	11.5	11.5		
Conductivity (mS/cm)	4.02	3.99	3.92	3.85	3.87	3.98	4.10	4.14	4.18	4.19	4.20		
Dissolved Oxygen (mg/l)	1.19	1.38	5.08	5.75	2.30	0.43	0.53	0.46	0.49	0.52	0.54		
ORP (mV)	44.8	21.7	48.4	62.8	52.1	0.4	-4.1	-1.0	-0.8	-0.3	-0.4		
Turbidity (NTU)	10.10	11.34	7.24	9.13	11.58	11.26	11.1	11.4	11.5	11.4	10.8		
Notes:							WL below Tubing						

Sampling Information

Analyses	#	Laboratory
TCL VOC	3	Buffalo-Test America
TCL SVOC	2	Buffalo-Test America
TAL Metals	1	Buffalo-Test America
Total Cn	1	Buffalo-Test America
Free Cn	1	Buffalo-Test America
Sample ID:		Sample Time:
MS/MSD:	Yes	No
Duplicate:	Yes	No
Duplicate ID		Dup. Time:
Chain of Custody Signed By:	N/A	

Problems / Observations

Initial Purge: Clear

Final Purge: Slowed pump rate from initial to avoid over stressing the well

Notes: - Adjusted tubing depth to continue well development
- Found tubing in well - did not fit current pump. Used new HDPE tubing for well Devel.

GROUNDWATER SAMPLING LOG / Well Development

Site: VP-11-Prime **Client:** ACOE **Event:** Remedial Investigation

Sampling Personnel: ARCADIS - J Bixler **Well ID:** CL-2-BPL
Client / Job Number: W912QR-17-D011 **Date:** 11-27-18
Weather: SNOW - Cold 25 **Time In:** 14:30 **Time Out:** 15:30

Well Information

Depth to Water:	3.70	(feet TIC)
Total Depth:	20.12	(feet TIC)
Length of Water Column:	16.42	(feet)
Volume of Water in Well:	2.62	(gal)
Screen Interval:	8-18'	(feet) (from surface)
Depth to pump Intake:	16'	(feet TIC)

Well Type:	Flushmount	(Stick-Up)
Well Material:	Stainless Steel	(PVC)
Well Locked:	Yes	(No)
Measuring Point Marked:	Yes	(No) North
Well Diameter:	1"	(2") Other:

Purging Information

Purging Method:	Bailer	(Peristaltic)	Bladder	Other:
Tubing/Bailer Material:	St. Steel	(HDPE) Polyethylene	Teflon	Other:
Sampling Method:	Bailer	Peristaltic	Bladder	Other: N/A
Duration of Pumping:	420 (min)			
Average Pumping Rate:	(ml/min)	Water-Quality Meter Type:	YSI/Lamotte 2020	
Total Volume Removed:	4.0 (gal)	Did well go dry:	Yes	(No)

Conversion Factors				
gal/ ft. of water	1" ID	2" ID	4" ID	6" ID
	0.041	0.163	0.653	1.469
1 gal = 3.785 L =3785 ml = 0.1337 cubic feet				

Unit Stability			
pH	DO	Cond.	ORP
±0.1	± 10%	± 3.0%	± 10mV

Parameter:	1	2	3	4	5	6	7	8	9	10	11	12	13
	14:46	14:50	14:55	15:00 ~~14:55~~	15:05	15:10	15:15	15:20	15:25	~~15:30~~			
Volume Purged (gal)	0	0.5	1.0	1.50	2.0	2.5	3.0	3.5	4.0				
Rate (mL/min)	3500	400	400	400	400	400	400	400	400				
Depth to Water (ft.)	3.7	~~6.82~~	6.82	8.69	10.46	10.46	10.54	10.56	11.26				
pH	7.72	7.63	7.58	7.53	7.48	7.47	7.44	7.45	7.40				
Temp. (C)	9.7	9.6	9.5	11.4	11.9	11.8	11.7	11.6	11.7				
Conductivity (mS/cm)	1.61	1.59	1.57	1.56	1.54	1.46	1.36	1.35	1.42				
Dissolved Oxygen (mg/l)	8.37	8.05	7.78	7.72	7.73	8.38	8.63	8.67	8.43				
ORP (mV)	72.2	78.4	86.6	99.0	106.3	110.4	119.1	122.1	125.6				
Turbidity (NTU)	4.06	4.34	4.35	3.54	1.64	1.57	1.66	2.72	1.30				
Notes:													

Sampling Information

Analyses	#	Laboratory
TCL VOC	3	Buffalo-Test America
TCL SVOC	2	Buffalo-Test America
TAL Metals	1	Buffalo-Test America
Total Cn	1	Buffalo-Test America
Free Cn	1	Buffalo-Test America
Sample ID:		Sample Time:
MS/MSD:	Yes	No
Duplicate:	Yes	No
Duplicate ID		Dup. Time:
Chain of Custody Signed By:	N/A	

Problems / Observations

Initial Purge: Clear - No odors

Final Purge:

Notes: Removed 4 gal
- Removed tubing that was found in well
- Developed well w/ new HDPE Tubing Compatible w/ Pump

APPENDIX C
PONDED WATER SAMPLE COLLECTION LOGS

Sample Collection Data Sheet

Date (dd/mm/yy): 29/11/18	**Author (circle):** Ausbrooks Blain Melloy (Weir)
Temperature (deg F): 30	**Weather (circle):** Sunny (Cloudy) Rain Snow
Start Time (hh:mm): 0935	**End Time (hh:mm):** 0937
Sample Crew (circle): Ausbrooks (Melloy) Sampson (Weir) Weste (Toya) Brayer	
Sample Type: RI Soil (RI SW) RI GW IDW Oil IDW Soil/Sed IDW Water Other:	
Sample Location (circle): (VP H-Prime) NFSS Other:e	
Boring Location (# or NA):	
NaI Background (cpm):	**Instrument SN:**
Max NaI CPM: N/A	**Location:** 0-6" 6-18" 18-30" Other:e "
Alpha/Beta Background (cpm): 29/11/18 CPM	**Instrument SN:**
Alpha NetCPM at Hotspot:	**Beta Net CPM at Hotspot:**
PID SN:	**Bump Test Date:**
Highest PID reading (ppm):	**Location:** 0-6" 6-18" 18-30" Other "
Sample Source: Surface Water @ C1S2-03	
Sample Number: HP-SW-H-C1S2-03	**Bottle Number** 1 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: ARS-HPP-18-0028	**Storage Temp (circle):** < 6 deg C (NA)
Sample Source: Surface Water @ C1S2-03	
Sample Number: HP-SW-H-C1S2-03	**Bottle Number:** 2 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other:	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)e

Sample Collection Data Sheet

Date (dd/mm/yy): 29/11/18	**Author (circle):** Ausbrooks Blain Melloy (Weir)
Temperature (deg F): 30	**Weather (circle):** Sunny (Cloudy) Rain Snow
Start Time (hh:mm): 0940	**End Time (hh:mm):** 0944
Sample Crew (circle): Ausbrooks (Melloy) Sampson (Weir) West (Toya) Brayer	
Sample Type: RI Soil (RI SW) RI GW IDW Oil IDW Soil/Sed IDW Water Other:	
Sample Location (circle): (VP H-Prime) NFSS Other:	
Boring Location (# or NA):	
NaI Background (cpm):	**Instrument SN:**
Max NaI CPM: N/A 29/11/18 CRW	**Location:** 0-6' 6-18" 18-30" Othere "
Alpha/Beta Background (cpm):	**Instrument SN:**
Alpha NetCPM at Hotspot:	**Beta Net CPM at Hotspot:**
PID SN:	**Bump Test Date:**
Highest PID reading (ppm):	**Location:** 0-6" 6-18" 18-30" Other "

Sample Source: C152-03	
Sample Number: HP-SW-H-C152-03	**Bottle Number:** 3 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40ml	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source: C1-52-03	
Sample Number: HP-SW-H-C152-03	**Bottle Number:** 4 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other: ~~REG~~ CRW 29/11/18	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)

Sample Collection Data Sheet

Date (dd/mm/yy): 29/11/18	**Author (circle):** Ausbrooks Blain Melloy (Weir)
Temperature (deg F): 30	**Weather (circle):** Sunny (Cloudy) Rain Snow
Start Time (hh:mm): 0944	**End Time (hh:mm):** 0946
Sample Crew (circle): Ausbrooks (Melloy) Sampson (Weir) West (Toya) Brayer	
Sample Type: RI Soil (RI SW) RI GW IDW Oil IDW Soil/Sed IDW Water Other:	
Sample Location (circle): (VP H-Prime) NFSS Other:	
Boring Location (# or NA):	
Nal Background (cpm):	**Instrument SN:**
Max Nal CPM:	**Location:** 0-6" 6-18" 18-30" Other "
Alpha/Beta Background (cpm): N/A 11/29/18 CRW	**Instrument SN:**
Alpha NetCPM at Hotspot:	**Beta Net CPM at Hotspot:**
PID SN:	**Bump Test Date:**
Highest PID reading (ppm):	**Location:** 0-6" 6-18" 18-30" Other "
Sample Source: CIS2-03	
Sample Number: HP-SW-H-CIS2-03	**Bottle Number:** 5 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)
Sample Source: CIS2-03	
Sample Number: HP-SW-H-CIS2-03	**Bottle Number:** 6 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other:	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)

Sample Collection Data Sheet

Date (dd/mm/yy): 29/11/18	**Author (circle):** Ausbrooks Blain Melloy (Weir)
Temperature (deg F): 30	**Weather (circle):** Sunny (Cloudy) Rain Snow
Start Time (hh:mm): 0947	**End Time (hh:mm):** 0948
Sample Crew (circle): Ausbrooks (Melloy) Sampson (Weir) West (Toya) Brayer	
Sample Type: RI Soil (RI SW) RI GW IDW Oil IDW Soil/Sed IDW Water Other:	
Sample Location (circle): (VP H-Prime) NFSS Other:	
Boring Location (# or NA):	
Nal Background (cpm):	**Instrument SN:**
Max NalCPM: 29/11/18 N/A CRW	**Location:** 0-6" 6-18" 18-30" Othere "
Alpha/Beta Background (cpm):	**Instrument SN:**
Alpha NetCPM at Hotspot:	**Beta Net CPM at Hotspot:**
PID SN:	**Bump Test Date:**
Highest PID reading (ppm):	**Location:** 0-6" 6-18" 18-30" Other "

Sample Source: CIS2-03	
Sample Number: HP-SW-H-CIS2-03	**Bottle Number:** 7 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source: CIS2-03	
Sample Number: HP-SW-FIL-H-CIS2-03	**Bottle Number:** 1 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: NOT FILTERED TO BE FILTERED AT LAB	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mLe	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)

Sample Collection Data Sheet

Date (dd/mm/yy): 29/11/18	**Author (circle):** Ausbrooks Blain Melloy (Weir)
Temperature (deg F): 30	**Weather (circle):** Sunny (Cloudy) Rain Snow
Start Time (hh:mm): 0958	**End Time (hh:mm):** 0959
Sample Crew (circle): Ausbrooks (Melloy) Sampson (Weir) West (Toya) Brayer	
Sample Type: RI Soil (RI SW) RI GW IDW Oil IDW Soil/Sed IDW Water Other:	
Sample Location (circle): (VP H-Prime) NFSS Other:	
Boring Location (# or NA):	
NaI Background (cpm):	**Instrument SN:**
Max NaI CPM:	**Location:** 0-6" 6-18" 18-30" **Other** "
Alpha/Beta Background (cpm): 29/11/18 N/A CRW	**Instrument SN:**
Alpha NetCPM at Hotspot:	**Beta Net CPM at Hotspot:**
PID SN:	**Bump Test Date:**
Highest PID reading (ppm):	**Location:** 0-6" 6-18" 18-30" **Other** "
Sample Source: CIS2-03	
Sample Number: HP-SW-FIL-H-CIS2-03	**Bottle Number:** 2 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: NOT FILTERED, TO be Filtered at LAB	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)
Sample Source: CIS2-03	
Sample Number: HP-SW-FIL-H-CIS2-03	**Bottle Number:** 3 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: NOT Filtered, to be Filtered at LAB	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)

Sample Collection Data Sheet

Date (dd/mm/yy): 29/11/18	**Author (circle):** Ausbrooks Blain Melloy (Weir)
Temperature (deg F): 30	**Weather (circle):** Sunny (Cloudy) Rain Snow
Start Time (hh:mm): 1000	**End Time (hh:mm):** 1004
Sample Crew (circle): Ausbrooks (Melloy) Sampson (Weir) West (Toya) Brayer	
Sample Type: RI Soil (RI SW) RI GW IDW Oil IDW Soil/Sed IDW Water Other	
Sample Location (circle): (VP H-Prime) NFSS Other:	
Boring Location (# or NA):	
NaI Background (cpm):	**Instrument SN:**
Max NaI CPM: 29/11/18 N/A	**Location:** 0-6" 6-18" 18-30" Other "
Alpha/Beta Background (cpm): ICRW	**Instrument SN:**
Alpha NetCPM at Hotspot:	**Beta Net CPM at Hotspot:**
PID SN:	**Bump Test Date:**
Highest PID reading (ppm):	**Location:** 0-6" 6-18" 18-30" Other "

Sample Source: CIS2-03	
Sample Number: HP-SW-FIL-H-CIS2-03	**Bottle Number:** 4 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: NOT Filtered, to be Filtered at LAB	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source: CIS2-03	
Sample Number: HP-SW-FIL-H-CIS2-03	**Bottle Number:** 5 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: NOT Filtered, to be Filtered at LAB	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other:	
Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source: CIS2-03

Sample Number: HP-SW-FIL-H-CIS2-03 | Bottle Number: 6 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None

Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0028 | Storage Temp (circle): < 6 deg C (NA)

Sample Source: CIS2-03

Sample Number: HP-SW-FIL-H-CIS2-03 | Bottle Number: 7 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other:

Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0028 | Storage Temp (circle): < 6 deg C (NA)

Sample Source: CIS2-03

Sample Number: HP-SW-H-CIS2-03 | Bottle Number: 1 of 1

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG

Rad Analytes (circle): Iso Pu Iso U Iso Th Ra226 Ra228 Cs137 Sr90 Other: None

Chem Analytes (circle): Metals VOC (Alkalinity) (Anions) (TDS) TSS pH Cyanide O&G Phosphorous BOD Other:

Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0028 | Storage Temp (circle): (< 6 deg C) NA

Notes: 10FT West of Bare Point.
Slightly murky water, with thin ice layer Aprox. 1/4". Sample water skimmed from the top. Light debris floating in water
Coolers ARS-05 and ARS-02
Shipped 11/29/18

Sample Collection Data Sheet

Date (dd/mm/yy): 29/11/18	**Author (circle):** Ausbrooks Blain Melloy (Weir)
Temperature (deg F): 32	**Weather (circle):** Sunny (Cloudy) Rain Snow
Start Time (hh:mm): 1132	**End Time (hh:mm):** 1134
Sample Crew (circle): Ausbrooks (Melloy) Sampson (Weir) West (Toya) Brayer	
Sample Type: RI Soil (RI SW) RI GW IDW Oil IDW Soil/Sed IDW Water Other:	
Sample Location (circle): (VP H-Prime) NFSS Other:	
Boring Location (# or NA):	
NaI Background (cpm):	**Instrument SN:**
Max NaI CPM: 29/11/18 N/A 1 CRW	**Location:** 0-6" 6-18" 18-30" Other "
Alpha/Beta Background (cpm):	**Instrument SN:**
Alpha NetCPM at Hotspot:	**Beta Net CPM at Hotspot:**
PID SN:	**Bump Test Date:**
Highest PID reading (ppm):	**Location:** 0-6" 6-18" 18-30" Other "

Sample Source: CISI-04	
Sample Number: HP-SW-H-CISI-04	**Bottle Number:** 1 of 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source: CISI-04	
Sample Number: HP-SW-H-CISI-04	**Bottle Number:** 2 of 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)

Sample Collection Data Sheet

Date (dd/mm/yy): 29/11/18	**Author (circle):** Ausbrooks Blain Melloy (Weir)
Temperature (deg F): 32	**Weather (circle):** Sunny (Cloudy) Rain Snow
Start Time (hh:mm): 1134	**End Time (hh:mm):** 1137
Sample Crew (circle): Ausbrooks (Melloy) Sampson (Weir) West (Toya) Brayer	
Sample Type: RI Soil (RI SW) RI GW IDW Oi IDW Soil/Sed IDW Water Other:	
Sample Location (circle): (VP H-Prime) NFSS Other:	
Boring Location (# or NA): N/A	
NaI Background (cpm): 29/11/18	**Instrument SN:** CRW
Max NaI CPM: /	**Location: 0-6" 6-18" 18-30" Other "**
Alpha/Beta Background (cpm):	**Instrument SN:**
Alpha NetCPM at Hotspot:	**Beta Net CPM at Hotspot:**
PID SN:	**Bump Test Date:**
Highest PID reading (ppm):	**Location: 0-6" 6-18" 18-30" Other "**

Sample Source: C1 SI-04	
Sample Number: HP-SW-H-C1SI-04	**Bottle Number:** 3 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source: C1-SI-04	
Sample Number: HP-SW-H-C1SI-04	**Bottle Number:** 4 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)

Sample Collection Data Sheet

Date (dd/mm/yy): 29/11/18	**Author (circle):** Ausbrooks Blain Melloy (Weir)
Temperature (deg F): 32	**Weather (circle):** Sunny (Cloudy) Rain Snow
Start Time (hh:mm): 1137	**End Time (hh:mm):** 1140
Sample Crew (circle): Ausbrooks (Melloy) Sampson (Weir) West (Toya) Brayer	
Sample Type: RI Soil (RI SW) RI GW IDW Oil IDW Soil/Sed IDW Water Other:	
Sample Location (circle): (VP H-Prime) NFSS Other:	
Boring Location (# or NA):	
NaI Background (cpm): N/A	**Instrument SN:**
Max NaI CPM: 29/11/18 CRW	**Location:** 0-6" 6-18" 18-30" Other "
Alpha/Beta Background (cpm): /	**Instrument SN:**
Alpha NetCPM at Hotspot:	**Beta Net CPM at Hotspot:**
PID SN:	**Bump Test Date:**
Highest PID reading (ppm):	**Location:** 0-6" 6-18" 18-30" Other "

Sample Source: CISI-04	
Sample Number: HP-SW-H-CISI-04	**Bottle Number:** 5 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source: CISI-04	
Sample Number: HP-SW-H-CISI-04	**Bottle Number:** 6 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)

Sample Collection Data Sheet

Date (dd/mm/yy): 29/11/18	**Author (circle):** Ausbrooks Blain Melloy (Weir)
Temperature (deg F): 32	**Weather (circle):** Sunny (Cloudy) Rain Snow
Start Time (hh:mm): 1141	**End Time (hh:mm):** 1143
Sample Crew (circle): Ausbrooks (Melloy) Sampson (Weir) West (Toya) Brayer	
Sample Type: RI Soil (RI SW) RI GW IDW Oil IDW Soil/Sed IDW Water Other	
Sample Location (circle): (VP H-Prime) NFSS Other:	
Boring Location (# or NA):	
NaI Background (cpm):	**Instrument SN:**
Max NaI CPM: 29/11/18 N/A CRW	**Location: 0-6" 6-18" 18-30" Other** "
Alpha/Beta Background (cpm):	**Instrument SN:**
Alpha NetCPM at Hotspot:	**Beta Net CPM at Hotspot:**
PID SN:	**Bump Test Date:**
Highest PID reading (ppm):	**Location: 0-6" 6-18" 18-30" Other** "

Sample Source: CISI-04e	
Sample Number: HP-SW-H-CISI-04	**Bottle Number:** 7 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mLe	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source: CISI-04	
Sample Number: HP-SW-FIL-H-CISI-04	**Bottle Number:** 1 of 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mLe	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)

Sample Collection Data Sheet

Date (dd/mm/yy): 29/11/18	**Author (circle):** Ausbrooks Blain Melloy (Weir)
Temperature (deg F): 32	**Weather (circle):** Sunny (Cloudy) Rain Snow
Start Time (hh:mm): 1144	**End Time (hh:mm):** 1145
Sample Crew (circle): Ausbrooks (Melloy) Sampson (Weir) West (Toya) Brayer	
Sample Type: RI Soil (RI SW) RI GW IDW Oil IDW Soil/Sed IDW Water Other:	
Sample Location (circle): (VP H-Prime) NFSS Other:	
Boring Location (# or NA):	
NaI Background (cpm): N/A	**Instrument SN:**
Max NaI CPM: 29/11/18 CRW	**Location:** 0-6" 6-18" 18-30" Other "
Alpha/Beta Background (cpm): 1	**Instrument SN:**
Alpha NetCPM at Hotspot:	**Beta Net CPM at Hotspot:**
PID SN:	**Bump Test Date:**
Highest PID reading (ppm):	**Location:** 0-6" 6-18" 18-30" Other "

Sample Source: CISI-04	
Sample Number: HP-SW-FIL-H-CISI-04	**Bottle Number:** 2 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source: CISI-04	
Sample Number: HP-SW-FIL-H-CISI-04	**Bottle Number:** 3 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)

[redacted] 11/30/18

Sample Collection Data Sheet

Date (dd/mm/yy): 29/11/18	**Author (circle):** Ausbrooks Blain Melloy (Weir)
Temperature (deg F): 32	**Weather (circle):** Sunny (Cloudy) Rain Snow
Start Time (hh:mm): 1145	**End Time (hh:mm):** 1148
Sample Crew (circle): Ausbrooks (Melloy) Sampson (Weir) West (Toya) Brayer	
Sample Type: RI Soil (RI SW) RI GW IDW Oil IDW Soil/Sed IDW Water Other:	
Sample Location (circle): (VP H-Prime) NFSS Other:	
Boring Location (# or NA):	
NaI Background (cpm): N/A	**Instrument SN:**
Max NaI CPM: 29/11/18 CRW	**Location:** 0-6" 6-18" 18-30" Other "
Alpha/Beta Background (cpm): /	**Instrument SN:**
Alpha NetCPM at Hotspot:	**Beta Net CPM at Hotspot:**
PID SN:	**Bump Test Date:**
Highest PID reading (ppm):	**Location:** 0-6" 6-18" 18-30" Other "

Sample Source: CISI-04	
Sample Number: HP-SW-FIL-H-CISI-04	**Bottle Number:** 4 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source: CISI-04	
Sample Number: HP-SW-FIL-H-CISI-04	**Bottle Number:** 5 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source:

Sample Number: HP-SW-FIL-H-CIS1-04 **Bottle Number:** 6 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other:

Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: **Storage Temp (circle):** < 6 deg C NA

Sample Source: CIS1-04

Sample Number: HP-SW-FIL-H-CIS1-04 **Bottle Number:** 7 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other:

Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0028 **Storage Temp (circle):** < 6 deg C (NA)

Sample Source: CIS1-04

Sample Number: HP-SW-~~FIL~~ CRW 24hr Filt -H-CIS1-04 **Bottle Number:** 1 OF 1

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG

Rad Analytes (circle): Iso Pu Iso U Iso Th Ra226 Ra228 Cs137 Sr90 Other: None

Chem Analytes (circle): Metals VOC (Alkalinity) (Anions) (TDS) TSS pH Cyanide O&G Phosphorous BOD Other:

Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0028 **Storage Temp (circle):** (< 6 deg C) (NA) ICd 11/29/18

Notes: Sample Point has very thin layer of ice, Slightly Cloudy With Very Light debris. All Samples taken from Surface of standing Water Samples taken from Water in ditch, 5ft EAST from Bore Point - Cooler ARS-06 / ARS-02 Shipped 11/29/18

[redacted] /18

Sample Collection Data Sheet

Date (dd/mm/yy): 29/11/18	**Author (circle):** Ausbrooks Blain Melloy (Weir)
Temperature (deg F): 33	**Weather (circle):** Sunny (Cloudy) Rain Snow
Start Time (hh:mm): 1353	**End Time (hh:mm):** 1355
Sample Crew (circle): Ausbrooks (Melloy) Sampson (Weir) (West) (Toya)n Brayer	
Sample Type: RI Soil (RI SW) RI GW IDW Oil IDW Soil/Sed IDW Watern Other:	
Sample Location (circle): (VP H-Prime) NFSS Other:	
Boring Location (# or NA):n	
NaI Background (cpm):	**Instrument SN:**n
Max NaI CPM: N/A 29/11/18 CRW	**Location:** 0-6" 6-18" 18-30" Other "
Alpha/Beta Background (cpm):	**Instrument SN:**
Alpha NetCPM at Hotspot:	**Beta Net CPM at Hotspot:**
PID SN:	**Bump Test Date:**
Highest PID reading (ppm):	**Location:** 0-6" 6-18" 18-30" Other "n

Sample Source: CIS2-11	
Sample Number: HP-SW-H-CIS2-11	**Bottle Number:** 1 of 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:n	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PYn 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)n

Sample Source: CIS2-11	
Sample Number: HP-SW-H-CIS2-11	**Bottle Number:** 2 of 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:n	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide Nonen	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mLn	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)

Sample Collection Data Sheet

Date (dd/mm/yy): 29/11/18	**Author (circle):** Ausbrooks Blain Melloy (Weir)
Temperature (deg F): 33	**Weather (circle):** Sunny (Cloudy) Rain Snow
Start Time (hh:mm): 1355	**End Time (hh:mm):** 1357
Sample Crew (circle): Ausbrooks (Melloy) Sampson (Weir) (West) (Toya) Brayer	
Sample Type: RI Soil (RI SW) RI GW IDW Oil IDW Soil/Sed IDW Water Other:	
Sample Location (circle): (VP H-Prime) NFSS Other:	
Boring Location (# or NA):	
NaI Background (cpm): N/A	**Instrument SN:**
Max NaI CPM: 29/11/18 CRW	**Location:** 0-6" 6-18" 18-30" Other "
Alpha/Beta Background (cpm):	**Instrument SN:**
Alpha NetCPM at Hotspot:	**Beta Net CPM at Hotspot:**
PID SN:	**Bump Test Date:**
Highest PID reading (ppm):	**Location:** 0-6" 6-18" 18-30" Other "
Sample Source: CIS2-11	
Sample Number: HP-SW-H-CIS2-11	**Bottle Number:** 3 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)
Sample Source: CIS2-11	
Sample Number: HP-SW-H-CIS2-11	**Bottle Number:** 4 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)

Sample Collection Data Sheet

Date (dd/mm/yy): 29/11/18	**Author (circle):** Ausbrooks Blain Melloy (Weir)
Temperature (deg F): 33	**Weather (circle):** Sunny (Cloudy) Rain Snow
Start Time (hh:mm): 1357	**End Time (hh:mm):** 1359
Sample Crew (circle): Ausbrooks (Melloy) Sampson (Weir) (West) (Toya) Brayer	
Sample Type: RI Soil (RI SW) RI GW IDW Oi IDW Soil/Sed IDW Water Other:	
Sample Location (circle): (VP H-Prime) NFSS Other:	
Boring Location (# or NA):	
NaI Background (cpm): N/A	**Instrument SN:**
Max NaI CPM: 29/11/18 CRW	**Location:** 0-6" 6-18" 18-30" Other "
Alpha/Beta Background (cpm): /	**Instrument SN:**
Alpha NetCPM at Hotspot:	**Beta Net CPM at Hotspot:**
PID SN:	**Bump Test Date:**
Highest PID reading (ppm):	**Location:** 0-6" 6-18" 18-30" Other "

Sample Source: C1S2-11	
Sample Number: HP-SW-H-C1S2-11	**Bottle Number:** 5 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C NA

Sample Source: C1S2-11	
Sample Number: HP-SW-H-C1S2-11	**Bottle Number:** 6 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)

[redacted] 30/11/18

Sample Collection Data Sheet

Date (dd/mm/yy): 29/11/18	**Author (circle):** Ausbrooks Blain Melloy (Weir)
Temperature (deg F): 33	**Weather (circle):** Sunny Cloudy Rain Snow
Start Time (hh:mm): 1359	**End Time (hh:mm):** 1401
Sample Crew (circle): Ausbrooks (Melloy) Sampson (Weir) (West) (Toya) Brayer	
Sample Type: RI Soil (RI SW) RI GW IDW Oi IDW Soil/Sed IDW Water Other:	
Sample Location (circle): (VP H-Prime) NFSS Other:	
Boring Location (# or NA):	
NaI Background (cpm): N/A	**Instrument SN:**
Max NaI CPM: 29/11/18 CRW	**Location:** 0-6" 6-18" 18-30" Other "
Alpha/Beta Background (cpm):	**Instrument SN:**
Alpha NetCPM at Hotspot:	**Beta Net CPM at Hotspot:**
PID SN:	**Bump Test Date:**
Highest PID reading (ppm):	**Location:** 0-6" 6-18" 18-30" Other

Sample Source: C1S2-11	
Sample Number: HP-SW-H-C1S2-11	**Bottle Number:** 7 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source: C1S2-11	
Sample Number: HP-SW-FIL-H-C1S2-11	**Bottle Number:** 1 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)

Sample Collection Data Sheet

Date (dd/mm/yy): 29/11/18	**Author (circle):** Ausbrooks Blain Melloy (Weir)
Temperature (deg F): 33	**Weather (circle):** Sunny (Cloudy) Rain Snow
Start Time (hh:mm): 1402	**End Time (hh:mm):** 1403
Sample Crew (circle): Ausbrooks (Melloy) Sampson (Weir) (West) (Toya) Brayer	
Sample Type: RI Soil (RI SW) RI GW IDW Oil IDW Soil/Sed IDW Water Other:	
Sample Location (circle): (VP H-Prime) NFSS Other:	
Boring Location (# or NA):	
NaI Background (cpm): N/A	**Instrument SN:**
Max NaI CPM: 29/11/18 CRW	**Location:** 0-6" 6-18" 18-30" Other "
Alpha/Beta Background (cpm): 1	**Instrument SN:**
Alpha NetCPM at Hotspot:	**Beta Net CPM at Hotspot:**
PID SN:	**Bump Test Date:**
Highest PID reading (ppm):	**Location:** 0-6" 6-18" 18-30" Other "

Sample Source: CIS2-11	
Sample Number: HP-SW-FIL-H-CIS2-11	**Bottle Number:** 2 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source: CIS2-11	
Sample Number: HP-SW-FIL-H-CIS2-11	**Bottle Number:** 3 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)

Sample Collection Data Sheet

Date (dd/mm/yy): 29/11/18	**Author (circle):** Ausbrooks Blain Melloy (Weir)
Temperature (deg F): 33	**Weather (circle):** Sunny (Cloudy) Rain Snow
Start Time (hh:mm): 1403	**End Time (hh:mm):** 1405
Sample Crew (circle): Ausbrooks (Melloy) Sampson (Weir) (West) (Toya) Brayer	
Sample Type: RI Soil (RI SW) RI GW IDW Oi IDW Soil/Sed IDW Water Other:	
Sample Location (circle): (VP H-Prime) NFSS Other:	
Boring Location (# or NA):	
NaI Background (cpm): 29/11/18 N/A CRW	**Instrument SN:**
Max NaI CPM:	**Location:** 0-6" 6-18" 18-30" Other "
Alpha/Beta Background (cpm): /	**Instrument SN:**
Alpha NetCPM at Hotspot:	**Beta Net CPM at Hotspot:**
PID SN:	**Bump Test Date:**
Highest PID reading (ppm):	**Location:** 0-6" 6-18" 18-30" Other "
Sample Source: CIS2-11	
Sample Number: HP-SW-FIL-H-CIS2-11	**Bottle Number:** 4 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)
Sample Source:	
Sample Number: HP-SW-FIL-H-CIS2-11	**Bottle Number:** 5 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source: CIS2-11

Sample Number: HP-SW-FIL-H-CIS2-11 **Bottle Number:** 6 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None

Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mLd

Release Survey #: 18-0028 **Storage Temp (circle):** < 6 deg C (NA)

Sample Source: CIS2-11

Sample Number: HP-SW-FIL-H-CIS2-11 **Bottle Number:** 7 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None

Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mLd

Release Survey #: 18-0028 **Storage Temp (circle):** < 6 deg C (NA)

Sample Source: CIS2-11

Sample Number: HP-SW-H-CIS2-11 **Bottle Number:** 1 OF 1

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG

Rad Analytes (circle): Iso Pu Iso Ud Iso Th Ra226 Ra228 Cs137 Sr90 Other: None

Chem Analytes (circle): Metals VOC (Alkalinity) (Anions) (TDS) TSS pH Cyanide O&G Phosphorous BOD Other:

Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0028 **Storage Temp (circle):** (< 6 deg C) NA

Notes: Samples taken aprox. 12ft EAST of Bore Point. ~1/8" thicknes of ICE on surface, Samples taken from surface. Water is slightly Cloudy, No debris collected from Water Samples

Cooler AKS-04 and AKS-02

Shipped 11/29/18

Sample Collection Data Sheet

Date (dd/mm/yy): 29/11/18	**Author (circle):** Ausbrooks Blain Melloy (Weir)
Temperature (deg F): 34	**Weather (circle):** Sunny (Cloudy) Rain Snow
Start Time (hh:mm): 1452	**End Time (hh:mm):** 1454
Sample Crew (circle): Ausbrooks (Melloy) Sampson (Weir) (West) (Toya) Brayer	
Sample Type: RI Soil (RI SW) RI GW IDW Oil IDW Soil/Sed IDW Water Other:	
Sample Location (circle): (VP H-Prime) NFSS Other:	
Boring Location (# or NA):	
NaI Background (cpm): N/A 29/11/18 CRW	**Instrument SN:**
Max NaI CPM:	**Location:** 0-6" 6-18" 18-30" Other "
Alpha/Beta Background (cpm): /	**Instrument SN:**
Alpha NetCPM at Hotspot:	**Beta Net CPM at Hotspot:**
PID SN:	**Bump Test Date:**
Highest PID reading (ppm):	**Location:** 0-6" 6-18" 18-30" Other "

Sample Source: SW at C1S2-11	
Sample Number: HP-SW-H-C1S2-11	**Bottle Number:** 1 OF 7
Sample Subset (circle): Filtered (Duplicate) Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source: C1S2-11	
Sample Number: HP-SW-H-C1S2-11	**Bottle Number:** 2 OF 7
Sample Subset (circle): Filtered (Duplicate) Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)

Sample Collection Data Sheet

Date (dd/mm/yy): 29/11/18	**Author (circle):** Ausbrooks Blain Melloy (Weir)
Temperature (deg F): 34	**Weather (circle):** Sunny (Cloudy) Rain Snow
Start Time (hh:mm): 1454	**End Time (hh:mm):** 1455
Sample Crew (circle): Ausbrooks (Melloy) Sampson (Weir) (West) (Toya) Brayer	
Sample Type: RI Soil (RI SW) RI GW IDW Oi IDW Soil/Sed IDW Water Other:	
Sample Location (circle): (VP H-Prime) NFSS Other:	
Boring Location (# or NA):	
NaI Background (cpm): N/A	**Instrument SN:**
Max NaI CPM: 29/11/18 CRW	**Location:** 0-6" 6-18" 18-30" Other "
Alpha/Beta Background (cpm): /	**Instrument SN:**
Alpha NetCPM at Hotspot:	**Beta Net CPM at Hotspot:**
PID SN:	**Bump Test Date:**
Highest PID reading (ppm):	**Location:** 0-6" 6-18" 18-30" Other "

Sample Source: C1S2-11	
Sample Number: HP-SW-H-C1S2-11	**Bottle Number:** 3 OF 7
Sample Subset (circle): Filtered (Duplicate) Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40ml	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source: C1S2-11	
Sample Number: HP-SW-H-C1S2-11	**Bottle Number:** 4 OF 7
Sample Subset (circle): Filtered (Duplicate) Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)

Sample Collection Data Sheet

Date (dd/mm/yy): 29/11/18	**Author (circle):** Ausbrooks Blain Melloy (Weir)
Temperature (deg F): 34	**Weather (circle):** Sunny (Cloudy) Rain Snow
Start Time (hh:mm): 1455	**End Time (hh:mm):** 1456
Sample Crew (circle): Ausbrooks (Melloy) Sampson (Weir) (Wese) (Toya) Brayere	
Sample Type: RI Soil (RI SW) RI GW IDW Oil IDW Soil/Sed IDW Water Other:	
Sample Location (circle): (VP H-Prime) NFSS Other:	
Boring Location (# or NA):	
NaI Background (cpm): N/A	**Instrument SN:**
Max NaI CPM: 29/11/18 CRW	**Location:** 0-6" 6-18" 18-30" Othere "
Alpha/Beta Background (cpm): 1	**Instrument SN:**
Alpha NetCPM at Hotspot:	**Beta Net CPM at Hotspot:**
PID SN:	**Bump Test Date:**
Highest PID reading (ppm):	**Location:** 0-6" 6-18" 18-30" Other "

Sample Source: CIS2-11e	
Sample Number: HP-SW-H-CIS2-11	**Bottle Number:** 5 OF 7
Sample Subset (circle): Filtered (Duplicate) Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)e

Sample Source: CIS2-11	
Sample Number: HP-SW-H-CIS2-11	**Bottle Number:** 6 OF 7
Sample Subset (circle): Filtered (Duplicate) Field Blank Trip Blank Other: RFG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)e

[redacted] 1/30/18

Sample Collection Data Sheet

Date (dd/mm/yy): 29/11/18	**Author (circle):** Ausbrooks Blain Melloy (Weir)
Temperature (deg F): 34	**Weather (circle):** Sunny (Cloudy) Rain Snow
Start Time (hh:mm): 1456	**End Time (hh:mm):** 1457
Sample Crew (circle): Ausbrooks (Melloy) Sampson (Weir) (West) (Toya) Brayer	
Sample Type: RI Soil (RI SW) RI GW IDW Oil IDW Soil/Sed IDW Water Other:	
Sample Location (circle): (VP H-Prime) NFSS Other:	
Boring Location (# or NA):	
NaI Background (cpm): N/A	**Instrument SN:**
Max NaI CPM: 29/11/18 CRW	**Location:** 0-6" 6-18" 18-30" Other "
Alpha/Beta Background (cpm): 1	**Instrument SN:**
Alpha NetCPM at Hotspot:	**Beta Net CPM at Hotspot:**
PID SN:	**Bump Test Date:**
Highest PID reading (ppm):	**Location:** 0-6" 6-18" 18-30" Other "
Sample Source: CIS2-11	
Sample Number: HP-SW-H-CIS2-11	**Bottle Number:** 7 OF 7
Sample Subset (circle): Filtered (Duplicate) Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other:	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)
Sample Source: CIS2-11	
Sample Number: HP-SW-FIL-H-CIS2-11	**Bottle Number:** 1 OF 7
Sample Subset (circle): Filtered (Duplicate) Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)

[redacted] 30/18

Sample Collection Data Sheet

Date (dd/mm/yy): 29/11/18	**Author (circle):** Ausbrooks Blain Melloy (Weir)
Temperature (deg F): 34	**Weather (circle):** Sunny (Cloudy) Rain Snow
Start Time (hh:mm): 1457	**End Time (hh:mm):** 1459
Sample Crew (circle): Ausbrooks (Melloy) Sampson (Weir) (West) (Toya) Brayer	
Sample Type: RI Soil (RI SW) RI GW IDW Oil IDW Soil/Sed IDW Water Other:	
Sample Location (circle): (VP H-Prime) NFSS Other:	
Boring Location (# or NA):	
NaI Background (cpm): N/A	**Instrument SN:**
Max NaI CPM: 29/11/18 CRW	**Location: 0-6" 6-18" 18-30" Other** "
Alpha/Beta Background (cpm): /	**Instrument SN:**
Alpha NetCPM at Hotspot:	**Beta Net CPM at Hotspot:**
PID SN:	**Bump Test Date:**
Highest PID reading (ppm):	**Location: 0-6" 6-18" 18-30" Other** "
Sample Source: CIS2-11	
Sample Number: HP-SW-FIL-H-CIS2-11	**Bottle Number:** 2 OF 7
Sample Subset (circle): Filtered (Duplicate) Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)
Sample Source: CIS2-11	
Sample Number: HP-SW-FIL-H-CIS2-11	**Bottle Number:** 3 OF 7
Sample Subset (circle): Filtered (Duplicate) Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)

Sample Collection Data Sheet

Date (dd/mm/yy): 29/11/18	Author (circle): Ausbrooks Blain Melloy (Weir)
Temperature (deg F): 34	Weather (circle): Sunny (Cloudy) Rain Snow
Start Time (hh:mm): 1500	End Time (hh:mm): 1502
Sample Crew (circle): Ausbrooks (Melloy) Sampson (Weir) (West) (Toya) Brayer	
Sample Type: RI Soil (RI SW) RI GW IDW Oil IDW Soil/Sed IDW Water Other:	
Sample Location (circle): (VP H-Prime) NFSS Other:	
Boring Location (# or NA):	
NaI Background (cpm): N/A	Instrument SN:
Max NaI CPM: 29/11/18	Location: 0-6" 6-18" 18-30" Other "
Alpha/Beta Background (cpm): /	Instrument SN:
Alpha NetCPM at Hotspot:	Beta Net CPM at Hotspot:
PID SN:	Bump Test Date:
Highest PID reading (ppm):	Location: 0-6" 6-18" 18-30" Other "

Sample Source: CIS2-11	
Sample Number: HP-SW-FIL-H-CIS2-11	Bottle Number: 4 OF 7
Sample Subset (circle): Filtered (Duplicate) Field Blank Trip Blank Other: Not Filtered to be Filtered at LAB	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	Storage Temp (circle): < 6 deg C (NA)

Sample Source: CIS2-11	
Sample Number: HP-SW-FIL-H-CIS2-11	Bottle Number: 5 OF 7
Sample Subset (circle): Filtered (Duplicate) Field Blank Trip Blank Other: Not Filtred, to be Filtred at LAB	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	Storage Temp (circle): < 6 deg C (NA)

Sample Source: CIS2-11	
Sample Number: HP-SW-FTL-H-CIS2-11	**Bottle Number:** 6 OF 7
Sample Subset (circle): Filtered (Duplicate) Field Blank Trip Blank Other: Not Filtered to be Filtered at LAB	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source: CIS2-11	
Sample Number: HP-SW-FIL-H-CIS2-11	**Bottle Number:** 7 OF 7
Sample Subset (circle): Filtered (Duplicate) Field Blank Trip Blank Other: Not Filtered to be Filtered at LAB	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source: CIS2-11	
Sample Number: HP-SW-H-CIS2-11	**Bottle Number:** 1 OF 1
Sample Subset (circle): Filtered (Duplicate) Field Blank Trip Blank Other: REG	
Rad Analytes (circle): Iso Pu Iso U Iso Th Ra226 Ra228 Cs137 Sr90 Other: None	
Chem Analytes (circle): Metals VOC (Alkalinity) (Anions) (TDS) TSS pH Cyanide O&G Phosphorous BOD Other:	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0028	**Storage Temp (circle):** (< 6 deg C) NA

Notes: Samples taken aprox. 12ft EAST of Bare Point (same spot, Duplicate)
~1/8" Ice thickness on surface, Samples taken from surface Water is slightly Cloudy, no debris collected from water Samples
Cooler ARS-03 and ARS-02 / Shipped 11/29/18

Sample Collection Data Sheet

Date (dd/mm/yy): 30/11/18	**Author (circle):** Ausbrooks Blain Melloy (Weir)
Temperature (deg F): 32	**Weather (circle):** Sunny (Cloudy) Rain Snow
Start Time (hh:mm): 0815	**End Time (hh:mm):** 0845
Sample Crew (circle): Ausbrooks (Melloy) Sampson (Weir) (West) (Toya) Brayer	
Sample Type: RI Soil (RI SW) RI GW IDW Oi IDW Soil/Sed IDW Water Other:	
Sample Location (circle): (VP H-Prime) NFSS Other:	
Boring Location (# or NA):	
NaI Background (cpm): N/A 30/11/18 CRW	**Instrument SN:**
Max NaI CPM:	**Location:** 0-6" 6-18" 18-30" Other "
Alpha/Beta Background (cpm): /	**Instrument SN:**
Alpha NetCPM at Hotspot:	**Beta Net CPM at Hotspot:**
PID SN:	**Bump Test Date:**
Highest PID reading (ppm):	**Location:** 0-6" 6-18" 18-30" Other "
Sample Source: Water at CIS2-07	
Sample Number: HP-SW-H-CIS2-07	**Bottle Number:** 1 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other:	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0030	**Storage Temp (circle):** < 6 deg C (NA)
Sample Source: Water at CIS2-07	
Sample Number: HP-SW-H-CIS2-07	**Bottle Number:** 2 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (so Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other:	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0030	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source: Water at CIS2-07

Sample Number: HP-SW-H-CIS2-07 | Bottle Number: 3

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other:

Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0030 | Storage Temp (circle): < 6 deg C (NA)

Sample Source: Water at CIS2-07

Sample Number: HP-SW-H-CIS2-07 | Bottle Number: 4

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other:

Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0030 | Storage Temp (circle): < 6 deg C (NA)

Sample Source: Water at CIS2-07

Sample Number: HP-SW-H-CIS2-07 | Bottle Number: 5

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other:

Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: | Storage Temp (circle): < 6 deg C (NA)

Notes: Samples taken directly at Flagged bore Point. Aprox 1/4" Ice on surface of Water. NO Visible debris. Slightly murky

Cooler AKS-018

Shipped 11/30/18

[redacted] 11/30/18

Sample Source: Water at CIS2-07

Sample Number: HP-SW-H-CIS2-07 | Bottle Number: 6

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other:

Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0032 | Storage Temp (circle): < 6 deg C (NA)

Sample Source: Water at CIS2-07

Sample Number: HP-SW-H-CIS2-07 | Bottle Number: 7 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other:

Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0032 | Storage Temp (circle): < 6 deg C (NA)

Sample Source: Water at CIS2-07

Sample Number: HP-SW-H-CIS2-07 | Bottle Number: 1 OF 1

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG

Rad Analytes (circle): Iso Pu Iso U Iso Th Ra226 Ra228 Cs137 Sr90 Other:

Chem Analytes (circle): Metals VOC (Alkalinity) (Anions) (TDS) TSS pH Cyanide O&G Phosphorous BOD Other:

Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0032 | Storage Temp (circle): (< 6 deg C) NA

Notes: Samples taken directly at Flagged bore point. Aprox 1/4" Ice on Surface of Water No visible debris, Slightly murky

Cooler ARS-10/8

Shipped 11/30/18

[redacted] 11/30/18

Sample Source: Water at CIS2-07

Sample Number: HP-SW-FIL-H-CIS2-01 Bottle Number: 1 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other:

Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0030 Storage Temp (circle): < 6 deg C (NA)

Sample Source: Water at CIS2-07

Sample Number: HP-SW-FIL-H-CIS2-07 Bottle Number: 2 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other:

Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0030 Storage Temp (circle): < 6 deg C (NA)

Sample Source: Water at CIS2-07

Sample Number: HP-SW-FIL-H-CIS2-07 Bottle Number: 3 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other:

Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0030 Storage Temp (circle): < 6 deg C (NA)

Notes: Samples taken from bore point, AProx 1/4" Ice on Water surface. Samples taken from surface, slightly Murky with no visible debris

Cooler #ARS-10/8

Shipped 11/30/18

[redacted] 11/30/18

Sample Source: Water at CIS2-07

Sample Number: HP-SW-FIL-H-CIS2-07 | Bottle Number: 4 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other:

Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0030 | Storage Temp (circle): < 6 deg C (NA)

Sample Source: Water at CIS2-07

Sample Number: HP-SW-FIL-H-CIS2-07 | Bottle Number: 5 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other:

Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0030 | Storage Temp (circle): < 6 deg C (NA)

Sample Source: Water at CIS2-07

Sample Number: HP-SW-FIL-H-CIS2-07 | Bottle Number: 6 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other:

Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0030 | Storage Temp (circle): < 6 deg C (NA)

Notes: Samples taken at bore Point. Aprox ½" Ice on Water surface Where Water Was taken. Samples are slightly Murky/tinted With no visible debris

Cooler AKS - 10/8

Shipped 11/30/18

[redacted]

Sample Source:	Water at CIS2-07
Sample Number:	HP-SW-FIL-H-CIS2-07 **Bottle Number:** 7 OF 7
Sample Subset (circle):	Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB
Rad Analytes (circle):	(Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:
Chem Analytes (circle):	Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other:
Preservative (circle):	Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)
Bottle Type (circle):	Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL
Release Survey #:	18-0030 **Storage Temp (circle):** < 6 deg C (NA)

Sample Source:	
Sample Number:	**Bottle Number:**
Sample Subset (circle):	Filtered Duplicate Field Blank Trip Blank Other:
Rad Analytes (circle):	Iso Pu Iso U Iso Th Ra226 Ra228 Cs137 Sr90 Other:
Chem Analytes (circle):	Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other:
Preservative (circle):	Nitric Acid Hydrochloric Acid Sodium Hydroxide None
Bottle Type (circle):	Bag 1L-PY 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL
Release Survey #:	18-0030 **Storage Temp (circle):** < 6 deg C NA

Sample Source:	
Sample Number:	**Bottle Number:**
Sample Subset (circle):	Filtered Duplicate Field Blank Trip Blank Other:
Rad Analytes (circle):	Iso Pu Iso U Iso Th Ra226 Ra228 Cs137 Sr90 Other:
Chem Analytes (circle):	Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other:
Preservative (circle):	Nitric Acid Hydrochloric Acid Sodium Hydroxide None
Bottle Type (circle):	Bag 1L-PY 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL
Release Survey #:	18-0030 **Storage Temp (circle):** < 6 deg C NA

Notes: Samples taken from flagged Core Point, Aprox ¼" Ice on Surface where Water was Sampled from. Samples are Slightly Murky With no Visible debris

Cooler ARS-10/8

Shipped 11/30/18

11/28/2018 [redacted] 11/30/18

Sample Collection Data Sheet

Date (dd/mm/yy): 30/11/18	**Author (circle):** Ausbrooks Blain Melloy (Weir)
Temperature (deg F): 32	**Weather (circle):** Sunny Cloudy Rain (Snow)
Start Time (hh:mm): 0852	**End Time (hh:mm):** 0902
Sample Crew (circle): Ausbrooks (Melloy) Sampson (Weir) (West) (Toya) Brayer	
Sample Type: RI Soil (RI SW) RI GW IDW Oi IDW Soil/Sed IDW Water Other:	
Sample Location (circle): (VP H-Prime) NFSS Other:	
Boring Location (# or NA):	
NaI Background (cpm):	**Instrument SN:**
Max NaI CPM: N/A 30/11/18	**Location:** 0-6" 6-18" 18-30" Other "
Alpha/Beta Background (cpm): ICRW	**Instrument SN:**
Alpha NetCPM at Hotspot:	**Beta Net CPM at Hotspot:**
PID SN:	**Bump Test Date:**
Highest PID reading (ppm):	**Location:** 0-6" 6-18" 18-30" Other "

Sample Source: Water at CISI-10	
Sample Number: HP-SW-H-CISI-10	**Bottle Number:** 1 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0030	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source: Water at CISI-10	
Sample Number: HP-SW-H-CISI-10	**Bottle Number:** 2 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other:	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0030	**Storage Temp (circle):** < 6 deg C (NA)

[redacted] 30/18

Sample Source: Water at CISI-10	
Sample Number: HP-SW-H-CISI-10	**Bottle Number:** 3 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other: ~~R~~ CRW R3 11/18	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0030	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source: Water at CISI-10	
Sample Number: HP-SW-H-CISI-10	**Bottle Number:** 4 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0030	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source: Water at CISI-10	
Sample Number: HP-SW-H-CISI-10	**Bottle Number:** 5 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0030	**Storage Temp (circle):** < 6 deg C (NA)

Notes: Samples taken directly from Flagged Bore Point. Samples taken from surface after breaking through ~1/8" Ice layer. Slightly murky water, no visible debris

[redacted] 11/30/18

Sample Source: Water at CISI-10	
Sample Number: HP-SW-H-CISI-10	**Bottle Number:** 6 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0030	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source: Water at CISI-10	
Sample Number: HP-SW-H-CISI-10	**Bottle Number:** 7 of 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0030	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source: Water at CISI-10	
Sample Number: HP-SW-H-CISI-10	**Bottle Number:** 1 OF 1
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): Iso Pu Iso U Iso Th Ra226 Ra228 Cs137 Sr90 Other:	
Chem Analytes (circle): Metals VOC (Alkalinity) (Anions) (TDS) TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0030	**Storage Temp (circle):** (< 6 deg C) NA

Notes: Samples taken at bore point. Broke Aprox. 1/8" Ice to gather samples at water surface Samples slightly murky with no debris.

[redacted] 11/30/18

Sample Source: Water at CISI-10

Sample Number: HP-SW-FIL-H-CISI-10 | Bottle Number: 1 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None

Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0030 | Storage Temp (circle): < 6 deg C (NA)

Sample Source: Water at CISI-10

Sample Number: HP-SW-FIL-H-CISI-10 | Bottle Number: 2 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None

Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0030 | Storage Temp (circle): < 6 deg C (NA)

Sample Source: Water at CISI-10

Sample Number: HP-SW-FIL-H CISI-10 | Bottle Number: 3 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None

Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0030 | Storage Temp (circle): < 6 deg C (NA)

Notes: Samples gathered at Gore Point. Aprox 1/8' Ice on Surface where samples were gathered. Samples appear Slightly murky with no visible debris

Sample Source: Water at CISI-10

Sample Number: HP-SW-FIL-H-CISI-10 | Bottle Number: 4 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None

Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0030 | Storage Temp (circle): < 6 deg C (NA)

Sample Source: Water at CISI-10

Sample Number: HP-SW-FIL-H-CISI-10 | Bottle Number: 5 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None

Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0030 | Storage Temp (circle): < 6 deg C (NA)

Sample Source: Water at CISI-10

Sample Number: HP-SW-FIL-H-CISI-10 | Bottle Number: 6 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None

Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0030 | Storage Temp (circle): < 6 deg C (NA)

Notes: Water Samples taken at fore Point after breaking through ~1/8" ICE at Surface. Samples Collected at Surface, Water is murky with no debris.

[redacted] 1/30/18

Sample Source: Water at CISI-10	
Sample Number: HP-SW-FIL-H-CISI-10	**Bottle Number:** 7 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0030	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source:	
Sample Number:	**Bottle Number:**
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other:	
Rad Analytes (circle): Iso Pu Iso U Iso Th Ra226 Ra228 Cs137 Sr90 Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other:	
Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag 1L-PY 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40ml	
Release Survey #:	**Storage Temp (circle):** < 6 deg C NA

Sample Source:	
Sample Number:	**Bottle Number:**
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other:	
Rad Analytes (circle): Iso Pu Iso U Iso Th Ra226 Ra228 Cs137 Sr90 Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other:	
Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag 1L-PY 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #:	**Storage Temp (circle):** < 6 deg C NA

Notes: Samples collected at Core Point. Approx 1/8" Ice on surface where water was collected. Slightly murky with no visible debris.

Cooler #9 & 8

Shipped 11/30/18

[redacted]

Sample Collection Data Sheet

Date (dd/mm/yy): 30/11/18	**Author (circle):** Ausbrooks Blain Melloy (Weir)
Temperature (deg F): 32	**Weather (circle):** Sunny Cloudy Rain (Snow)
Start Time (hh:mm): 1051	**End Time (hh:mm):** 1108
Sample Crew (circle): Ausbrooks (Melloy) Sampson (Weir) (West) (Toya) Brayer	
Sample Type: RI Soil (RI SW) RI GW IDW Oil IDW Soil/Sed IDW Water Other:	
Sample Location (circle): (VP H-Prime) NFSS Other:	
Boring Location (# or NA):	
NaI Background (cpm):	**Instrument SN:**
Max NaI CPM: 30/11/18 CRW N/A	**Location:** 0-6' 6-18" 18-30" Other "
Alpha/Beta Background (cpm):	**Instrument SN:**
Alpha NetCPM at Hotspot:	**Beta Net CPM at Hotspot:**
PID SN:	**Bump Test Date:**
Highest PID reading (ppm):	**Location:** 0-6" 6-18" 18-30" Other "

Sample Source: Water at C2-11	
Sample Number: HP-SW-H-C2-11a	**Bottle Number:** 1 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0035	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source: Water at C2-11	
Sample Number: HP-SW-H-C2-11a	**Bottle Number:** 2 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0035	**Storage Temp (circle):** < 6 deg C (NA)

[redacted] 11/30/18

Sample Source: Water at C2-11

Sample Number: HP-SW-H-C2-11a | **Bottle Number:** 3 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None

Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL PY 40mL

Release Survey #: 18-0030 | **Storage Temp (circle):** < 6 deg C (NA)

Sample Source: Water at C2-11

Sample Number: HP-SW-H-C2-11a | **Bottle Number:** 4 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None

Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0030 | **Storage Temp (circle):** < 6 deg C (NA)

Sample Source: Water at C2-11

Sample Number: HP-SW-H-C2-11a | **Bottle Number:** 5 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None

Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0030 | **Storage Temp (circle):** < 6 deg C (NA)

Notes: Water Samples collected at bore Point. Aprox 1/8" Ice on surface, Water is Slightly ~~wi~~ murky With very light debris, minimized debris collection by sampling Water collected at surface

[redacted] 11/30/18

Sample Source: Water at C2-11	
Sample Number: HP-SW-H-C2-11a	**Bottle Number:** 6 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0030	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source: Water at C2-11	
Sample Number: HP-SW-H-C2-11a	**Bottle Number:** 7 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0030	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source: Water at C2-11	
Sample Number: HP-SW-H-C2-11a	**Bottle Number:** 1 OF 1
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): Iso Pu Iso U Iso Th Ra226 Ra228 Cs137 Sr90 Other:	
Chem Analytes (circle): Metals VOC (Alkalinity) (Anions) (TDS) TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0030	**Storage Temp (circle):** (< 6 deg C) NA

Notes: Samples collected at bare point. Water is slightly murky with very light organic debris. Aprox 1/8" Ice layer on top of Water

[redacted] 11/18

Sample Source: Water at C2-11

Sample Number: HP-SW-FIL-H-C2-11a | Bottle Number: 1 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None

Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0030 | Storage Temp (circle): < 6 deg C (NA)

Sample Source: Water at C2-11

Sample Number: HP-SW-FIL-H-C2-11a | Bottle Number: 2 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None

Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0030 | Storage Temp (circle): < 6 deg C (NA)

Sample Source: Water at C2-11

Sample Number: HP-SW-FIL-H-C2-11a | Bottle Number: 3 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None

Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0030 | Storage Temp (circle): < 6 deg C (NA)

Notes: Samples Collected at bore Point. Water is Slightly murky with very Light organic debris

[redacted]

Sample Source: Water at C2-11

Sample Number: ~~HP-SW-H-C2-11~~ 2/9/18 CRW HP-SW-FIL-H-C2-11a **Bottle Number:** 4 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None

Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0030 **Storage Temp (circle):** < 6 deg C (NA)

Sample Source: Water at C2-11

Sample Number: HP-SW-FIL-H-C2-11 **Bottle Number:** 5 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None

Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0030 **Storage Temp (circle):** < 6 deg C (NA)

Sample Source: Water at C2-11

Sample Number: HP-SW-FIL-H-C2-11 **Bottle Number:** 6 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None

Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0030 **Storage Temp (circle):** < 6 deg C (NA)

Notes: Water Samples Collected at Flagged Point Light Organic debris in Murky Water

[redacted] 2/30/18

Sample Source:	Water at C2-11
Sample Number: HP-SW-FIL-H-C2-11a	**Bottle Number:** 7 OF 7
Sample Subset (circle):	Filtered Duplicate Field Blank Trip Blank Other: Not Filtred, to be Filtered at LAB
Rad Analytes (circle):	(Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:
Chem Analytes (circle):	Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None
Preservative (circle):	Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)
Bottle Type (circle):	Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL
Release Survey #: 18-0030	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source:	
Sample Number:	**Bottle Number:**
Sample Subset (circle):	Filtered Duplicate Field Blank Trip Blank Other:
Rad Analytes (circle):	Iso Pu Iso U Iso Th Ra226 Ra228 Cs137 Sr90 Other:
Chem Analytes (circle):	Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other:
Preservative (circle):	Nitric Acid Hydrochloric Acid Sodium Hydroxide None
Bottle Type (circle):	Bag 1L-PY 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL
Release Survey #:	**Storage Temp (circle):** < 6 deg C NA

Sample Source:	
Sample Number:	**Bottle Number:**
Sample Subset (circle):	Filtered Duplicate Field Blank Trip Blank Other:
Rad Analytes (circle):	Iso Pu Iso U Iso Th Ra226 Ra228 Cs137 Sr90 Other:
Chem Analytes (circle):	Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other:
Preservative (circle):	Nitric Acid Hydrochloric Acid Sodium Hydroxide None
Bottle Type (circle):	Bag 1L-PY 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL
Release Survey #:	**Storage Temp (circle):** < 6 deg C NA

Notes: Samples collected at Core Point. Water is slightly murky with light organic debris and thin ice

Coolers ARS07 & 08

Shipped 11/30/18

[redacted]

Sample Collection Data Sheet

Date (dd/mm/yy): 30/11/18	**Author (circle):** Ausbrooks Blain Melloy (Weir)
Temperature (deg F): 32	**Weather (circle):** Sunny Cloudy Rain (Snow)
Start Time (hh:mm): 1110	**End Time (hh:mm):** 1124
Sample Crew (circle): Ausbrooks (Melloy) Sampson (Weir) (West) (Toya) Brayer	
Sample Type: RI Soil (RI SW) RI GW IDW Oi IDW Soil/Sed IDW Water Other:	
Sample Location (circle): (VP H-Prime) NFSS Other:	
Boring Location (# or NA):	
NaI Background (cpm): N/A	**Instrument SN:**
Max NaI CPM: 30/11/18 CRW	**Location:** 0-6" 6-18" 18-30" Other "
Alpha/Beta Background (cpm):	**Instrument SN:**
Alpha NetCPM at Hotspot:	**Beta Net CPM at Hotspot:**
PID SN:	**Bump Test Date:**
Highest PID reading (ppm):	**Location:** 0-6" 6-18" 18-30" Other "

Sample Source: Water at C2-10	
Sample Number: HP-SW-H-C2-10	**Bottle Number:** 1 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0030	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source: Water at C2-10	
Sample Number: HP-SW-H-C2-10	**Bottle Number:** 2 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0030	**Storage Temp (circle):** < 6 deg C (NA)

[redacted] 11/30/18

Sample Source: Water at C2-10	
Sample Number: HP-SW-H-C2-10	**Bottle Number:** 3 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-003	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source: Water at C2-10	
Sample Number: HP-SW-H-C2-10	**Bottle Number:** 4 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0030	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source: Water at C2-10	
Sample Number: HP-SW-H-C2-10	**Bottle Number:** 5 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0030	**Storage Temp (circle):** < 6 deg C (NA)

Notes: Samples gathered Aprox 10' EAST of Bore point. in ditch. No ice present. Some floating organics. Very Small scattered spots of Sheen Seen floating On Water. Light debris and slightly murky Water

[redacted] 11/30/18

Sample Source: Water at C2-10

Sample Number: HP-SW-H-C2-10 | Bottle Number: 6 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None

Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0030 | Storage Temp (circle): < 6 deg C (NA)

Sample Source: Water at C2-10

Sample Number: HP-SW-H-C2-10 | Bottle Number: 7 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None

Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0030 | Storage Temp (circle): < 6 deg C (NA)

Sample Source: Water at C2-10

Sample Number: HP-SW-H-C2-10 | Bottle Number: 1 OF 1

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other:

Rad Analytes (circle): Iso Pu Iso U Iso Th Ra226 Ra228 Cs137 Sr90 Other: None

Chem Analytes (circle): Metals VOC (Alkalinity) (Anions) (TDS) TSS pH Cyanide O&G Phosphorous BOD Other:

Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0030 | Storage Temp (circle): (< 6 deg C) NA

Notes: Water Samples collected aprox 10' EAST of bore point. Some floating organic debris in murky water
Small spots of scattered Sheen

[redacted] 11/30/18

Sample Source: Water at C2-10

Sample Number: HP-SW-FIL-H-C2-10 **Bottle Number:** 1 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None

Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0030 **Storage Temp (circle):** < 6 deg C (NA)

Sample Source: Water at C2-10

Sample Number: HP-SW-FIL-H-C2-10 **Bottle Number:** 2 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None

Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0030 **Storage Temp (circle):** < 6 deg C (NA)

Sample Source: Water at C2-10

Sample Number: HP-SW-FIL-H-C2-10 **Bottle Number:** 3 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None

Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0030 **Storage Temp (circle):** < 6 deg C (NA)

Notes: Samples collected ~10' EAST of Core Point Some floating organic debris in murky water. Very little spots of sheen on water surface

[redacted] 11/30/18

11/30/18

Sample Source: Water at C2-10

Sample Number: HP-SW-FIL-H-C2-10 **Bottle Number:** 4 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered to be Filtered at LAB

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None

Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0030 **Storage Temp (circle):** < 6 deg C (NA)

Sample Source: Water at C2-10

Sample Number: HP-SW-FIL-H-C2-10 **Bottle Number:** 5 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered to be Filtered at LAB

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None

Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0030 **Storage Temp (circle):** < 6 deg C (NA)

Sample Source: Water at C2-10

Sample Number: HP-SW-FIL-H-C2-10 **Bottle Number:** 6 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered to be Filtered at LAB

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None

Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0030 **Storage Temp (circle):** < 6 deg C (NA)

Notes: Water Samples gathered Aprx 10' EAST of Bore point. No Ice Present. Water is murky with Small amount of floating organic debris. Small of Spots of Sheen on Water Surface

[redacted] 11/30/18

Sample Source: Water at C2-10	
Sample Number: HPSW-FIL-HC2-10	**Bottle Number:** 7 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other:	Not Filtered to be Filtered at LAB
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0035	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source:	
Sample Number:	**Bottle Number:**
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other:	
Rad Analytes (circle): Iso Pu Iso U Iso Th Ra226 Ra228 Cs137 Sr90 Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other:	
Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag 1L-PY 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #:	**Storage Temp (circle):** < 6 deg C NA

Sample Source:	
Sample Number:	**Bottle Number:**
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other:	
Rad Analytes (circle): Iso Pu Iso U Iso Th Ra226 Ra228 Cs137 Sr90 Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other:	
Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag 1L-PY 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #:	**Storage Temp (circle):** < 6 deg C NA

Notes: Samples Gathered About 10' EAST of Bore-Point. Small amount of Sheen spots seen Scattered on Water Surface. Light amount of organic debris floating in murky water. All samples collected at Water Surface

Coolers ARC-11 and #8 / shipped 11/30/18

[redacted] 11/30/18

Sample Collection Data Sheet

Date (dd/mm/yy): 03/12/18	Author (circle): Ausbrooks Blain Melloy (Weir)
Temperature (deg F): 36	Weather (circle): Sunny Cloudy Rain (Snow)
Start Time (hh:mm): 1305	End Time (hh:mm): 1320
Sample Crew (circle): Ausbrooks (Melloy) Sampson (Weir) (West) (Toya) Brayer	
Sample Type: RI Soil (RI SW) RI GW IDW Oil IDW Soil/Sed IDW Water Other:	
Sample Location (circle): (VP H-Prime) NFSS Other:	
Boring Location (# or NA):	
NaI Background (cpm):	Instrument SN:
Max NaI CPM: ~~03/12/18~~ N/A	Location: 0-6" 6-18" 18-30" Other "
Alpha/Beta Background (cpm): ~~1 CRW~~	Instrument SN:
Alpha NetCPM at Hotspot:	Beta Net CPM at Hotspot:
PID SN:	Bump Test Date:
Highest PID reading (ppm):	Location: 0-6" 6-18" 18-30" Other "
Sample Source: Water at C2-08	
Sample Number: HP-SW-H-C2-08 1	Bottle Number: 1 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-00321	Storage Temp (circle): < 6 deg C (NA)
Sample Source: Water at C2-08	
Sample Number: HP-SW-H-C2-08	Bottle Number: 2 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mLI	
Release Survey #: 18-00322	Storage Temp (circle): < 6 deg C (NA)

Sample Source: Water at C2-08

Sample Number: HP-SW-H-C2-08 | Bottle Number: 3 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None

Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0032 | Storage Temp (circle): < 6 deg C (NA)

Sample Source: Water at C2-08

Sample Number: HP-SW-H-C2-08 | Bottle Number: 4 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None

Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0032 | Storage Temp (circle): < 6 deg C (NA)

Sample Source: Water at C2-08

Sample Number: HP-SW-H-C2-08 | Bottle Number: 5 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None

Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0032 | Storage Temp (circle): < 6 deg C (NA)

Notes: Water Samples collected Aprox. 30' SW of bore point. Water is Shallow and Slightly murky. Use of Cloth Filter Prevented organic debris from being collected With Water sample

Sample Source: Water at C2-08	
Sample Number: HP-SW-H-C2-08	**Bottle Number:** 6 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (IsoiPu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0032	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source: Water at C2-08	
Sample Number: HP-SW-H-C2-08	**Bottle Number:** 7 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other:	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0032	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source: Water at C2-08	
Sample Number: HP-SW-H-C2-08	**Bottle Number:** 1 OF 1
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): Iso Pu Iso U Iso Th Ra226 Ra228 Cs137 Sr90 Other: None	
Chem Analytes (circle): Metals VOC (Alkalinity) (Anions) (TDS) TSS pH Cyanide O&G Phosphorous BOD Other: None IC 12/3/18	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0032	**Storage Temp (circle):** (< 6 deg C) NA

Notes: Samples Collected Aprox. 30' SW of bore Point. Water is slightly murky with organic debris. Debris Was filtered from sample Water by a cloth Filter

Sample Source: Water at C2-08	
Sample Number: HP-SW-FIL-H-C2-08	**Bottle Number:** 1 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0032	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source: Water at C2-08	
Sample Number: HP-SW-FIL-H-C2-08	**Bottle Number:** 2 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0032	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source: Water at C2-08	
Sample Number: HP-SW-FIL-H-C2-08	**Bottle Number:** 3 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0032	**Storage Temp (circle):** < 6 deg C (NA)

Notes: Samples Collected Aprox. 30' SW from bore Point. Ground Water is murky with lots of Organic debris. Collection of debris prevented by use of cloth Filter.

Sample Source: Water at C2-08

Sample Number: HP-SW-FIL-H-C2-08 | Bottle Number: 4 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None

Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0032 | Storage Temp (circle): < 6 deg C (NA)

Sample Source: Water at C2-08

Sample Number: HP-SW-FIL-H-C2-08 | Bottle Number: 5 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None

Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0032 | Storage Temp (circle): < 6 deg C (NA)

Sample Source: Water at C2-08

Sample Number: HP-SW-FIL-H-C2-08 | Bottle Number: 6 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None

Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0032 | Storage Temp (circle): < 6 deg C (NA)

Notes: Collected Samples Approx. 30' SW of Bore Point. Water is Shallow and Murky with organic debris. Cloth filter used to prevent collection of debris in Sample bottles

Sample Source:	Water at C2-08	
Sample Number:	HPSW-FIL-H-C2-08	**Bottle Number:** 7 OF 7
Sample Subset (circle):	Filtered Duplicate Field Blank Trip Blank Other:	Not Filtered, to be Filtered at LAB
Rad Analytes (circle):	(Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle):	Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle):	Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)	
Bottle Type (circle):	Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #:	18-0032	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source:		
Sample Number:		**Bottle Number:**
Sample Subset (circle):	Filtered Duplicate Field Blank Trip Blank Other:	
Rad Analytes (circle):	Iso Pu Iso U Iso Th Ra226 Ra228 Cs137 Sr90 Other:	
Chem Analytes (circle):	Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other:	
Preservative (circle):	Nitric Acid Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle):	Bag 1L-PY 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #:		**Storage Temp (circle):** < 6 deg C NA

Sample Source:		
Sample Number:		**Bottle Number:**
Sample Subset (circle):	Filtered Duplicate Field Blank Trip Blank Other:	
Rad Analytes (circle):	Iso Pu Iso U Iso Th Ra226 Ra228 Cs137 Sr90 Other:	
Chem Analytes (circle):	Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other:	
Preservative (circle):	Nitric Acid Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle):	Bag 1L-PY 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #:		**Storage Temp (circle):** < 6 deg C NA

Notes: Samples collected Aprox. 30' SW of tore Point. Water is shallow and murky with organic debris. Cloth filter was used to prevent collection of large organic debris in sample bottles.

Cooler ARS-12

Shipped 12/3/18

Sample Source: Water at C2-08	
Sample Number: HP-SW-H-C2-08	**Bottle Number:** 6 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (IsoiPu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0032	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source: Water at C2-08	
Sample Number: HP-SW-H-C2-08	**Bottle Number:** 7 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other:	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0032	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source: Water at C2-08	
Sample Number: HP-SW-H-C2-08	**Bottle Number:** 1 OF 1
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: REG	
Rad Analytes (circle): Iso Pu Iso U Iso Th Ra226 Ra228 Cs137 Sr90 Other: None	
Chem Analytes (circle): Metals VOC (Alkalinity) (Anions) (TDS) TSS pH Cyanide O&G Phosphorous BOD Other: None IC 12/3/18	
Preservative (circle): (Nitric Acid) Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0032	**Storage Temp (circle):** (< 6 deg C) NA

Notes: Samples Collected Aprox. 30' SW of bore Point. Water is slightly murky with organic debris. Debris Was filtered from sample Water by a cloth Filter

Sample Source: Water at C2-08	
Sample Number: HP-SW-FIL-H-C2-08	**Bottle Number:** 1 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0032	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source: Water at C2-08	
Sample Number: HP-SW-FIL-H-C2-08	**Bottle Number:** 2 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0032	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source: Water at C2-08	
Sample Number: HP-SW-FIL-H-C2-08	**Bottle Number:** 3 OF 7
Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB	
Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)	
Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #: 18-0032	**Storage Temp (circle):** < 6 deg C (NA)

Notes: Samples Collected Aprox. 30' SW from bore Point. Ground Water is murky with lots of Organic debris. Collection of debris prevented by use of cloth Filter.

Sample Source: Water at C2-08

Sample Number: HP-SW-FIL-H-C2-08 | Bottle Number: 4 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None

Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0032 | Storage Temp (circle): < 6 deg C (NA)

Sample Source: Water at C2-08

Sample Number: HP-SW-FIL-H-C2-08 | Bottle Number: 5 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None

Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0032 | Storage Temp (circle): < 6 deg C (NA)

Sample Source: Water at C2-08

Sample Number: HP-SW-FIL-H-C2-08 | Bottle Number: 6 OF 7

Sample Subset (circle): Filtered Duplicate Field Blank Trip Blank Other: Not Filtered, to be Filtered at LAB

Rad Analytes (circle): (Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:

Chem Analytes (circle): Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None

Preservative (circle): Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)

Bottle Type (circle): Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL

Release Survey #: 18-0032 | Storage Temp (circle): < 6 deg C (NA)

Notes: Collected Samples Approx. 30' SW of Bore Point. Water is Shallow and Murky with organic debris. Cloth filter used to prevent collection of debris in Sample bottles

Sample Source:	Water at C2-08	
Sample Number:	HPSW-FIL-H-C2-08	**Bottle Number:** 7 OF 7
Sample Subset (circle):	Filtered Duplicate Field Blank Trip Blank Other:	Not Filtered, to be Filtered at LAB
Rad Analytes (circle):	(Iso Pu) (Iso U) (Iso Th) (Ra226) (Ra228) (Cs137) (Sr90) Other:	
Chem Analytes (circle):	Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other: None	
Preservative (circle):	Nitric Acid Hydrochloric Acid Sodium Hydroxide (None)	
Bottle Type (circle):	Bag (1L-PY) 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #:	18-0032	**Storage Temp (circle):** < 6 deg C (NA)

Sample Source:		
Sample Number:		**Bottle Number:**
Sample Subset (circle):	Filtered Duplicate Field Blank Trip Blank Other:	
Rad Analytes (circle):	Iso Pu Iso U Iso Th Ra226 Ra228 Cs137 Sr90 Other:	
Chem Analytes (circle):	Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other:	
Preservative (circle):	Nitric Acid Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle):	Bag 1L-PY 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #:		**Storage Temp (circle):** < 6 deg C NA

Sample Source:		
Sample Number:		**Bottle Number:**
Sample Subset (circle):	Filtered Duplicate Field Blank Trip Blank Other:	
Rad Analytes (circle):	Iso Pu Iso U Iso Th Ra226 Ra228 Cs137 Sr90 Other:	
Chem Analytes (circle):	Metals VOC Alkalinity Anions TDS TSS pH Cyanide O&G Phosphorous BOD Other:	
Preservative (circle):	Nitric Acid Hydrochloric Acid Sodium Hydroxide None	
Bottle Type (circle):	Bag 1L-PY 1L-AG 500mL-PY 250mL-PY 125mL-AG 125mL-PY 40mL	
Release Survey #:		**Storage Temp (circle):** < 6 deg C NA

Notes: Samples collected Aprox. 30' SW of tore Point. Water is shallow and murky with organic debris. Cloth filter was used to prevent collection of large organic debris in sample bottles.

Cooler ARS-12

Shipped 12/3/18

APPENDIX D
KAPL ANALYTICAL DATA

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S1-01	C1S1-01	C1S1-01	C1S1-02	C1S1-02
Field Sample Identifier		SO-H-C1S1-01-A	SO-H-C1S1-01-B	SO-H-C1S1-01-C	SO-H-C1S1-02-A	SO-H-C1S1-02-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/20/18	12/20/18
Parameter	Units					
RADIONUCLIDES						
CESIUM-137	PCI/G					
PLUTONIUM-238	PCI/G		R	0.044 J		
PLUTONIUM-239	PCI/G		R	0.106		
STRONTIUM-90	PCI/G					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S1-02	C1S1-03	C1S1-03	C1S1-03	C1S1-04
Field Sample Identifier		SO-H-C1S1-02-C	SO-H-C1S1-03-A	SO-H-C1S1-03-B	SO-H-C1S1-03-C	SO-H-C1S1-04-A
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5
Date of Sample		12/20/18	12/19/18	12/19/18	12/19/18	12/20/18
Parameter	Units					
RADIONUCLIDES						
CESIUM-137	PCI/G					
PLUTONIUM-238	PCI/G			R		
PLUTONIUM-239	PCI/G			R		
STRONTIUM-90	PCI/G					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S1-04	C1S1-04	C1S1-05	C1S1-05	C1S1-05
Field Sample Identifier		SO-H-C1S1-04-B	SO-H-C1S1-04-C	SO-H-C1S1-05-A	SO-H-C1S1-05-B	SO-H-C1S1-05-C
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5
Date of Sample		12/20/18	12/20/18	12/19/18	12/19/18	12/19/18
Parameter	Units					
RADIONUCLIDES						
CESIUM-137	PCI/G					
PLUTONIUM-238	PCI/G				R	
PLUTONIUM-239	PCI/G				R	
STRONTIUM-90	PCI/G					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S1-06	C1S1-06	C1S1-06	C1S1-06	C1S1-06
Field Sample Identifier		SO-H-C1S1-06-A	SO-H-C1S1-06-A-D	SO-H-C1S1-06-B	SO-H-C1S1-06-B-D	SO-H-C1S1-06-C
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-0.5	0.0-0.5	0.5-1.5	0.5-1.5	1.5-2.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units		Field Duplicate		Field Duplicate	
RADIONUCLIDES						
CESIUM-137	*PCI/G*					
PLUTONIUM-238	*PCI/G*	R			R	
PLUTONIUM-239	*PCI/G*	R			R	
STRONTIUM-90	*PCI/G*					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S1-06	C1S1-07	C1S1-07	C1S1-07	C1S1-08
Field Sample Identifier		SO-H-C1S1-06-C-D	SO-H-C1S1-07-A	SO-H-C1S1-07-B	SO-H-C1S1-07-C	SO-H-C1S1-08-A
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5
Date of Sample		12/19/18	12/20/18	12/20/18	12/20/18	12/20/18
Parameter	Units	Field Duplicate				
RADIONUCLIDES						
CESIUM-137	*PCI/G*					
PLUTONIUM-238	*PCI/G*			R		
PLUTONIUM-239	*PCI/G*			R		
STRONTIUM-90	*PCI/G*					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S1-08	C1S1-08	C1S1-09	C1S1-09	C1S1-09
Field Sample Identifier		SO-H-C1S1-08-B	SO-H-C1S1-08-C	SO-H-C1S1-09-A	SO-H-C1S1-09-B	SO-H-C1S1-09-C
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5
Date of Sample		12/20/18	12/20/18	12/19/18	12/19/18	12/19/18
Parameter	Units					
RADIONUCLIDES						
CESIUM-137	PCI/G					
PLUTONIUM-238	PCI/G					R
PLUTONIUM-239	PCI/G					R
STRONTIUM-90	PCI/G					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S1-10	C1S1-10	C1S1-10	C1S1-11	C1S1-11
Field Sample Identifier		SO-H-C1S1-10-A	SO-H-C1S1-10-B	SO-H-C1S1-10-C	SO-H-C1S1-11-A	SO-H-C1S1-11-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units					
RADIONUCLIDES						
CESIUM-137	PCI/G					
PLUTONIUM-238	PCI/G		0.519		R	R
PLUTONIUM-239	PCI/G		1.242		R	R
STRONTIUM-90	PCI/G					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S1-11	C1S1-12	C1S1-12	C1S1-12	C1S1-13
Field Sample Identifier		SO-H-C1S1-11-C	SO-H-C1S1-12-A	SO-H-C1S1-12-B	SO-H-C1S1-12-C	SO-H-C1S1-13-A
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/20/18
Parameter	Units					
RADIONUCLIDES						
CESIUM-137	PCI/G					
PLUTONIUM-238	PCI/G			R		
PLUTONIUM-239	PCI/G			R		
STRONTIUM-90	PCI/G					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S1-13	C1S1-13	C1S1-13	C1S1-13	C1S1-13
Field Sample Identifier		SO-H-C1S1-13-A-D	SO-H-C1S1-13-B	SO-H-C1S1-13-B-D	SO-H-C1S1-13-C	SO-H-C1S1-13-C-D
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-0.5	0.5-1.5	0.5-1.5	1.5-2.5	1.5-2.5
Date of Sample		12/20/18	12/20/18	12/20/18	12/20/18	12/20/18
Parameter	Units	Field Duplicate		Field Duplicate		Field Duplicate
RADIONUCLIDES						
CESIUM-137	*PCI/G*					
PLUTONIUM-238	*PCI/G*	R				R
PLUTONIUM-239	*PCI/G*	R			0.029	R
STRONTIUM-90	*PCI/G*					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S1-14	C1S1-14	C1S1-14	C1S2-01	C1S2-01
Field Sample Identifier		SO-H-C1S1-14-A	SO-H-C1S1-14-B	SO-H-C1S1-14-C	SO-H-C1S2-01-A	SO-H-C1S2-01-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units					
RADIONUCLIDES						
CESIUM-137	*PCI/G*					
PLUTONIUM-238	*PCI/G*	R			0.71 J-	
PLUTONIUM-239	*PCI/G*	R			0.531 J-	
STRONTIUM-90	*PCI/G*					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S2-01	C1S2-02	C1S2-02	C1S2-02	C1S2-03
Field Sample Identifier		SO-H-C1S2-01-C	SO-H-C1S2-02-A	SO-H-C1S2-02-B	SO-H-C1S2-02-C	SO-H-C1S2-03-A
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	0.0-0.5	0.5-1.5	4.0-5.0	0.0-0.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/21/18
Parameter	Units					
RADIONUCLIDES						
CESIUM-137	PCI/G					
PLUTONIUM-238	PCI/G			4.43 J-		
PLUTONIUM-239	PCI/G			9.116 J-		
STRONTIUM-90	PCI/G					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S2-03	C1S2-03	C1S2-04	C1S2-04	C1S2-04
Field Sample Identifier		SO-H-C1S2-03-B	SO-H-C1S2-03-C	SO-H-C1S2-04-A	SO-H-C1S2-04-A-D	SO-H-C1S2-04-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	1.5-2.5	0.0-0.5	0.0-0.5	0.5-1.5
Date of Sample		12/21/18	12/21/18	12/21/18	12/21/18	12/21/18
Parameter	Units				Field Duplicate	
RADIONUCLIDES						
CESIUM-137	*PCI/G*					
PLUTONIUM-238	*PCI/G*				R	
PLUTONIUM-239	*PCI/G*				R	
STRONTIUM-90	*PCI/G*					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S2-04	C1S2-04	C1S2-04	C1S2-05	C1S2-05
Field Sample Identifier		SO-H-C1S2-04-B-D	SO-H-C1S2-04-C	SO-H-C1S2-04-C-D	SO-H-C1S2-05-A	SO-H-C1S2-05-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	1.5-2.5	1.5-2.5	0.0-0.5	0.5-1.5
Date of Sample		12/21/18	12/21/18	12/21/18	12/19/18	12/19/18
Parameter	Units	Field Duplicate		Field Duplicate		
RADIONUCLIDES						
CESIUM-137	*PCI/G*					
PLUTONIUM-238	*PCI/G*					
PLUTONIUM-239	*PCI/G*					0.319
STRONTIUM-90	*PCI/G*					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S2-05	C1S2-06	C1S2-06	C1S2-06	C1S2-07
Field Sample Identifier		SO-H-C1S2-05-C	SO-H-C1S2-06-A	SO-H-C1S2-06-B	SO-H-C1S2-06-C	SO-H-C1S2-07-A
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5
Date of Sample		12/19/18	12/21/18	12/21/18	12/21/18	12/21/18
Parameter	Units					
RADIONUCLIDES						
CESIUM-137	*PCI/G*					
PLUTONIUM-238	*PCI/G*	R	R			
PLUTONIUM-239	*PCI/G*	R	R			
STRONTIUM-90	*PCI/G*					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S2-07	C1S2-07	C1S2-08	C1S2-08	C1S2-08
Field Sample Identifier		SO-H-C1S2-07-B	SO-H-C1S2-07-C	SO-H-C1S2-08-A	SO-H-C1S2-08-B	SO-H-C1S2-08-C
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5
Date of Sample		12/21/18	12/21/18	01/23/19	01/23/19	01/23/19
Parameter	Units					
RADIONUCLIDES						
CESIUM-137	PCI/G					
PLUTONIUM-238	PCI/G	R	R			
PLUTONIUM-239	PCI/G	R	R			
STRONTIUM-90	PCI/G					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S2-09	C1S2-09	C1S2-09	C1S2-10	C1S2-10
Field Sample Identifier		SO-H-C1S2-09-A	SO-H-C1S2-09-B	SO-H-C1S2-09-C	SO-H-C1S2-10-A	SO-H-C1S2-10-A-D
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5	0.0-0.5
Date of Sample		12/21/18	12/21/18	12/21/18	12/16/18	12/16/18
Parameter	Units					Field Duplicate
RADIONUCLIDES						
CESIUM-137	*PCI/G*					
PLUTONIUM-238	*PCI/G*					
PLUTONIUM-239	*PCI/G*					
STRONTIUM-90	*PCI/G*					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S2-10	C1S2-10	C1S2-10	C1S2-10	C1S2-11
Field Sample Identifier		SO-H-C1S2-10-B	SO-H-C1S2-10-B-D	SO-H-C1S2-10-C	SO-H-C1S2-10-C-D	SO-H-C1S2-11-A
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	0.5-1.5	1.5-2.5	1.5-2.5	0.0-0.5
Date of Sample		12/16/18	12/16/18	12/16/18	12/16/18	01/23/19
Parameter	Units		Field Duplicate		Field Duplicate	
RADIONUCLIDES						
CESIUM-137	*PCI/G*					
PLUTONIUM-238	*PCI/G*					
PLUTONIUM-239	*PCI/G*					
STRONTIUM-90	*PCI/G*					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S2-11	C1S2-11	C1S2-12	C1S2-12	C1S2-12
Field Sample Identifier		SO-H-C1S2-11-B	SO-H-C1S2-11-C	SO-H-C1S2-12-A	SO-H-C1S2-12-B	SO-H-C1S2-12-C
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5
Date of Sample		01/23/19	01/23/19	12/21/18	12/21/18	12/21/18
Parameter	Units					
RADIONUCLIDES						
CESIUM-137	PCI/G					
PLUTONIUM-238	PCI/G			R	R	
PLUTONIUM-239	PCI/G			R	R	
STRONTIUM-90	PCI/G					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S2-13	C1S2-13	C1S2-13	C1S2-14	C1S2-14
Field Sample Identifier		SO-H-C1S2-13-A	SO-H-C1S2-13-B	SO-H-C1S2-13-C	SO-H-C1S2-14-A	SO-H-C1S2-14-A-D
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5	0.0-0.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units					Field Duplicate
RADIONUCLIDES						
CESIUM-137	*PCI/G*					
PLUTONIUM-238	*PCI/G*		R			
PLUTONIUM-239	*PCI/G*		R			
STRONTIUM-90	*PCI/G*					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S2-14	C1S2-14	C1S2-14	C1S2-14	C1S2-15
Field Sample Identifier		SO-H-C1S2-14-B	SO-H-C1S2-14-B-D	SO-H-C1S2-14-C	SO-H-C1S2-14-C-D	SO-H-C1S2-15-A
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	0.5-1.5	1.5-2.5	1.5-2.5	0.0-0.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/20/18
Parameter	Units		Field Duplicate		Field Duplicate	
RADIONUCLIDES						
CESIUM-137	*PCI/G*					
PLUTONIUM-238	*PCI/G*					
PLUTONIUM-239	*PCI/G*					
STRONTIUM-90	*PCI/G*					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S2-15	C1S2-15	C1S2-16	C1S2-16	C1S2-16
Field Sample Identifier		SO-H-C1S2-15-B	SO-H-C1S2-15-C	SO-H-C1S2-16-A	SO-H-C1S2-16-A-D	SO-H-C1S2-16-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	1.5-2.5	0.0-0.5	0.0-0.5	0.5-1.5
Date of Sample		12/20/18	12/20/18	12/19/18	12/19/18	12/19/18
Parameter	Units				Field Duplicate	
RADIONUCLIDES						
CESIUM-137	*PCI/G*			0.203		
PLUTONIUM-238	*PCI/G*		R			
PLUTONIUM-239	*PCI/G*		R			
STRONTIUM-90	*PCI/G*					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S2-16	C1S2-16	C1S2-16	C1S3-01	C1S3-01
Field Sample Identifier		SO-H-C1S2-16-B-D	SO-H-C1S2-16-C	SO-H-C1S2-16-C-D	SO-H-C1S3-01-A	SO-H-C1S3-01-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	1.5-2.5	1.5-2.5	0.0-0.5	0.5-1.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units	Field Duplicate		Field Duplicate		
RADIONUCLIDES						
CESIUM-137	*PCI/G*					
PLUTONIUM-238	*PCI/G*	R		R		R
PLUTONIUM-239	*PCI/G*	R		R		R
STRONTIUM-90	*PCI/G*					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S3-01	C1S3-02	C1S3-02	C1S3-02	C1S3-02
Field Sample Identifier		SO-H-C1S3-01-C	SO-H-C1S3-02-A	SO-H-C1S3-02-A-D	SO-H-C1S3-02-B	SO-H-C1S3-02-B-D
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		2.0-3.0	0.0-0.5	0.0-0.5	0.5-1.5	0.5-1.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units			Field Duplicate		Field Duplicate
RADIONUCLIDES						
CESIUM-137	*PCI/G*					
PLUTONIUM-238	*PCI/G*			R		
PLUTONIUM-239	*PCI/G*			R		
STRONTIUM-90	*PCI/G*					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S3-02	C1S3-02	C1S3-03	C1S3-03	C1S3-03
Field Sample Identifier		SO-H-C1S3-02-C	SO-H-C1S3-02-C-D	SO-H-C1S3-03-A	SO-H-C1S3-03-B	SO-H-C1S3-03-C
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units		Field Duplicate			
RADIONUCLIDES						
CESIUM-137	*PCI/G*					
PLUTONIUM-238	*PCI/G*	0.175				R
PLUTONIUM-239	*PCI/G*	0.375				R
STRONTIUM-90	*PCI/G*					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S3-04	C1S3-04	C1S3-04	C1S3-05	C1S3-05
Field Sample Identifier		SO-H-C1S3-04-A	SO-H-C1S3-04-B	SO-H-C1S3-04-C	SO-H-C1S3-05-A	SO-H-C1S3-05-A-D
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5	0.0-0.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units					Field Duplicate
RADIONUCLIDES						
CESIUM-137	*PCI/G*					
PLUTONIUM-238	*PCI/G*				R	
PLUTONIUM-239	*PCI/G*				R	
STRONTIUM-90	*PCI/G*					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S3-05	C1S3-05	C1S3-05	C1S3-05	C1S3-06
Field Sample Identifier		SO-H-C1S3-05-B	SO-H-C1S3-05-B-D	SO-H-C1S3-05-C	SO-H-C1S3-05-C-D	SO-H-C1S3-06-A
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	0.5-1.5	1.5-2.5	1.5-2.5	0.0-0.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units		Field Duplicate		Field Duplicate	
RADIONUCLIDES						
CESIUM-137	*PCI/G*					
PLUTONIUM-238	*PCI/G*		R			R
PLUTONIUM-239	*PCI/G*		R			R
STRONTIUM-90	*PCI/G*					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S3-06	C1S3-06	C1S3-07	C1S3-07	C1S3-07
Field Sample Identifier		SO-H-C1S3-06-B	SO-H-C1S3-06-C	SO-H-C1S3-07-A	SO-H-C1S3-07-B	SO-H-C1S3-07-C
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units					
RADIONUCLIDES						
CESIUM-137	PCI/G					
PLUTONIUM-238	PCI/G	R	R	R		R
PLUTONIUM-239	PCI/G	R	R	R		R
STRONTIUM-90	PCI/G					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S3-08	C1S3-08	C1S3-08	C1S3-09	C1S3-09
Field Sample Identifier		SO-H-C1S3-08-A	SO-H-C1S3-08-B	SO-H-C1S3-08-C	SO-H-C1S3-09-A	SO-H-C1S3-09-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units					
RADIONUCLIDES						
CESIUM-137	PCI/G					
PLUTONIUM-238	PCI/G	R	R			R
PLUTONIUM-239	PCI/G	R	R			R
STRONTIUM-90	PCI/G					1.275

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S3-09	C1S3-10	C1S3-10	C1S3-10	C1S3-10
Field Sample Identifier		SO-H-C1S3-09-C	SO-H-C1S3-10-A	SO-H-C1S3-10-A-D	SO-H-C1S3-10-B	SO-H-C1S3-10-B-D
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	0.0-0.5	0.0-0.5	0.5-1.5	0.5-1.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units			Field Duplicate		Field Duplicate
RADIONUCLIDES						
CESIUM-137	*PCI/G*					
PLUTONIUM-238	*PCI/G*	R		R	R	R
PLUTONIUM-239	*PCI/G*	R		R	R	R
STRONTIUM-90	*PCI/G*					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S3-10	C1S3-10	C1S3-11	C1S3-11	C1S3-11
Field Sample Identifier		SO-H-C1S3-10-C	SO-H-C1S3-10-C-D	SO-H-C1S3-11-A	SO-H-C1S3-11-B	SO-H-C1S3-11-C
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units		Field Duplicate			
RADIONUCLIDES						
CESIUM-137	*PCI/G*					
PLUTONIUM-238	*PCI/G*			0.003 J-	R	R
PLUTONIUM-239	*PCI/G*				R	R
STRONTIUM-90	*PCI/G*					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S3-12	C1S3-12	C1S3-12	C1S3-13	C1S3-13
Field Sample Identifier		SO-H-C1S3-12-A	SO-H-C1S3-12-B	SO-H-C1S3-12-C	SO-H-C1S3-13-A	SO-H-C1S3-13-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units					
RADIONUCLIDES						
CESIUM-137	PCI/G					
PLUTONIUM-238	PCI/G					0.086
PLUTONIUM-239	PCI/G					
STRONTIUM-90	PCI/G					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S3-13	C1S3-14	C1S3-14	C1S3-14	C1S3-14
Field Sample Identifier		SO-H-C1S3-13-C	SO-H-C1S3-14-A	SO-H-C1S3-14-A-D	SO-H-C1S3-14-B	SO-H-C1S3-14-B-D
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	0.0-0.5	0.0-0.5	0.5-1.5	0.5-1.5
Date of Sample		12/19/18	12/21/18	12/21/18	12/21/18	12/21/18
Parameter	Units			Field Duplicate		Field Duplicate
RADIONUCLIDES						
CESIUM-137	*PCI/G*					
PLUTONIUM-238	*PCI/G*		R			
PLUTONIUM-239	*PCI/G*		R			
STRONTIUM-90	*PCI/G*					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S3-14	C1S3-14	C1S4-01	C1S4-01	C1S4-01
Field Sample Identifier		SO-H-C1S3-14-C	SO-H-C1S3-14-C-D	SO-H-C1S4-01-A	SO-H-C1S4-01-B	SO-H-C1S4-01-C
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5
Date of Sample		12/21/18	12/21/18	12/19/18	12/19/18	12/19/18
Parameter	Units		Field Duplicate			
RADIONUCLIDES						
CESIUM-137	*PCI/G*					
PLUTONIUM-238	*PCI/G*	R				
PLUTONIUM-239	*PCI/G*	R		0.076	0.037	
STRONTIUM-90	*PCI/G*					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S4-02	C1S4-02	C1S4-02	C1S4-03	C1S4-03
Field Sample Identifier		SO-H-C1S4-02-A	SO-H-C1S4-02-B	SO-H-C1S4-02-C	SO-H-C1S4-03-A	SO-H-C1S4-03-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units					
RADIONUCLIDES						
CESIUM-137	PCI/G					
PLUTONIUM-238	PCI/G	R	R			
PLUTONIUM-239	PCI/G	R	R			
STRONTIUM-90	PCI/G					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S4-03	C1S4-04	C1S4-04	C1S4-04	C1S4-04
Field Sample Identifier		SO-H-C1S4-03-C	SO-H-C1S4-04-A	SO-H-C1S4-04-A-D	SO-H-C1S4-04-B	SO-H-C1S4-04-B-D
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	0.0-0.5	0.0-0.5	0.5-1.5	0.5-1.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units			Field Duplicate		Field Duplicate
RADIONUCLIDES						
CESIUM-137	*PCI/G*					
PLUTONIUM-238	*PCI/G*			R		
PLUTONIUM-239	*PCI/G*			R		
STRONTIUM-90	*PCI/G*					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S4-04	C1S4-04	C1S4-05	C1S4-05	C1S4-05
Field Sample Identifier		SO-H-C1S4-04-C	SO-H-C1S4-04-C-D	SO-H-C1S4-05-A	SO-H-C1S4-05-A-D	SO-H-C1S4-05-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	1.5-2.5	0.0-0.5	0.0-0.5	0.5-1.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units		Field Duplicate		Field Duplicate	
RADIONUCLIDES						
CESIUM-137	*PCI/G*					
PLUTONIUM-238	*PCI/G*			R		R
PLUTONIUM-239	*PCI/G*			R		R
STRONTIUM-90	*PCI/G*		0.305			

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S4-05	C1S4-05	C1S4-05	C1S4-06	C1S4-06
Field Sample Identifier		SO-H-C1S4-05-B-D	SO-H-C1S4-05-C	SO-H-C1S4-05-C-D	SO-H-C1S4-06-A	SO-H-C1S4-06-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	1.5-2.5	1.5-2.5	0.0-0.5	0.5-1.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units	Field Duplicate		Field Duplicate		
RADIONUCLIDES						
CESIUM-137	*PCI/G*					
PLUTONIUM-238	*PCI/G*	0.101	0.137			
PLUTONIUM-239	*PCI/G*					
STRONTIUM-90	*PCI/G*					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S4-06	C1S4-07	C1S4-07	C1S4-07	C1S4-08
Field Sample Identifier		SO-H-C1S4-06-C	SO-H-C1S4-07-A	SO-H-C1S4-07-B	SO-H-C1S4-07-C	SO-H-C1S4-08-A
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units					
RADIONUCLIDES						
CESIUM-137	PCI/G					
PLUTONIUM-238	PCI/G		R			
PLUTONIUM-239	PCI/G		R			
STRONTIUM-90	PCI/G					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S4-08	C1S4-08	C1S4-09	C1S4-09	C1S4-09
Field Sample Identifier		SO-H-C1S4-08-B	SO-H-C1S4-08-C	SO-H-C1S4-09-A	SO-H-C1S4-09-A-D	SO-H-C1S4-09-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	1.5-2.5	0.0-0.5	0.0-0.5	0.5-1.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units				Field Duplicate	
RADIONUCLIDES						
CESIUM-137	*PCI/G*					
PLUTONIUM-238	*PCI/G*			R	R	
PLUTONIUM-239	*PCI/G*			R	R	
STRONTIUM-90	*PCI/G*				0.342	

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S4-09	C1S4-09	C1S4-09	C1S4-10	C1S4-10
Field Sample Identifier		SO-H-C1S4-09-B-D	SO-H-C1S4-09-C	SO-H-C1S4-09-C-D	SO-H-C1S4-10-A	SO-H-C1S4-10-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	1.5-2.5	1.5-2.5	0.0-0.5	0.5-1.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units	Field Duplicate		Field Duplicate		
RADIONUCLIDES						
CESIUM-137	*PCI/G*					
PLUTONIUM-238	*PCI/G*	R	R	R		
PLUTONIUM-239	*PCI/G*	R	R	R		
STRONTIUM-90	*PCI/G*					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S4-10	C1S4-11	C1S4-11	C1S4-11	C1S4-12
Field Sample Identifier		SO-H-C1S4-10-C	SO-H-C1S4-11-A	SO-H-C1S4-11-B	SO-H-C1S4-11-C	SO-H-C1S4-12-A
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units					
RADIONUCLIDES						
CESIUM-137	PCI/G					
PLUTONIUM-238	PCI/G	R	R	R	R	
PLUTONIUM-239	PCI/G	R	R	R	R	
STRONTIUM-90	PCI/G					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S4-12	C1S4-12	C1S4-13	C1S4-13	C1S4-13
Field Sample Identifier		SO-H-C1S4-12-B	SO-H-C1S4-12-C	SO-H-C1S4-13-A	SO-H-C1S4-13-B	SO-H-C1S4-13-C
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5
Date of Sample		12/19/18	12/19/18	12/20/18	12/20/18	12/20/18
Parameter	Units					
RADIONUCLIDES						
CESIUM-137	PCI/G					
PLUTONIUM-238	PCI/G	R				
PLUTONIUM-239	PCI/G	R				
STRONTIUM-90	PCI/G					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1S4-14	C1S4-14	C1S4-14	C2-01	C2-01
Field Sample Identifier		SO-H-C1S4-14-A	SO-H-C1S4-14-B	SO-H-C1S4-14-C	SO-H-C2-01-A	SO-H-C2-01-A-D
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5	0.0-0.5
Date of Sample		12/20/18	12/20/18	12/20/18	12/19/18	12/19/18
Parameter	Units					Field Duplicate
RADIONUCLIDES						
CESIUM-137	*PCI/G*				0.225	0.155
PLUTONIUM-238	*PCI/G*		R			
PLUTONIUM-239	*PCI/G*		R			
STRONTIUM-90	*PCI/G*					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C2-01	C2-01	C2-01	C2-01	C2-02
Field Sample Identifier		SO-H-C2-01-B	SO-H-C2-01-B-D	SO-H-C2-01-C	SO-H-C2-01-C-D	SO-H-C2-02-A
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	0.5-1.5	1.5-2.5	1.5-2.5	0.0-0.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units		Field Duplicate		Field Duplicate	
RADIONUCLIDES						
CESIUM-137	*PCI/G*					
PLUTONIUM-238	*PCI/G*					0.035 J
PLUTONIUM-239	*PCI/G*					
STRONTIUM-90	*PCI/G*					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C2-02	C2-02	C2-03	C2-03	C2-03
Field Sample Identifier		SO-H-C2-02-B	SO-H-C2-02-C	SO-H-C2-03-A	SO-H-C2-03-B	SO-H-C2-03-C
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units					
RADIONUCLIDES						
CESIUM-137	PCI/G					
PLUTONIUM-238	PCI/G	R			R	
PLUTONIUM-239	PCI/G	R			R	
STRONTIUM-90	PCI/G					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C2-04	C2-04	C2-04	C2-05	C2-05
Field Sample Identifier		SO-H-C2-04-A	SO-H-C2-04-B	SO-H-C2-04-C	SO-H-C2-05-A	SO-H-C2-05-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units					
RADIONUCLIDES						
CESIUM-137	PCI/G				0.154	
PLUTONIUM-238	PCI/G					R
PLUTONIUM-239	PCI/G					R
STRONTIUM-90	PCI/G					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C2-05	C2-06	C2-06	C2-06	C2-07
Field Sample Identifier		SO-H-C2-05-C	SO-H-C2-06-A	SO-H-C2-06-B	SO-H-C2-06-C	SO-H-C2-07-A
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units					
RADIONUCLIDES						
CESIUM-137	*PCI/G*					
PLUTONIUM-238	*PCI/G*	R				R
PLUTONIUM-239	*PCI/G*	R				R
STRONTIUM-90	*PCI/G*					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C2-07	C2-07	C2-08	C2-08	C2-08
Field Sample Identifier		SO-H-C2-07-B	SO-H-C2-07-C	SO-H-C2-08-A	SO-H-C2-08-B	SO-H-C2-08-C
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	3.5-4.5	0.0-0.5	0.5-1.5	1.5-2.5
Date of Sample		12/19/18	12/19/18	12/20/18	12/20/18	12/20/18
Parameter	Units					
RADIONUCLIDES						
CESIUM-137	*PCI/G*		0.176			0.109
PLUTONIUM-238	*PCI/G*					
PLUTONIUM-239	*PCI/G*					
STRONTIUM-90	*PCI/G*					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C2-09	C2-09	C2-09	C2-10	C2-10
Field Sample Identifier		SO-H-C2-09-A	SO-H-C2-09-B	SO-H-C2-09-C	SO-H-C2-10-A	SO-H-C2-10-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5
Date of Sample		12/20/18	12/20/18	12/20/18	12/19/18	12/19/18
Parameter	Units					
RADIONUCLIDES						
CESIUM-137	*PCI/G*	0.241			0.205	
PLUTONIUM-238	*PCI/G*					
PLUTONIUM-239	*PCI/G*					
STRONTIUM-90	*PCI/G*					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C2-10	C2-11	C2-11	C2-11	C2-12
Field Sample Identifier		SO-H-C2-10-C	SO-H-C2-11-A	SO-H-C2-11-B	SO-H-C2-11-C	SO-H-C2-12-A
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	0.0-0.5	0.5-1.5	2.5-3.5	0.0-0.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units					
RADIONUCLIDES						
CESIUM-137	PCI/G		0.27			
PLUTONIUM-238	PCI/G		0.081			R
PLUTONIUM-239	PCI/G		0.122			R
STRONTIUM-90	PCI/G					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C2-12	C2-12	C2-13	C2-13	C2-13
Field Sample Identifier		SO-H-C2-12-B	SO-H-C2-12-C	SO-H-C2-13-A	SO-H-C2-13-B	SO-H-C2-13-C
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5
Date of Sample		12/19/18	12/19/18	12/20/18	12/20/18	12/20/18
Parameter	Units					
RADIONUCLIDES						
CESIUM-137	PCI/G		0.107			
PLUTONIUM-238	PCI/G					
PLUTONIUM-239	PCI/G					
STRONTIUM-90	PCI/G					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C2-14	C2-14	C2-14	C2-15	C2-15
Field Sample Identifier		SO-H-C2-14-A	SO-H-C2-14-B	SO-H-C2-14-C	SO-H-C2-15-A	SO-H-C2-15-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5
Date of Sample		12/20/18	12/20/18	12/20/18	12/20/18	12/20/18
Parameter	Units					
RADIONUCLIDES						
CESIUM-137	*PCI/G*	0.145			0.183	
PLUTONIUM-238	*PCI/G*					
PLUTONIUM-239	*PCI/G*					
STRONTIUM-90	*PCI/G*					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C2-15	C2-16	C2-16	C2-16	C2-17
Field Sample Identifier		SO-H-C2-15-C	SO-H-C2-16-A	SO-H-C2-16-B	SO-H-C2-16-C	SO-H-C2-17-A
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5
Date of Sample		12/20/18	12/20/18	12/20/18	12/20/18	12/19/18
Parameter	Units					
RADIONUCLIDES						
CESIUM-137	PCI/G		0.188			
PLUTONIUM-238	PCI/G					
PLUTONIUM-239	PCI/G					
STRONTIUM-90	PCI/G					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C2-17	C2-17	CP-01	CP-01	CP-01
Field Sample Identifier		SO-H-C2-17-B	SO-H-C2-17-C	SO-H-CP01-A	SO-H-CP01-B	SO-H-CP01-C
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units					
RADIONUCLIDES						
CESIUM-137	PCI/G					
PLUTONIUM-238	PCI/G					
PLUTONIUM-239	PCI/G		0.034			
STRONTIUM-90	PCI/G					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		CP-02	CP-02	CP-02	HOTSPOT-01	HOTSPOT-01
Field Sample Identifier		SO-H-CP02-A	SO-H-CP02-B	SO-H-CP02-C	SO-H-HTSP-01A-A	SO-H-HTSP-01A-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5
Date of Sample		12/19/18	12/19/18	12/19/18	12/20/18	12/20/18
Parameter	Units					
RADIONUCLIDES						
CESIUM-137	*PCI/G*					
PLUTONIUM-238	*PCI/G*				R	R
PLUTONIUM-239	*PCI/G*				R	R
STRONTIUM-90	*PCI/G*					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		HOTSPOT-01	HOTSPOT-02	HOTSPOT-02	HOTSPOT-02	HOTSPOT-02
Field Sample Identifier		SO-H-HTSP-01A-C	SO-H-HTSP-01-A	SO-H-HTSP-01-A-D	SO-H-HTSP-01-B	SO-H-HTSP-01-B-D
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	0.0-0.5	0.0-0.5	0.5-1.5	0.5-1.5
Date of Sample		12/20/18	12/19/18	12/19/18	12/19/18	12/19/18
Parameter	Units			Field Duplicate		Field Duplicate
RADIONUCLIDES						
CESIUM-137	*PCI/G*					
PLUTONIUM-238	*PCI/G*				R	R
PLUTONIUM-239	*PCI/G*				R	R
STRONTIUM-90	*PCI/G*				0.373	0.537

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		HOTSPOT-02	HOTSPOT-02	HOTSPOT-03	HOTSPOT-03	HOTSPOT-03
Field Sample Identifier		SO-H-HTSP-01-C	SO-H-HTSP-01-C-D	SO-H-HTSP-03-A	SO-H-HTSP-03-B	SO-H-HTSP-03-C
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5
Date of Sample		12/19/18	12/19/18	12/21/18	12/21/18	12/21/18
Parameter	Units		Field Duplicate			
RADIONUCLIDES						
CESIUM-137	*PCI/G*					
PLUTONIUM-238	*PCI/G*			0.04 J	R	
PLUTONIUM-239	*PCI/G*				R	
STRONTIUM-90	*PCI/G*					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		HOTSPOT-04	HOTSPOT-04	HOTSPOT-04	HOTSPOT-05	HOTSPOT-05
Field Sample Identifier		SO-H-HTSP-04-A	SO-H-HTSP-04-B	SO-H-HTSP-04-C	SO-H-HTSP-05-A	SO-H-HTSP-05-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5
Date of Sample		12/21/18	12/21/18	12/21/18	12/21/18	12/21/18
Parameter	Units					
RADIONUCLIDES						
CESIUM-137	PCI/G					
PLUTONIUM-238	PCI/G		R			
PLUTONIUM-239	PCI/G		R			
STRONTIUM-90	PCI/G					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		HOTSPOT-05	HOTSPOT-06	HOTSPOT-06	HOTSPOT-06	HOTSPOT-07
Field Sample Identifier		SO-H-HTSP-05-C	SO-H-HTSP-06-A	SO-H-HTSP-06-B	SO-H-HTSP-06-C	SO-H-HTSP-07-A
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5
Date of Sample		12/21/18	12/21/18	12/21/18	12/21/18	12/21/18
Parameter	Units					
RADIONUCLIDES						
CESIUM-137	*PCI/G*					
PLUTONIUM-238	*PCI/G*	R				
PLUTONIUM-239	*PCI/G*	R			0.593	
STRONTIUM-90	*PCI/G*					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		HOTSPOT-07	HOTSPOT-07	HOTSPOT-08	HOTSPOT-08	HOTSPOT-08
Field Sample Identifier		SO-H-HTSP-07-B	SO-H-HTSP-07-C	SO-H-HTSP-08-A	SO-H-HTSP-08-B	SO-H-HTSP-08-C
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5
Date of Sample		12/21/18	12/21/18	12/21/18	12/21/18	12/21/18
Parameter	Units					
RADIONUCLIDES						
CESIUM-137	PCI/G					
PLUTONIUM-238	PCI/G		R			
PLUTONIUM-239	PCI/G		R			
STRONTIUM-90	PCI/G					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		HOTSPOT-09	HOTSPOT-09	HOTSPOT-09	HOTSPOT-10	HOTSPOT-10
Field Sample Identifier		SO-H-HTSP-09-A	SO-H-HTSP-09-B	SO-H-HTSP-09-C	SO-H-HTSP-10-A	SO-H-HTSP-10-B
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-0.5	0.5-1.5	1.5-2.5	0.0-0.5	0.5-1.5
Date of Sample		12/21/18	12/21/18	12/21/18	12/21/18	12/21/18
Parameter	Units					
RADIONUCLIDES						
CESIUM-137	*PCI/G*				0.225	
PLUTONIUM-238	*PCI/G*	R			R	
PLUTONIUM-239	*PCI/G*	R			R	
STRONTIUM-90	*PCI/G*					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		HOTSPOT-10	HOTSPOT-11	HOTSPOT-11	HOTSPOT-11	HOTSPOT-11
Field Sample Identifier		SO-H-HTSP-10-C	SO-H-HTSP-11-A	SO-H-HTSP-11-A-D	SO-H-HTSP-11-B	SO-H-HTSP-11-B-D
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	0.0-0.5	0.0-0.5	0.5-1.5	0.5-1.5
Date of Sample		12/21/18	01/23/19	01/23/19	01/23/19	01/23/19
Parameter	Units			Field Duplicate		Field Duplicate
RADIONUCLIDES						
CESIUM-137	*PCI/G*					
PLUTONIUM-238	*PCI/G*					
PLUTONIUM-239	*PCI/G*					
STRONTIUM-90	*PCI/G*					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-1
KAPL ANALYTICAL RESULTS FOR SOIL
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		HOTSPOT-11	HOTSPOT-11	HOTSPOT-12	HOTSPOT-12	HOTSPOT-12
Field Sample Identifier		SO-H-HTSP-11-C	SO-H-HTSP-11-C-D	SO-H-HTSP-12-A	SO-H-HTSP-12-B	SO-H-HTSP-12-C
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		1.5-2.5	1.5-2.5	0.0-0.5	0.5-1.5	1.5-2.5
Date of Sample		01/23/19	01/23/19	01/23/19	01/23/19	01/23/19
Parameter	Units		Field Duplicate			
RADIONUCLIDES						
CESIUM-137	*PCI/G*					
PLUTONIUM-238	*PCI/G*					
PLUTONIUM-239	*PCI/G*					
STRONTIUM-90	*PCI/G*					

The qualifiers shown were assigned during chemistry validation.

J: The result was an estimated quantity, which is the result of associated lab QC outside the lab acceptance criteria.
J-: The result was an estimated quantity, but the result may be biased low due to associated lab QC criteria exceeding lower criteria limits.
R: The data is rejected.

NOTE: Non-Detected results are shown as blank.

TABLE D-2
KAPL ANALYTICAL RESULTS FOR GROUNDWATER
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		C1-20-BP3	C1-2-A100-BP4	C1-2-BP1
Field Sample Identifier		GW-H-C1-20-BP3	GW-H-C1-2-A100-BP4	GW-H-C1-2-BP1
Sample Matrix		Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-
Date of Sample		12/11/18	12/11/18	12/11/18
Parameter	Units			
RADIONUCLIDES				
CESIUM-137	PCI/L			
PLUTONIUM-238	PCI/L			
PLUTONIUM-239	PCI/L			
STRONTIUM-90	PCI/L			
RADIONUCLIDES (FILTERED)				
CESIUM-137	PCI/L			
PLUTONIUM-238	PCI/L			
PLUTONIUM-239	PCI/L			0.034
STRONTIUM-90	PCI/L			

The qualifiers shown were assigned during chemistry validation.

NOTE: Non-Detected results are shown as blank.

TABLE D-3
KAPL ANALYTICAL RESULTS FOR PONDED WATER
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		WS-01	WS-02	WS-03	WS-04	WS-05
Field Sample Identifier		SW-H-C2-08	SW-H-C2-10	SW-H-C2-11a	SW-H-C1S1-04	SW-H-C1S1-10
Sample Matrix		Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
Depth Interval (ft)		-	-	-	-	-
Date of Sample		12/03/18	11/30/18	11/30/18	11/29/18	11/30/18
Parameter	Units					
RADIONUCLIDES						
CESIUM-137	PCI/L					
PLUTONIUM-238	PCI/L					
PLUTONIUM-239	PCI/L					
STRONTIUM-90	PCI/L					
RADIONUCLIDES (FILTERED)						
CESIUM-137	PCI/L					
PLUTONIUM-238	PCI/L					
PLUTONIUM-239	PCI/L					
STRONTIUM-90	PCI/L					

The qualifiers shown were assigned during chemistry validation.

NOTE: Non-Detected results are shown as blank.

TABLE D-3
KAPL ANALYTICAL RESULTS FOR PONDED WATER
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		WS-06	WS-07	WS-08	WS-08
Field Sample Identifier		SW-H-C1S2-03	SW-H-C1S2-07	SW-H-C1S2-11	SW-H-C1S2-11-D
Sample Matrix		Surface Water	Surface Water	Surface Water	Surface Water
Depth Interval (ft)		-	-	-	-
Date of Sample		11/29/18	11/30/18	11/29/18	11/29/18
Parameter	Units				Field Duplicate
RADIONUCLIDES					
CESIUM-137	PCI/L				
PLUTONIUM-238	PCI/L			0.074	
PLUTONIUM-239	PCI/L	0.249			
STRONTIUM-90	PCI/L				
RADIONUCLIDES (FILTERED)					
CESIUM-137	PCI/L				
PLUTONIUM-238	PCI/L				
PLUTONIUM-239	PCI/L	0.1	0.134		
STRONTIUM-90	PCI/L				

The qualifiers shown were assigned during chemistry validation.

NOTE: Non-Detected results are shown as blank.

TABLE D-4
KAPL ANALYTICAL RESULTS FOR CONCRETE
NIAGARA FALLS STORAGE SITE - VICINITY PROPERTY H'

Location Identifier		CP-01	CP-01	CP-02
Field Sample Identifier		CON-H-CP-01-SLAB-A	CON-H-CP-01-SLAB-B	CON-H-CP-02-SLAB
Sample Matrix		Concrete	Concrete	Concrete
Depth Interval (ft)		0.0-0.5	0.5-1.5	0.0-0.5
Date of Sample		12/21/18	12/21/18	12/21/18
Parameter	Units			
RADIONUCLIDES				
CESIUM-137	PCI/G		0.546	
PLUTONIUM-238	PCI/G		0.085	
PLUTONIUM-239	PCI/G		3.545	
STRONTIUM-90	PCI/G			

The qualifiers shown were assigned during chemistry validation.

NOTE: Non-Detected results are shown as blank.

APPENDIX E
SOIL SCREENING LEVEL MODEL DETAILS

Attachment A. VP-H' Soil Screening Values to Protect Groundwater

Evaluation Scenario	K_d Soil-water partition coefficient (L/kg)	C_{sat} Soil saturation concentration (mg/kg)	C_w Target soil leachate concentration (mg/L)	GW Partitioning Soil Screening Level - SSL (mg/kg)	C_w Soil pore leachate concentration (mg/L)	d mixing zone depth (m)	DF EPA Calculated Dilution Factor	DF Assigned Dilution Factor	Mass Limit Soil Screening Level - SSLml (mg/kg)
Baseline DF Calculated	122	38144	0.030	3.68	0.197	22.15	1.0	--	0.17
Baseline DF Calculated Mixing Zone Assigned	122	38144	0.030	3.67	0.197	3.10	1.0	--	0.17
Baseline DF Assigned	122	38144	0.120	14.67	0.197	22.15	--	4.0	0.70
Baseline DF Assigned Mixing Zone Assigned	122	38144	0.120	14.67	0.197	3.10	--	4.0	0.70

Dilution-Attenuation Factor (DF) and Screening Levels estimated using site-specific data inputs according to USEPA, 1996: Soil Screening Guidance: User's Guide, Second Edition.

Deterministic Input

Subsoil U PRG (mg/kg) =	1040	NFSS-specific Risk-based Value (USACE 2020)
Maximum Observed Water Concentration (mg/L) =	0.0225	Monitoring Well C1-2-A100-BP4 Sample
S - solubility in water (mg/L) =	312	MINTEQA2 Modeling
pb - dry soil bulk density (kg/L) =	1.45	Site Geotechnical Literature
θw - water filled soil porosity (L/L) =	0.37	Vadose Zone - Partial Saturation
H' - Henry's Law Constant =	0	Uranium Metal
θA - air-filled soil porosity (L/L) =	0.08	Vadose Zone - Partial Saturation
ps - soil particle density (kg/L) =	2.65	Literaure Based
n - total soil porosity (L/L) =	0.45	Based on Bulk Density
MCL (mg/L) =	0.03	MCL
Cs - Soil Concentration (mg/kg) =	24.1	VP-H' Data - Maximum Total U
K - aquifer hydraulic conductivity (m/yr) =	1.02	Geomean K - HGL Model = 1.02 m/y
i - hydraulic gradient (m/m) =	0.0022	ESP TM Average
I - infiltration rate (m/yr) =	0.06	HGL Report
L - source length parallel to GW flow (m) =	180	VP-H' Long Dimension
da - saturated zone thickness (m) =	3.1	Upper Clay Till/Brown Clay Till
ds - depth of source (m) =	0.5	Average Depth to Ra-226>= 5.0 pCi/g is 1.5 feet
ED - Exposure Duration (yr) =	70	

Governing Equations

$$C_{sat} = \frac{S}{\rho_b}\left(K_d \rho_b + \theta_w + H'\theta_a\right)$$

$$C_W = MCL \times DF$$

$$SSL = C_W\left(K_d + \frac{\theta_w + \theta_a H'}{\rho_b}\right)$$

$$C_w = \frac{C_s}{\left(K_d + \frac{\theta_w + \theta_a H'}{\rho_b}\right)}$$

$$d = (0.0112L^2)^{0.5} + d_a\left(1 - \exp\left(\frac{(-L*I)}{(K*i*d_a)}\right)\right)$$

$$DF = 1 + \left(\frac{(K)(i)(d)}{(I)(L)}\right)$$

$$SSLml = \frac{(C_w \times I \times ED)}{(\rho_b \times d_s)}$$

Reference: USEPA, 1996. Soil Screening Guidance: User's Guide, Second Edition.

Deterministic Input

K - hydraulic conductivity (m/yr) =	1.02	See Notes Above
i - hydraulic gradient (m/m) =	0.002	
I - infiltration rate (m/yr) =	0.06	
L - source length parallel to GW flow (m) =	180	
d - mixing zone depth (m) =	22.1	
da - saturated zone thickness (m) =	3.1	
DF (Calculated Dilution Factor)=	1.00	

Attachment B. Estimated Uranium Concentrations in Groundwater Based on Soil Concentrations

Location	Sample Number	Sample Interval (ft)		Radionuclide	Analytical Result	Unit	Quality Flag	Total U Calculated (mg/kg)	Equilibrium Concentration (ug/L) in Pore Water (Kd=121 L/kg)	GW Concentration (ug/L) Dilution-Attenuation Factor 4.0
C1S4-06	SO-H-C1S4-06-B	0.5	1.5	URANIUM-238	8.023	PCI/G	B	24.09	199.12	49.78
C1S4-06	SO-H-C1S4-06-C	1.5	2.5	URANIUM-238	6.129	PCI/G	B	18.41	152.11	38.03
C1S4-12	SO-H-C1S4-12-A	0	0.5	URANIUM-238	4.051	PCI/G	B	12.17	100.54	25.13
C1S4-12	SO-H-C1S4-12-C	1.5	2.5	URANIUM-238	3.254	PCI/G	B	9.77	80.76	20.19
C1S4-10	SO-H-C1S4-10-C	1.5	2.5	URANIUM-238	2.567	PCI/G	B	7.71	63.71	15.93
C1S4-09	SO-H-C1S4-09-C	1.5	2.5	URANIUM-238	2.437	PCI/G	B	7.32	60.48	15.12
C1S4-09	SO-H-C1S4-09-C-D	1.5	2.5	URANIUM-238	2.245	PCI/G		6.74	55.72	13.93
HOTSPOT-07	SO-H-HTSP-07-A	0	0.5	URANIUM-238	2.242	PCI/G		6.73	55.64	13.91
HOTSPOT-02	SO-H-HTSP-01-B	0.5	1.5	URANIUM-238	2.133	PCI/G	B	6.41	52.94	13.23
C1S3-11	SO-H-C1S3-11-B	0.5	1.5	URANIUM-238	2.108	PCI/G	B	6.33	52.32	13.08
HOTSPOT-07	SO-H-HTSP-07-B	0.5	1.5	URANIUM-238	2.041	PCI/G		6.13	50.65	12.66
C1S2-10	SO-H-C1S2-10-B-D	0.5	1.5	URANIUM-238	1.989	PCI/G	J	5.97	49.36	12.34
C1S2-10	SO-H-C1S2-10-C-D	1.5	2.5	URANIUM-238	1.971	PCI/G		5.92	48.92	12.23
C2-12	SO-H-C2-12-B	0.5	1.5	URANIUM-238	1.953	PCI/G	B	5.86	48.47	12.12
HOTSPOT-07	SO-H-HTSP-07-C	1.5	2.5	URANIUM-238	1.945	PCI/G		5.84	48.27	12.07
C1S3-05	SO-H-C1S3-05-B	0.5	1.5	URANIUM-238	1.939	PCI/G	B	5.82	48.12	12.03
C1S4-08	SO-H-C1S4-08-C	1.5	2.5	URANIUM-238	1.938	PCI/G		5.82	48.10	12.02
C1S4-13	SO-H-C1S4-13-C	1.5	2.5	URANIUM-238	1.855	PCI/G		5.57	46.04	11.51
C1S2-08	SO-H-C1S2-08-B	0.5	1.5	URANIUM-238	1.84	PCI/G		5.53	45.67	11.42
C1S3-11	SO-H-C1S3-11-C	1.5	2.5	URANIUM-238	1.73	PCI/G	B	5.20	42.94	10.73
HOTSPOT-05	SO-H-HTSP-05-A	0	0.5	URANIUM-238	1.704	PCI/G	B	5.12	42.29	10.57
C1S4-13	SO-H-C1S4-13-B	0.5	1.5	URANIUM-238	1.689	PCI/G		5.07	41.92	10.48
C1S2-15	SO-H-C1S2-15-C	1.5	2.5	URANIUM-238	1.675	PCI/G		5.03	41.57	10.39
HOTSPOT-02	SO-H-HTSP-01-C-D	1.5	2.5	URANIUM-238	1.674	PCI/G		5.03	41.55	10.39
C1S3-05	SO-H-C1S3-05-B-D	0.5	1.5	URANIUM-238	1.666	PCI/G		5.00	41.35	10.34
C1S2-09	SO-H-C1S2-09-B	0.5	1.5	URANIUM-238	1.627	PCI/G		4.89	40.38	10.09
HOTSPOT-04	SO-H-HTSP-04-A	0	0.5	URANIUM-238	1.601	PCI/G	B	4.81	39.73	9.93
C2-13	SO-H-C2-13-C	1.5	2.5	URANIUM-238	1.56	PCI/G		4.68	38.72	9.68
C1S1-05	SO-H-C1S1-05-C	1.5	2.5	URANIUM-238	1.559	PCI/G		4.68	38.69	9.67
C1S2-01	SO-H-C1S2-01-C	1.5	2.5	URANIUM-238	1.546	PCI/G	B	4.64	38.37	9.59
C1S4-08	SO-H-C1S4-08-B	0.5	1.5	URANIUM-238	1.527	PCI/G		4.59	37.90	9.47
C1S1-07	SO-H-C1S1-07-B	0.5	1.5	URANIUM-238	1.429	PCI/G		4.29	35.47	8.87
HOTSPOT-03	SO-H-HTSP-03-B	0.5	1.5	URANIUM-238	1.417	PCI/G	B	4.26	35.17	8.79
C1S2-16	SO-H-C1S2-16-C-D	1.5	2.5	URANIUM-238	1.411	PCI/G		4.24	35.02	8.75
C1S3-05	SO-H-C1S3-05-C-D	1.5	2.5	URANIUM-238	1.404	PCI/G		4.22	34.84	8.71
HOTSPOT-01	SO-H-HTSP-01A-C	1.5	2.5	URANIUM-238	1.404	PCI/G		4.22	34.84	8.71
C1S1-08	SO-H-C1S1-08-B	0.5	1.5	URANIUM-238	1.402	PCI/G		4.21	34.80	8.70
C1S2-16	SO-H-C1S2-16-B	0.5	1.5	URANIUM-238	1.381	PCI/G		4.15	34.27	8.57
C2-12	SO-H-C2-12-C	1.5	2.5	URANIUM-238	1.379	PCI/G	B	4.14	34.22	8.56
C1S2-16	SO-H-C1S2-16-B-D	0.5	1.5	URANIUM-238	1.372	PCI/G		4.12	34.05	8.51
C1S2-07	SO-H-C1S2-07-B	0.5	1.5	URANIUM-238	1.368	PCI/G		4.11	33.95	8.49
HOTSPOT-02	SO-H-HTSP-01-C	1.5	2.5	URANIUM-238	1.362	PCI/G	B	4.09	33.80	8.45
C1S1-03	SO-H-C1S1-03-C	1.5	2.5	URANIUM-238	1.356	PCI/G	B	4.07	33.65	8.41
C1S3-14	SO-H-C1S3-14-B-D	0.5	1.5	URANIUM-238	1.322	PCI/G		3.97	32.81	8.20
C2-12	SO-H-C2-12-A	0	0.5	URANIUM-238	1.321	PCI/G	B	3.97	32.78	8.20
C1S3-09	SO-H-C1S3-09-C	1.5	2.5	URANIUM-238	1.319	PCI/G		3.96	32.74	8.18
C1S3-12	SO-H-C1S3-12-B	0.5	1.5	URANIUM-238	1.317	PCI/G	B	3.95	32.69	8.17
C1S2-15	SO-H-C1S2-15-B	0.5	1.5	URANIUM-238	1.312	PCI/G		3.94	32.56	8.14
HOTSPOT-12	SO-H-HTSP-12-A	0	0.5	URANIUM-238	1.3	PCI/G		3.90	32.26	8.07
C1S4-12	SO-H-C1S4-12-B	0.5	1.5	URANIUM-238	1.299	PCI/G	B	3.90	32.24	8.06
C1S2-06	SO-H-C1S2-06-B	0.5	1.5	URANIUM-238	1.297	PCI/G		3.89	32.19	8.05
C1S2-14	SO-H-C1S2-14-B	0.5	1.5	URANIUM-238	1.291	PCI/G		3.88	32.04	8.01
C1S3-14	SO-H-C1S3-14-B	0.5	1.5	URANIUM-238	1.289	PCI/G		3.87	31.99	8.00
HOTSPOT-10	SO-H-HTSP-10-A	0	0.5	URANIUM-238	1.287	PCI/G		3.86	31.94	7.99
C1S1-04	SO-H-C1S1-04-C	1.5	2.5	URANIUM-238	1.286	PCI/G		3.86	31.92	7.98

C1S3-10	SO-H-C1S3-10-C-D	1.5	2.5	URANIUM-238	1.286	PCI/G	J	3.86	31.92	7.98
C1S2-13	SO-H-C1S2-13-B	0.5	1.5	URANIUM-238	1.285	PCI/G		3.86	31.89	7.97
C1S3-14	SO-H-C1S3-14-C	1.5	2.5	URANIUM-238	1.28	PCI/G		3.84	31.77	7.94
C1S3-12	SO-H-C1S3-12-C	1.5	2.5	URANIUM-238	1.259	PCI/G	B	3.78	31.25	7.81
C1S3-07	SO-H-C1S3-07-B	0.5	1.5	URANIUM-238	1.258	PCI/G	B	3.78	31.22	7.81
HOTSPOT-05	SO-H-HTSP-05-B	0.5	1.5	URANIUM-238	1.257	PCI/G	B	3.77	31.20	7.80
HOTSPOT-04	SO-H-HTSP-04-B	0.5	1.5	URANIUM-238	1.245	PCI/G	B	3.74	30.90	7.72
HOTSPOT-06	SO-H-HTSP-06-C	1.5	2.5	URANIUM-238	1.242	PCI/G	B	3.73	30.82	7.71
C1S1-06	SO-H-C1S1-06-C-D	1.5	2.5	URANIUM-238	1.233	PCI/G		3.70	30.60	7.65
C1S2-02	SO-H-C1S2-02-B	0.5	1.5	URANIUM-238	1.23	PCI/G	B	3.69	30.53	7.63
C1S4-05	SO-H-C1S4-05-B	0.5	1.5	URANIUM-238	1.226	PCI/G	B	3.68	30.43	7.61
HOTSPOT-03	SO-H-HTSP-03-C	1.5	2.5	URANIUM-238	1.22	PCI/G	B	3.66	30.28	7.57
C1S4-09	SO-H-C1S4-09-B-D	0.5	1.5	URANIUM-238	1.209	PCI/G		3.63	30.01	7.50
C1S2-05	SO-H-C1S2-05-C	1.5	2.5	URANIUM-238	1.207	PCI/G		3.62	29.96	7.49
C1S4-07	SO-H-C1S4-07-C	1.5	2.5	URANIUM-238	1.202	PCI/G		3.61	29.83	7.46
HOTSPOT-11	SO-H-HTSP-11-A	0	0.5	URANIUM-238	1.19	PCI/G		3.57	29.53	7.38
C1S3-04	SO-H-C1S3-04-C	1.5	2.5	URANIUM-238	1.187	PCI/G		3.56	29.46	7.36
C1S3-07	SO-H-C1S3-07-C	1.5	2.5	URANIUM-238	1.187	PCI/G	B	3.56	29.46	7.36
C1S1-10	SO-H-C1S1-10-B	0.5	1.5	URANIUM-238	1.18	PCI/G	B	3.54	29.29	7.32
C1S1-11	SO-H-C1S1-11-C	1.5	2.5	URANIUM-238	1.177	PCI/G		3.53	29.21	7.30
C1S4-09	SO-H-C1S4-09-B	0.5	1.5	URANIUM-238	1.17	PCI/G	B	3.51	29.04	7.26
C1S3-05	SO-H-C1S3-05-C	1.5	2.5	URANIUM-238	1.167	PCI/G	B	3.50	28.96	7.24
HOTSPOT-04	SO-H-HTSP-04-C	1.5	2.5	URANIUM-238	1.155	PCI/G	B	3.47	28.67	7.17
C1S2-07	SO-H-C1S2-07-C	1.5	2.5	URANIUM-238	1.153	PCI/G		3.46	28.62	7.15
C1S2-12	SO-H-C1S2-12-A	0	0.5	URANIUM-238	1.153	PCI/G		3.46	28.62	7.15
HOTSPOT-02	SO-H-HTSP-01-A	0	0.5	URANIUM-238	1.141	PCI/G	B	3.43	28.32	7.08
C1S2-13	SO-H-C1S2-13-C	1.5	2.5	URANIUM-238	1.139	PCI/G		3.42	28.27	7.07
C1S3-06	SO-H-C1S3-06-C	1.5	2.5	URANIUM-238	1.137	PCI/G	B	3.41	28.22	7.05
C1S2-10	SO-H-C1S2-10-B	0.5	1.5	URANIUM-238	1.136	PCI/G	J	3.41	28.19	7.05
C1S2-10	SO-H-C1S2-10-C	1.5	2.5	URANIUM-238	1.134	PCI/G		3.41	28.14	7.04
HOTSPOT-03	SO-H-HTSP-03-A	0	0.5	URANIUM-238	1.131	PCI/G		3.40	28.07	7.02
HOTSPOT-01	SO-H-HTSP-01A-B	0.5	1.5	URANIUM-238	1.13	PCI/G		3.39	28.04	7.01
C1S2-14	SO-H-C1S2-14-A	0	0.5	URANIUM-238	1.126	PCI/G		3.38	27.95	6.99
C1S4-11	SO-H-C1S4-11-B	0.5	1.5	URANIUM-238	1.124	PCI/G	B	3.38	27.90	6.97
C2-17	SO-H-C2-17-C	1.5	2.5	URANIUM-238	1.12	PCI/G		3.36	27.80	6.95
C1S1-14	SO-H-C1S1-14-C	1.5	2.5	URANIUM-238	1.119	PCI/G	B	3.36	27.77	6.94
HOTSPOT-05	SO-H-HTSP-05-C	1.5	2.5	URANIUM-238	1.117	PCI/G	B	3.35	27.72	6.93
C1S2-01	SO-H-C1S2-01-B	0.5	1.5	URANIUM-238	1.114	PCI/G	B	3.35	27.65	6.91
C1S2-01	SO-H-C1S2-01-A	0	0.5	URANIUM-238	1.112	PCI/G	B	3.34	27.60	6.90
C1S3-08	SO-H-C1S3-08-C	1.5	2.5	URANIUM-238	1.11	PCI/G	B	3.33	27.55	6.89
C1S2-05	SO-H-C1S2-05-B	0.5	1.5	URANIUM-238	1.109	PCI/G	B	3.33	27.52	6.88
C1S4-05	SO-H-C1S4-05-C	1.5	2.5	URANIUM-238	1.106	PCI/G	B	3.32	27.45	6.86
C1S3-12	SO-H-C1S3-12-A	0	0.5	URANIUM-238	1.105	PCI/G	B	3.32	27.42	6.86
HOTSPOT-10	SO-H-HTSP-10-B	0.5	1.5	URANIUM-238	1.099	PCI/G		3.30	27.28	6.82
C1S3-14	SO-H-C1S3-14-C-D	1.5	2.5	URANIUM-238	1.094	PCI/G		3.29	27.15	6.79
C1S2-05	SO-H-C1S2-05-A	0	0.5	URANIUM-238	1.092	PCI/G	B	3.28	27.10	6.78
C1S4-05	SO-H-C1S4-05-B-D	0.5	1.5	URANIUM-238	1.089	PCI/G		3.27	27.03	6.76
C1S1-13	SO-H-C1S1-13-C	1.5	2.5	URANIUM-238	1.08	PCI/G		3.24	26.80	6.70
C1S4-04	SO-H-C1S4-04-B	0.5	1.5	URANIUM-238	1.077	PCI/G	B	3.23	26.73	6.68
HOTSPOT-09	SO-H-HTSP-09-A	0	0.5	URANIUM-238	1.073	PCI/G		3.22	26.63	6.66
HOTSPOT-11	SO-H-HTSP-11-B-D	0.5	1.5	URANIUM-238	1.06	PCI/G		3.18	26.31	6.58
C1S2-09	SO-H-C1S2-09-A	0	0.5	URANIUM-238	1.056	PCI/G		3.17	26.21	6.55
HOTSPOT-11	SO-H-HTSP-11-B	0.5	1.5	URANIUM-238	1.05	PCI/G		3.15	26.06	6.51
C1S2-16	SO-H-C1S2-16-C	1.5	2.5	URANIUM-238	1.042	PCI/G		3.13	25.86	6.47
C1S1-12	SO-H-C1S1-12-C	1.5	2.5	URANIUM-238	1.041	PCI/G	B	3.13	25.84	6.46
HOTSPOT-10	SO-H-HTSP-10-C	1.5	2.5	URANIUM-238	1.041	PCI/G		3.13	25.84	6.46
C1S3-01	SO-H-C1S3-01-C	2	3	URANIUM-238	1.04	PCI/G	B	3.12	25.81	6.45
HOTSPOT-12	SO-H-HTSP-12-B	0.5	1.5	URANIUM-238	1.04	PCI/G		3.12	25.81	6.45
HOTSPOT-11	SO-H-HTSP-11-A-D	0	0.5	URANIUM-238	1.03	PCI/G		3.09	25.56	6.39
C1S3-03	SO-H-C1S3-03-C	1.5	2.5	URANIUM-238	1.018	PCI/G		3.06	25.26	6.32
C1S3-13	SO-H-C1S3-13-C	1.5	2.5	URANIUM-238	1.018	PCI/G		3.06	25.26	6.32

C1S2-14	SO-H-C1S2-14-A-D	0	0.5	URANIUM-238	1.014	PCI/G		3.05	25.17	6.29
C1S4-11	SO-H-C1S4-11-C	1.5	2.5	URANIUM-238	1.004	PCI/G	B	3.02	24.92	6.23
HOTSPOT-06	SO-H-HTSP-06-B	0.5	1.5	URANIUM-238	0.989	PCI/G	J	2.97	24.55	6.14
C1S1-02	SO-H-C1S1-02-A	0	0.5	URANIUM-238	0.985	PCI/G		2.96	24.45	6.11
C1S2-14	SO-H-C1S2-14-B-D	0.5	1.5	URANIUM-238	0.984	PCI/G		2.95	24.42	6.11
C2-14	SO-H-C2-14-C	1.5	2.5	URANIUM-238	0.964	PCI/G		2.89	23.92	5.98
C1S1-01	SO-H-C1S1-01-B	0.5	1.5	URANIUM-238	0.959	PCI/G	B	2.88	23.80	5.95
C1S4-05	SO-H-C1S4-05-C-D	1.5	2.5	URANIUM-238	0.956	PCI/G		2.87	23.73	5.93
C1S1-05	SO-H-C1S1-05-B	0.5	1.5	URANIUM-238	0.952	PCI/G		2.86	23.63	5.91
C1S2-02	SO-H-C1S2-02-A	0	0.5	URANIUM-238	0.946	PCI/G	B	2.84	23.48	5.87
C1S4-07	SO-H-C1S4-07-B	0.5	1.5	URANIUM-238	0.939	PCI/G		2.82	23.30	5.83
C1S3-08	SO-H-C1S3-08-B	0.5	1.5	URANIUM-238	0.934	PCI/G	B	2.80	23.18	5.80
C1S1-02	SO-H-C1S1-02-C	1.5	2.5	URANIUM-238	0.932	PCI/G		2.80	23.13	5.78
C1S1-01	SO-H-C1S1-01-A	0	0.5	URANIUM-238	0.93	PCI/G	B	2.79	23.08	5.77
C1S1-08	SO-H-C1S1-08-C	1.5	2.5	URANIUM-238	0.925	PCI/G		2.78	22.96	5.74
C1S2-12	SO-H-C1S2-12-B	0.5	1.5	URANIUM-238	0.921	PCI/G		2.77	22.86	5.71
C1S2-16	SO-H-C1S2-16-A-D	0	0.5	URANIUM-238	0.913	PCI/G		2.74	22.66	5.66
C1S1-13	SO-H-C1S1-13-C-D	1.5	2.5	URANIUM-238	0.906	PCI/G		2.72	22.49	5.62
HOTSPOT-02	SO-H-HTSP-01-A-D	0	0.5	URANIUM-238	0.905	PCI/G		2.72	22.46	5.62
C1S3-11	SO-H-C1S3-11-A	0	0.5	URANIUM-238	0.897	PCI/G	B	2.69	22.26	5.57
C1S1-08	SO-H-C1S1-08-A	0	0.5	URANIUM-238	0.896	PCI/G		2.69	22.24	5.56
C1S1-01	SO-H-C1S1-01-C	1.5	2.5	URANIUM-238	0.895	PCI/G	B	2.69	22.21	5.55
C2-05	SO-H-C2-05-C	1.5	2.5	URANIUM-238	0.895	PCI/G	B	2.69	22.21	5.55
C1S1-11	SO-H-C1S1-11-B	0.5	1.5	URANIUM-238	0.894	PCI/G		2.68	22.19	5.55
C1S3-04	SO-H-C1S3-04-A	0	0.5	URANIUM-238	0.89	PCI/G	B	2.67	22.09	5.52
C1S3-10	SO-H-C1S3-10-B-D	0.5	1.5	URANIUM-238	0.886	PCI/G	J	2.66	21.99	5.50
C1S1-02	SO-H-C1S1-02-B	0.5	1.5	URANIUM-238	0.88	PCI/G		2.64	21.84	5.46
C1S2-14	SO-H-C1S2-14-C-D	1.5	2.5	URANIUM-238	0.876	PCI/G		2.63	21.74	5.44
C1S3-10	SO-H-C1S3-10-C	1.5	2.5	URANIUM-238	0.873	PCI/G	J	2.62	21.67	5.42
C1S4-04	SO-H-C1S4-04-B-D	0.5	1.5	URANIUM-238	0.868	PCI/G	B	2.61	21.54	5.39
C2-07	SO-H-C2-07-C	3.5	4.5	URANIUM-238	0.864	PCI/G	B	2.59	21.44	5.36
C1S2-03	SO-H-C1S2-03-C	1.5	2.5	URANIUM-238	0.863	PCI/G		2.59	21.42	5.35
C1S3-13	SO-H-C1S3-13-B	0.5	1.5	URANIUM-238	0.862	PCI/G		2.59	21.39	5.35
C1S1-07	SO-H-C1S1-07-C	1.5	2.5	URANIUM-238	0.859	PCI/G		2.58	21.32	5.33
C1S4-04	SO-H-C1S4-04-C-D	1.5	2.5	URANIUM-238	0.858	PCI/G		2.58	21.29	5.32
C1S3-02	SO-H-C1S3-02-A-D	0	0.5	URANIUM-238	0.856	PCI/G		2.57	21.24	5.31
HOTSPOT-11	SO-H-HTSP-11-C-D	1.5	2.5	URANIUM-238	0.845	PCI/G		2.54	20.97	5.24
C1S3-10	SO-H-C1S3-10-A-D	0	0.5	URANIUM-238	0.842	PCI/G	J	2.53	20.90	5.22
C1S2-08	SO-H-C1S2-08-C	1.5	2.5	URANIUM-238	0.841	PCI/G		2.53	20.87	5.22
C1S3-03	SO-H-C1S3-03-B	0.5	1.5	URANIUM-238	0.839	PCI/G		2.52	20.82	5.21
C1S3-06	SO-H-C1S3-06-A	0	0.5	URANIUM-238	0.839	PCI/G	B	2.52	20.82	5.21
C1S4-02	SO-H-C1S4-02-C	1.5	2.5	URANIUM-238	0.839	PCI/G	B	2.52	20.82	5.21
C1S2-10	SO-H-C1S2-10-A-D	0	0.5	URANIUM-238	0.833	PCI/G		2.50	20.67	5.17
C1S2-02	SO-H-C1S2-02-C	4	5	URANIUM-238	0.83	PCI/G	B	2.49	20.60	5.15
C1S2-14	SO-H-C1S2-14-C	1.5	2.5	URANIUM-238	0.83	PCI/G		2.49	20.60	5.15
C1S3-06	SO-H-C1S3-06-B	0.5	1.5	URANIUM-238	0.83	PCI/G	B	2.49	20.60	5.15
C1S2-10	SO-H-C1S2-10-A	0	0.5	URANIUM-238	0.827	PCI/G		2.48	20.52	5.13
C2-06	SO-H-C2-06-C	1.5	2.5	URANIUM-238	0.821	PCI/G		2.47	20.38	5.09
C1S2-11	SO-H-C1S2-11-A	0	0.5	URANIUM-238	0.82	PCI/G		2.46	20.35	5.09
C1S2-08	SO-H-C1S2-08-A	0	0.5	URANIUM-238	0.819	PCI/G		2.46	20.33	5.08
C1S2-16	SO-H-C1S2-16-A	0	0.5	URANIUM-238	0.818	PCI/G		2.46	20.30	5.08
C1S1-13	SO-H-C1S1-13-B-D	0.5	1.5	URANIUM-238	0.816	PCI/G		2.45	20.25	5.06
C2-17	SO-H-C2-17-B	0.5	1.5	URANIUM-238	0.815	PCI/G		2.45	20.23	5.06
C1S4-03	SO-H-C1S4-03-A	0	0.5	URANIUM-238	0.802	PCI/G	B	2.41	19.90	4.98
HOTSPOT-06	SO-H-HTSP-06-A	0	0.5	URANIUM-238	0.802	PCI/G	B	2.41	19.90	4.98
HOTSPOT-01	SO-H-HTSP-01A-A	0	0.5	URANIUM-238	0.796	PCI/G		2.39	19.76	4.94
HOTSPOT-12	SO-H-HTSP-12-C	1.5	2.5	URANIUM-238	0.795	PCI/G		2.39	19.73	4.93
C1S1-11	SO-H-C1S1-11-A	0	0.5	URANIUM-238	0.794	PCI/G	B	2.38	19.71	4.93
HOTSPOT-09	SO-H-HTSP-09-C	1.5	2.5	URANIUM-238	0.793	PCI/G		2.38	19.68	4.92
C1S1-09	SO-H-C1S1-09-C	1.5	2.5	URANIUM-238	0.792	PCI/G		2.38	19.66	4.91
C1S2-07	SO-H-C1S2-07-A	0	0.5	URANIUM-238	0.792	PCI/G		2.38	19.66	4.91

C1S2-04	SO-H-C1S2-04-A-D	0	0.5	URANIUM-238	0.776	PCI/G		2.33	19.26	4.81
C1S3-14	SO-H-C1S3-14-A-D	0	0.5	URANIUM-238	0.774	PCI/G		2.32	19.21	4.80
C1S4-11	SO-H-C1S4-11-A	0	0.5	URANIUM-238	0.772	PCI/G	B	2.32	19.16	4.79
C1S2-04	SO-H-C1S2-04-C	1.5	2.5	URANIUM-238	0.77	PCI/G		2.31	19.11	4.78
C2-04	SO-H-C2-04-A	0	0.5	URANIUM-238	0.767	PCI/G		2.30	19.04	4.76
CP-02	SO-H-CP02-B	0.5	1.5	URANIUM-238	0.766	PCI/G		2.30	19.01	4.75
C1S2-06	SO-H-C1S2-06-C	1.5	2.5	URANIUM-238	0.765	PCI/G		2.30	18.99	4.75
C1S3-02	SO-H-C1S3-02-B	0.5	1.5	URANIUM-238	0.765	PCI/G	B	2.30	18.99	4.75
C1S2-04	SO-H-C1S2-04-B-D	0.5	1.5	URANIUM-238	0.763	PCI/G		2.29	18.94	4.73
C1S3-14	SO-H-C1S3-14-A	0	0.5	URANIUM-238	0.763	PCI/G		2.29	18.94	4.73
C1S3-08	SO-H-C1S3-08-A	0	0.5	URANIUM-238	0.762	PCI/G	B	2.29	18.91	4.73
C2-06	SO-H-C2-06-B	0.5	1.5	URANIUM-238	0.76	PCI/G		2.28	18.86	4.72
HOTSPOT-08	SO-H-HTSP-08-B	0.5	1.5	URANIUM-238	0.76	PCI/G	B	2.28	18.86	4.72
C1S1-10	SO-H-C1S1-10-C	1.5	2.5	URANIUM-238	0.758	PCI/G	B	2.28	18.81	4.70
C1S4-10	SO-H-C1S4-10-B	0.5	1.5	URANIUM-238	0.758	PCI/G	B	2.28	18.81	4.70
HOTSPOT-11	SO-H-HTSP-11-C	1.5	2.5	URANIUM-238	0.755	PCI/G		2.27	18.74	4.68
C2-04	SO-H-C2-04-C	1.5	2.5	URANIUM-238	0.753	PCI/G		2.26	18.69	4.67
C1S2-13	SO-H-C1S2-13-A	0	0.5	URANIUM-238	0.749	PCI/G		2.25	18.59	4.65
C1S1-13	SO-H-C1S1-13-B	0.5	1.5	URANIUM-238	0.748	PCI/G		2.25	18.56	4.64
C1S2-12	SO-H-C1S2-12-C	1.5	2.5	URANIUM-238	0.744	PCI/G		2.23	18.46	4.62
CP-02	SO-H-CP02-C	1.5	2.5	URANIUM-238	0.744	PCI/G		2.23	18.46	4.62
C1S1-06	SO-H-C1S1-06-C	1.5	2.5	URANIUM-238	0.742	PCI/G		2.23	18.42	4.60
C1S3-02	SO-H-C1S3-02-A	0	0.5	URANIUM-238	0.742	PCI/G		2.23	18.42	4.60
C1S4-13	SO-H-C1S4-13-A	0	0.5	URANIUM-238	0.741	PCI/G		2.23	18.39	4.60
C1S3-02	SO-H-C1S3-02-B-D	0.5	1.5	URANIUM-238	0.74	PCI/G		2.22	18.37	4.59
C1S3-02	SO-H-C1S3-02-C	1.5	2.5	URANIUM-238	0.737	PCI/G	B	2.21	18.29	4.57
C1S3-03	SO-H-C1S3-03-A	0	0.5	URANIUM-238	0.735	PCI/G		2.21	18.24	4.56
C1S3-01	SO-H-C1S3-01-A	0	0.5	URANIUM-238	0.727	PCI/G	B	2.18	18.04	4.51
C1S3-04	SO-H-C1S3-04-B	0.5	1.5	URANIUM-238	0.724	PCI/G	B	2.17	17.97	4.49
C1S4-01	SO-H-C1S4-01-B	0.5	1.5	URANIUM-238	0.719	PCI/G	B	2.16	17.84	4.46
C1S4-05	SO-H-C1S4-05-A	0	0.5	URANIUM-238	0.715	PCI/G	B	2.15	17.75	4.44
C2-03	SO-H-C2-03-C	1.5	2.5	URANIUM-238	0.715	PCI/G		2.15	17.75	4.44
CP-01	SO-H-CP01-A	0	0.5	URANIUM-238	0.713	PCI/G	B	2.14	17.70	4.42
C1S2-15	SO-H-C1S2-15-A	0	0.5	URANIUM-238	0.71	PCI/G		2.13	17.62	4.41
C1S1-12	SO-H-C1S1-12-B	0.5	1.5	URANIUM-238	0.709	PCI/G	B	2.13	17.60	4.40
C2-13	SO-H-C2-13-B	0.5	1.5	URANIUM-238	0.708	PCI/G		2.13	17.57	4.39
C1S4-02	SO-H-C1S4-02-B	0.5	1.5	URANIUM-238	0.707	PCI/G	B	2.12	17.55	4.39
HOTSPOT-08	SO-H-HTSP-08-A	0	0.5	URANIUM-238	0.707	PCI/G	B	2.12	17.55	4.39
C1S4-01	SO-H-C1S4-01-C	1.5	2.5	URANIUM-238	0.706	PCI/G	B	2.12	17.52	4.38
C1S4-04	SO-H-C1S4-04-A	0	0.5	URANIUM-238	0.703	PCI/G	B	2.11	17.45	4.36
CP-01	SO-H-CP01-C	1.5	2.5	URANIUM-238	0.701	PCI/G		2.11	17.40	4.35
C1S2-04	SO-H-C1S2-04-C-D	1.5	2.5	URANIUM-238	0.699	PCI/G		2.10	17.35	4.34
C1S2-11	SO-H-C1S2-11-B	0.5	1.5	URANIUM-238	0.696	PCI/G		2.09	17.27	4.32
C2-08	SO-H-C2-08-B	0.5	1.5	URANIUM-238	0.691	PCI/G		2.08	17.15	4.29
C1S1-06	SO-H-C1S1-06-B	0.5	1.5	URANIUM-238	0.69	PCI/G		2.07	17.12	4.28
C1S2-04	SO-H-C1S2-04-B	0.5	1.5	URANIUM-238	0.689	PCI/G		2.07	17.10	4.27
CP-01	SO-H-CP01-B	0.5	1.5	URANIUM-238	0.688	PCI/G		2.07	17.07	4.27
C1S2-04	SO-H-C1S2-04-A	0	0.5	URANIUM-238	0.685	PCI/G		2.06	17.00	4.25
C1S4-03	SO-H-C1S4-03-C	1.5	2.5	URANIUM-238	0.68	PCI/G	B	2.04	16.88	4.22
C1S1-10	SO-H-C1S1-10-A	0	0.5	URANIUM-238	0.679	PCI/G	B	2.04	16.85	4.21
C1S1-03	SO-H-C1S1-03-B	0.5	1.5	URANIUM-238	0.677	PCI/G	B	2.03	16.80	4.20
C1S4-06	SO-H-C1S4-06-A	0	0.5	URANIUM-238	0.676	PCI/G	B	2.03	16.78	4.19
C2-09	SO-H-C2-09-C	1.5	2.5	URANIUM-238	0.676	PCI/G		2.03	16.78	4.19
C1S1-05	SO-H-C1S1-05-A	0	0.5	URANIUM-238	0.674	PCI/G		2.02	16.73	4.18
C1S1-09	SO-H-C1S1-09-B	0.5	1.5	URANIUM-238	0.674	PCI/G		2.02	16.73	4.18
C1S2-09	SO-H-C1S2-09-C	1.5	2.5	URANIUM-238	0.674	PCI/G		2.02	16.73	4.18
C2-05	SO-H-C2-05-B	0.5	1.5	URANIUM-238	0.665	PCI/G	B	2.00	16.50	4.13
C1S3-13	SO-H-C1S3-13-A	0	0.5	URANIUM-238	0.663	PCI/G		1.99	16.45	4.11
C2-11	SO-H-C2-11-B	0.5	1.5	URANIUM-238	0.66	PCI/G	B	1.98	16.38	4.10
C2-11	SO-H-C2-11-A	0	0.5	URANIUM-238	0.656	PCI/G	B	1.97	16.28	4.07
C1S4-09	SO-H-C1S4-09-A	0	0.5	URANIUM-238	0.652	PCI/G	B	1.96	16.18	4.05

C2-10	SO-H-C2-10-A	0	0.5	URANIUM-238	0.652	PCI/G		1.96	16.18	4.05
C1S4-09	SO-H-C1S4-09-A-D	0	0.5	URANIUM-238	0.65	PCI/G		1.95	16.13	4.03
C2-13	SO-H-C2-13-A	0	0.5	URANIUM-238	0.648	PCI/G		1.95	16.08	4.02
C1S3-07	SO-H-C1S3-07-A	0	0.5	URANIUM-238	0.647	PCI/G	B	1.94	16.06	4.01
C2-02	SO-H-C2-02-B	0.5	1.5	URANIUM-238	0.646	PCI/G	B	1.94	16.03	4.01
C2-09	SO-H-C2-09-A	0	0.5	URANIUM-238	0.646	PCI/G		1.94	16.03	4.01
C2-10	SO-H-C2-10-C	1.5	2.5	URANIUM-238	0.646	PCI/G		1.94	16.03	4.01
C2-08	SO-H-C2-08-C	1.5	2.5	URANIUM-238	0.643	PCI/G		1.93	15.96	3.99
C1S4-04	SO-H-C1S4-04-A-D	0	0.5	URANIUM-238	0.639	PCI/G	B	1.92	15.86	3.96
C1S3-10	SO-H-C1S3-10-A	0	0.5	URANIUM-238	0.638	PCI/G	J	1.92	15.83	3.96
C1S3-09	SO-H-C1S3-09-A	0	0.5	URANIUM-238	0.637	PCI/G		1.91	15.81	3.95
C2-06	SO-H-C2-06-A	0	0.5	URANIUM-238	0.636	PCI/G		1.91	15.78	3.95
C2-03	SO-H-C2-03-A	0	0.5	URANIUM-238	0.635	PCI/G		1.91	15.76	3.94
C1S2-06	SO-H-C1S2-06-A	0	0.5	URANIUM-238	0.634	PCI/G		1.90	15.73	3.93
C1S4-01	SO-H-C1S4-01-A	0	0.5	URANIUM-238	0.627	PCI/G	B	1.88	15.56	3.89
C1S3-02	SO-H-C1S3-02-C-D	1.5	2.5	URANIUM-238	0.624	PCI/G		1.87	15.49	3.87
C2-01	SO-H-C2-01-B-D	0.5	1.5	URANIUM-238	0.618	PCI/G		1.86	15.34	3.83
C1S3-05	SO-H-C1S3-05-A-D	0	0.5	URANIUM-238	0.613	PCI/G	B	1.84	15.21	3.80
C1S4-02	SO-H-C1S4-02-A	0	0.5	URANIUM-238	0.613	PCI/G	J	1.84	15.21	3.80
C2-01	SO-H-C2-01-C-D	1.5	2.5	URANIUM-238	0.612	PCI/G		1.84	15.19	3.80
C1S1-07	SO-H-C1S1-07-A	0	0.5	URANIUM-238	0.61	PCI/G		1.83	15.14	3.78
C1S4-14	SO-H-C1S4-14-B	0.5	1.5	URANIUM-238	0.606	PCI/G		1.82	15.04	3.76
C1S1-03	SO-H-C1S1-03-A	0	0.5	URANIUM-238	0.605	PCI/G	B	1.82	15.02	3.75
C1S3-05	SO-H-C1S3-05-A	0	0.5	URANIUM-238	0.602	PCI/G	J	1.81	14.94	3.74
C2-03	SO-H-C2-03-B	0.5	1.5	URANIUM-238	0.602	PCI/G		1.81	14.94	3.74
C1S1-04	SO-H-C1S1-04-A	0	0.5	URANIUM-238	0.598	PCI/G		1.80	14.84	3.71
C1S1-13	SO-H-C1S1-13-A	0	0.5	URANIUM-238	0.597	PCI/G		1.79	14.82	3.70
C1S4-05	SO-H-C1S4-05-A-D	0	0.5	URANIUM-238	0.597	PCI/G		1.79	14.82	3.70
C1S2-03	SO-H-C1S2-03-A	0	0.5	URANIUM-238	0.595	PCI/G		1.79	14.77	3.69
C1S1-04	SO-H-C1S1-04-B	0.5	1.5	URANIUM-238	0.594	PCI/G		1.78	14.74	3.69
C2-01	SO-H-C2-01-A-D	0	0.5	URANIUM-238	0.59	PCI/G		1.77	14.64	3.66
C2-08	SO-H-C2-08-A	0	0.5	URANIUM-238	0.589	PCI/G		1.77	14.62	3.65
HOTSPOT-09	SO-H-HTSP-09-B	0.5	1.5	URANIUM-238	0.588	PCI/G		1.77	14.59	3.65
C1S3-01	SO-H-C1S3-01-B	0.5	1.5	URANIUM-238	0.586	PCI/G	B	1.76	14.54	3.64
C1S2-11	SO-H-C1S2-11-C	1.5	2.5	URANIUM-238	0.585	PCI/G		1.76	14.52	3.63
C2-02	SO-H-C2-02-A	0	0.5	URANIUM-238	0.585	PCI/G	B	1.76	14.52	3.63
C1S3-09	SO-H-C1S3-09-B	0.5	1.5	URANIUM-238	0.583	PCI/G		1.75	14.47	3.62
C1S4-10	SO-H-C1S4-10-A	0	0.5	URANIUM-238	0.581	PCI/G	B	1.74	14.42	3.60
C2-11	SO-H-C2-11-C	2.5	3.5	URANIUM-238	0.58	PCI/G	B	1.74	14.39	3.60
C1S1-14	SO-H-C1S1-14-A	0	0.5	URANIUM-238	0.57	PCI/G	B	1.71	14.15	3.54
C1S4-07	SO-H-C1S4-07-A	0	0.5	URANIUM-238	0.568	PCI/G		1.71	14.10	3.52
C1S4-03	SO-H-C1S4-03-B	0.5	1.5	URANIUM-238	0.564	PCI/G	B	1.69	14.00	3.50
C2-01	SO-H-C2-01-C	1.5	2.5	URANIUM-238	0.563	PCI/G		1.69	13.97	3.49
C2-09	SO-H-C2-09-B	0.5	1.5	URANIUM-238	0.563	PCI/G		1.69	13.97	3.49
C2-07	SO-H-C2-07-A	0	0.5	URANIUM-238	0.55	PCI/G	B	1.65	13.65	3.41
C2-02	SO-H-C2-02-C	1.5	2.5	URANIUM-238	0.549	PCI/G	B	1.65	13.63	3.41
C2-15	SO-H-C2-15-B	0.5	1.5	URANIUM-238	0.544	PCI/G		1.63	13.50	3.38
C1S2-03	SO-H-C1S2-03-B	0.5	1.5	URANIUM-238	0.542	PCI/G		1.63	13.45	3.36
C2-01	SO-H-C2-01-B	0.5	1.5	URANIUM-238	0.526	PCI/G		1.58	13.05	3.26
C2-14	SO-H-C2-14-A	0	0.5	URANIUM-238	0.525	PCI/G		1.58	13.03	3.26
C2-16	SO-H-C2-16-C	1.5	2.5	URANIUM-238	0.524	PCI/G		1.57	13.00	3.25
C1S1-06	SO-H-C1S1-06-B-D	0.5	1.5	URANIUM-238	0.521	PCI/G		1.56	12.93	3.23
C2-07	SO-H-C2-07-B	0.5	1.5	URANIUM-238	0.518	PCI/G	B	1.56	12.86	3.21
C1S1-06	SO-H-C1S1-06-A	0	0.5	URANIUM-238	0.512	PCI/G		1.54	12.71	3.18
C2-15	SO-H-C2-15-A	0	0.5	URANIUM-238	0.508	PCI/G		1.53	12.61	3.15
C1S4-04	SO-H-C1S4-04-C	1.5	2.5	URANIUM-238	0.507	PCI/G	B	1.52	12.58	3.15
C1S1-09	SO-H-C1S1-09-A	0	0.5	URANIUM-238	0.502	PCI/G		1.51	12.46	3.11
C2-05	SO-H-C2-05-A	0	0.5	URANIUM-238	0.501	PCI/G	B	1.50	12.43	3.11
C2-10	SO-H-C2-10-B	0.5	1.5	URANIUM-238	0.501	PCI/G		1.50	12.43	3.11
C1S4-08	SO-H-C1S4-08-A	0	0.5	URANIUM-238	0.499	PCI/G		1.50	12.38	3.10
HOTSPOT-08	SO-H-HTSP-08-C	1.5	2.5	URANIUM-238	0.466	PCI/G	B	1.40	11.57	2.89

C1S1-14	SO-H-C1S1-14-B	0.5	1.5	URANIUM-238	0.459	PCI/G	J	1.38	11.39	2.85
C2-16	SO-H-C2-16-B	0.5	1.5	URANIUM-238	0.459	PCI/G		1.38	11.39	2.85
C1S1-06	SO-H-C1S1-06-A-D	0	0.5	URANIUM-238	0.454	PCI/G		1.36	11.27	2.82
C2-01	SO-H-C2-01-A	0	0.5	URANIUM-238	0.448	PCI/G		1.35	11.12	2.78
CP-02	SO-H-CP02-A	0	0.5	URANIUM-238	0.434	PCI/G		1.30	10.77	2.69
C2-15	SO-H-C2-15-C	1.5	2.5	URANIUM-238	0.432	PCI/G		1.30	10.72	2.68
C1S1-12	SO-H-C1S1-12-A	0	0.5	URANIUM-238	0.43	PCI/G	J	1.29	10.67	2.67
C1S4-14	SO-H-C1S4-14-A	0	0.5	URANIUM-238	0.385	PCI/G		1.16	9.56	2.39
C2-14	SO-H-C2-14-B	0.5	1.5	URANIUM-238	0.347	PCI/G		1.04	8.61	2.15

APPENDIX F
ProUCL Output Files

Exposure Unit and Background UTL and BTV Output (Soils)

Background Statistics for Uncensored Full Data Sets

User Selected Options

Date/Time of Computation	ProUCL 5.19/15/2020 09:48:15
From File	C:\Users\h5tderjc\Desktop\NFSS\02 - VPH\13 - Risk Assessment\VPH EU\Site EU Data.xlsx
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
New or Future K Observations	1
Number of Bootstrap Operations	2000

Ra226 SS

General Statistics

Total Number of Observations	89	Number of Distinct Observations	88
Minimum	0.229	First Quartile	0.786
Second Largest	17.2	Median	0.934
Maximum	22.64	Third Quartile	1.161
Mean	1.704	SD	3.088
Coefficient of Variation	1.812	Skewness	5.302
Mean of logged Data	0.0927	SD of logged Data	0.726

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	1.942	d2max (for USL)	3.169

Normal GOF Test

Shapiro Wilk Test Statistic	0.366	**Normal GOF Test**
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.389	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0941	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	7.701	90% Percentile (z)	5.661
	95% UPL (t)	6.866	95% Percentile (z)	6.783
	95% USL	11.49	99% Percentile (z)	8.888

Gamma GOF Test

A-D Test Statistic	12.69	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.776	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.333	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.097	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.276	k star (bias corrected MLE)	1.241
Theta hat (MLE)	1.336	Theta star (bias corrected MLE)	1.374
nu hat (MLE)	227.1	nu star (bias corrected)	220.8

MLE Mean (bias corrected)	1.704	MLE Sd (bias corrected)	1.53

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	4.378	90% Percentile	3.721
95% Hawkins Wixley (HW) Approx. Gamma UPL	4.162	95% Percentile	4.735
95% WH Approx. Gamma UTL with 95% Coverage	5.159	99% Percentile	7.055
95% HW Approx. Gamma UTL with 95% Coverage	4.939		
95% WH USL	9.874	95% HW USL	9.906

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.784	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.255	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.0941	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	4.492	90% Percentile (z)	2.781
95% UPL (t)	3.691	95% Percentile (z)	3.62
95% USL	10.95	99% Percentile (z)	5.937

Nonparametric Distribution Free Background Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	87	95% UTL with 95% Coverage	8.753
Approx, f used to compute achieved CC	1.526	Approximate Actual Confidence Coefficient achieved by UTL	0.828
		Approximate Sample Size needed to achieve specified CC	124
95% Percentile Bootstrap UTL with 95% Coverage	12.72	95% BCA Bootstrap UTL with 95% Coverage	8.753
95% UPL	6.339	90% Percentile	2.874
90% Chebyshev UPL	11.02	95% Percentile	5.202
95% Chebyshev UPL	15.24	99% Percentile	17.86
95% USL	22.64		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.

The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Ra228 SS

General Statistics

Total Number of Observations	89	Number of Distinct Observations	87
Minimum	0.106	First Quartile	0.632
Second Largest	1.41	Median	0.826
Maximum	1.418	Third Quartile	1.031

Mean	0.815	SD	0.301
Coefficient of Variation	0.37	Skewness	-0.168
Mean of logged Data	-0.298	SD of logged Data	0.488

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	1.942	d2max (for USL)	3.169

Normal GOF Test

Shapiro Wilk Test Statistic	0.974	**Normal GOF Test**
5% Shapiro Wilk P Value	0.301	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.0611	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0941	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	1.401	90% Percentile (z)	1.201
95% UPL (t)	1.319	95% Percentile (z)	1.311
95% USL	1.771	99% Percentile (z)	1.516

Gamma GOF Test

A-D Test Statistic	1.387	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.754	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.102	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.095	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	5.519	k star (bias corrected MLE)	5.34
Theta hat (MLE)	0.148	Theta star (bias corrected MLE)	0.153
nu hat (MLE)	982.3	nu star (bias corrected)	950.6
MLE Mean (bias corrected)	0.815	MLE Sd (bias corrected)	0.353

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	1.474	90% Percentile	1.287
95% Hawkins Wixley (HW) Approx. Gamma UPL	1.511	95% Percentile	1.468
95% WH Approx. Gamma UTL with 95% Coverage	1.617	99% Percentile	1.85
95% HW Approx. Gamma UTL with 95% Coverage	1.67		
95% WH USL	2.387	95% HW USL	2.557

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.867	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk P Value	4.676E-11	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.123	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.0941	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with	95% Coverage	1.915	90% Percentile (z)		1.387
	95% UPL (t)	1.678	95% Percentile (z)		1.656
	95% USL	3.485	99% Percentile (z)		2.31

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r		87	95% UTL with	95% Coverage	1.381
Approx, f used to compute achieved CC		1.526	Approximate Actual Confidence Coefficient achieved by UTL		0.828
			Approximate Sample Size needed to achieve specified CC		124
95% Percentile Bootstrap UTL with	95% Coverage	1.381	95% BCA Bootstrap UTL with	95% Coverage	1.381
	95% UPL	1.328		90% Percentile	1.198
	90% Chebyshev UPL	1.725		95% Percentile	1.283
	95% Chebyshev UPL	2.137		99% Percentile	1.411
	95% USL	1.418			

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Th228 SS

General Statistics

Total Number of Observations	89	Number of Distinct Observations	84
Minimum	0.059	First Quartile	0.669
Second Largest	1.38	Median	0.812
Maximum	1.532	Third Quartile	0.93
Mean	0.79	SD	0.261
Coefficient of Variation	0.33	Skewness	-0.401
Mean of logged Data	-0.329	SD of logged Data	0.533

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	1.942	d2max (for USL)	3.169

Normal GOF Test

Shapiro Wilk Test Statistic	0.951	**Normal GOF Test**	
5% Shapiro Wilk P Value	0.00676	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.125	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0941	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	1.297	90% Percentile (z)		1.124
	95% UPL (t)	1.226	95% Percentile (z)		1.219

95% USL	1.617	99% Percentile (z)	1.397

Gamma GOF Test

A-D Test Statistic	5.089	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.754	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.202	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.095	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	5.511	k star (bias corrected MLE)	5.333
Theta hat (MLE)	0.143	Theta star (bias corrected MLE)	0.148
nu hat (MLE)	981	nu star (bias corrected)	949.3
MLE Mean (bias corrected)	0.79	MLE Sd (bias corrected)	0.342

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	1.423	90% Percentile	1.248
95% Hawkins Wixley (HW) Approx. Gamma UPL	1.477	95% Percentile	1.423
95% WH Approx. Gamma UTL with 95% Coverage	1.56	99% Percentile	1.794
95% HW Approx. Gamma UTL with 95% Coverage	1.635		
95% WH USL	2.294	95% HW USL	2.51

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.706	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.231	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.0941	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	2.024	90% Percentile (z)	1.424
95% UPL (t)	1.753	95% Percentile (z)	1.728
95% USL	3.892	99% Percentile (z)	2.484

Nonparametric Distribution Free Background Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	87	95% UTL with 95% Coverage	1.316
Approx, f used to compute achieved CC	1.526	Approximate Actual Confidence Coefficient achieved by UTL	0.828
		Approximate Sample Size needed to achieve specified CC	124
95% Percentile Bootstrap UTL with 95% Coverage	1.328	95% BCA Bootstrap UTL with 95% Coverage	1.316
95% UPL	1.268	90% Percentile	1.015
90% Chebyshev UPL	1.577	95% Percentile	1.215
95% Chebyshev UPL	1.933	99% Percentile	1.398
95% USL	1.532		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Th230 SS

General Statistics

Total Number of Observations	89	Number of Distinct Observations	88
Minimum	0.243	First Quartile	0.674
Second Largest	7.76	Median	0.87
Maximum	26.88	Third Quartile	1.096
Mean	1.325	SD	2.878
Coefficient of Variation	2.171	Skewness	8.277
Mean of logged Data	-0.0812	SD of logged Data	0.612

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	1.942	d2max (for USL)	3.169

Normal GOF Test

Shapiro Wilk Test Statistic	0.248	**Normal GOF Test**
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.377	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0941	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	6.914	90% Percentile (z)	5.013
	95% UPL (t)	6.136	95% Percentile (z)	6.058
	95% USL	10.45	99% Percentile (z)	8.02

Gamma GOF Test

A-D Test Statistic	10.16	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.771	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.274	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.0965	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.523	k star (bias corrected MLE)	1.48
Theta hat (MLE)	0.87	Theta star (bias corrected MLE)	0.896
nu hat (MLE)	271.2	nu star (bias corrected)	263.4
MLE Mean (bias corrected)	1.325	MLE Sd (bias corrected)	1.089

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	3.144	90% Percentile	2.771

95% Hawkins Wixley (HW) Approx. Gamma UPL	2.946	95% Percentile	3.468
95% WH Approx. Gamma UTL with 95% Coverage	3.656	99% Percentile	5.044
95% HW Approx. Gamma UTL with 95% Coverage	3.435		
95% WH USL	6.684	95% HW USL	6.46

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.835	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk P Value	2.454E-14	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.173	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.0941	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	3.026	90% Percentile (z)	2.02
95% UPL (t)	2.564	95% Percentile (z)	2.523
95% USL	6.412	99% Percentile (z)	3.828

Nonparametric Distribution Free Background Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	87	95% UTL with 95% Coverage	4.099
Approx, f used to compute achieved CC	1.526	Approximate Actual Confidence Coefficient achieved by UTL	0.828
		Approximate Sample Size needed to achieve specified CC	124
95% Percentile Bootstrap UTL with 95% Coverage	5.678	95% BCA Bootstrap UTL with 95% Coverage	4.099
95% UPL	2.222	90% Percentile	1.59
90% Chebyshev UPL	10.01	95% Percentile	1.867
95% Chebyshev UPL	13.94	99% Percentile	10.05
95% USL	26.88		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Th232 SS

General Statistics

Total Number of Observations	89	Number of Distinct Observations	83
Minimum	0.111	First Quartile	0.604
Second Largest	1.381	Median	0.715
Maximum	1.517	Third Quartile	0.849
Mean	0.731	SD	0.26
Coefficient of Variation	0.356	Skewness	0.228
Mean of logged Data	-0.395	SD of logged Data	0.452

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	1.942	d2max (for USL)	3.169

Normal GOF Test

Shapiro Wilk Test Statistic	0.964	**Normal GOF Test**
5% Shapiro Wilk P Value	0.0699	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.0974	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0941	Data Not Normal at 5% Significance Level

Data appear Approximate Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	1.237	90% Percentile (z)	1.065
	95% UPL (t)	1.166	95% Percentile (z)	1.159
	95% USL	1.557	99% Percentile (z)	1.337

Gamma GOF Test

A-D Test Statistic	2.447	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.754	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.152	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.0949	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	6.288	k star (bias corrected MLE)	6.084
Theta hat (MLE)	0.116	Theta star (bias corrected MLE)	0.12
nu hat (MLE)	1119	nu star (bias corrected)	1083
MLE Mean (bias corrected)	0.731	MLE Sd (bias corrected)	0.296

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL		1.281	90% Percentile	1.127
95% Hawkins Wixley (HW) Approx. Gamma UPL		1.309	95% Percentile	1.277
95% WH Approx. Gamma UTL with	95% Coverage	1.399	99% Percentile	1.59
95% HW Approx. Gamma UTL with	95% Coverage	1.439		
	95% WH USL	2.026	95% HW USL	2.153

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.859	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk P Value	7.735E-12	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.186	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.0941	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with	95% Coverage	1.62	90% Percentile (z)	1.202
	95% UPL (t)	1.433	95% Percentile (z)	1.416
	95% USL	2.819	99% Percentile (z)	1.927

Nonparametric Distribution Free Background Statistics

Data appear Approximate Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	87	95% UTL with 95% Coverage	1.304
Approx, f used to compute achieved CC	1.526	Approximate Actual Confidence Coefficient achieved by UTL	0.828
		Approximate Sample Size needed to achieve specified CC	124
95% Percentile Bootstrap UTL with 95% Coverage	1.33	95% BCA Bootstrap UTL with 95% Coverage	1.33
95% UPL	1.252	90% Percentile	1.075
90% Chebyshev UPL	1.517	95% Percentile	1.211
95% Chebyshev UPL	1.873	99% Percentile	1.397
95% USL	1.517		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

U234 SS

General Statistics

Total Number of Observations	88	Number of Distinct Observations	84
Minimum	0.253	First Quartile	0.616
Second Largest	1.92	Median	0.727
Maximum	3.793	Third Quartile	0.872
Mean	0.808	SD	0.429
Coefficient of Variation	0.531	Skewness	4.269
Mean of logged Data	-0.299	SD of logged Data	0.391

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	1.944	d2max (for USL)	3.165

Normal GOF Test

Shapiro Wilk Test Statistic	0.682	**Normal GOF Test**	
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.214	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0946	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	1.642	90% Percentile (z)	1.358
95% UPL (t)	1.526	95% Percentile (z)	1.514
95% USL	2.166	99% Percentile (z)	1.806

Gamma GOF Test

A-D Test Statistic	2.032	**Anderson-Darling Gamma GOF Test**

5% A-D Critical Value	0.754	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.143	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.0955	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	5.991	k star (bias corrected MLE)	5.794
Theta hat (MLE)	0.135	Theta star (bias corrected MLE)	0.139
nu hat (MLE)	1054	nu star (bias corrected)	1020
MLE Mean (bias corrected)	0.808	MLE Sd (bias corrected)	0.336

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	1.424	90% Percentile	1.257
95% Hawkins Wixley (HW) Approx. Gamma UPL	1.421	95% Percentile	1.428
95% WH Approx. Gamma UTL with 95% Coverage	1.559	99% Percentile	1.786
95% HW Approx. Gamma UTL with 95% Coverage	1.56		
95% WH USL	2.27	95% HW USL	2.319

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.961	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk P Value	0.0395	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.11	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.0946	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	1.587	90% Percentile (z)	1.225
95% UPL (t)	1.427	95% Percentile (z)	1.412
95% USL	2.559	99% Percentile (z)	1.843

Nonparametric Distribution Free Background Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	86	95% UTL with 95% Coverage	1.757
Approx, f used to compute achieved CC	1.509	Approximate Actual Confidence Coefficient achieved by UTL	0.822
		Approximate Sample Size needed to achieve specified CC	124
95% Percentile Bootstrap UTL with 95% Coverage	1.757	95% BCA Bootstrap UTL with 95% Coverage	1.757
95% UPL	1.388	90% Percentile	1.17
90% Chebyshev UPL	2.103	95% Percentile	1.346
95% Chebyshev UPL	2.689	99% Percentile	2.163
95% USL	3.793		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data

represents a background data set and when many onsite observations need to be compared with the BTV.

U235 SS

General Statistics

Total Number of Observations	88	Number of Distinct Observations	57
Minimum	-0.087	First Quartile	0.0118
Second Largest	0.101	Median	0.0235
Maximum	0.108	Third Quartile	0.0423
Mean	0.0275	SD	0.0277
Coefficient of Variation	1.008	Skewness	-0.0907

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	1.944	d2max (for USL)	3.165

Normal GOF Test

Shapiro Wilk Test Statistic	0.94	**Normal GOF Test**	
5% Shapiro Wilk P Value	7.1688E-4	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.141	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0946	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	0.0813	90% Percentile (z)		0.0629
	95% UPL (t)	0.0737	95% Percentile (z)		0.073
	95% USL	0.115	99% Percentile (z)		0.0919

Gamma Statistics

Gamma Statistics Not Available

Dataset Contains Values <= 0 - Cannot Compute Gamma Statistics

Dataset Contains Values <= 0 - Cannot Compute Log Statistics

Nonparametric Distribution Free Background Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r		86	95% UTL with	95% Coverage	0.092
Approx, f used to compute achieved CC		1.509	Approximate Actual Confidence Coefficient achieved by UTL		0.822
			Approximate Sample Size needed to achieve specified CC		124
95% Percentile Bootstrap UTL with	95% Coverage	0.092	95% BCA Bootstrap UTL with	95% Coverage	0.092
	95% UPL	0.0823		90% Percentile	0.0589
	90% Chebyshev UPL	0.111		95% Percentile	0.0762
	95% Chebyshev UPL	0.149		99% Percentile	0.102
	95% USL	0.108			

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

U238 SS

General Statistics

Total Number of Observations	88	Number of Distinct Observations	85
Minimum	0.275	First Quartile	0.612
Second Largest	2.242	Median	0.721
Maximum	4.051	Third Quartile	0.896
Mean	0.831	SD	0.457
Coefficient of Variation	0.55	Skewness	4.559
Mean of logged Data	-0.27	SD of logged Data	0.376

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	1.944	d2max (for USL)	3.165

Normal GOF Test

Shapiro Wilk Test Statistic	0.636	**Normal GOF Test**
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.206	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0946	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	1.719	90% Percentile (z)	1.416
	95% UPL (t)	1.595	95% Percentile (z)	1.582
	95% USL	2.277	99% Percentile (z)	1.894

Gamma GOF Test

A-D Test Statistic	3.013	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.754	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.149	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.0955	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	6.113	k star (bias corrected MLE)	5.913
Theta hat (MLE)	0.136	Theta star (bias corrected MLE)	0.14
nu hat (MLE)	1076	nu star (bias corrected)	1041
MLE Mean (bias corrected)	0.831	MLE Sd (bias corrected)	0.342

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	1.454	90% Percentile	1.287

95% Hawkins Wixley (HW) Approx. Gamma UPL	1.446	95% Percentile	1.46
95% WH Approx. Gamma UTL with 95% Coverage	1.591	99% Percentile	1.823
95% HW Approx. Gamma UTL with 95% Coverage	1.585		
95% WH USL	2.31	95% HW USL	2.342

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.937	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk P Value	4.2637E-4	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.113	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.0946	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	1.586	90% Percentile (z)	1.236
95% UPL (t)	1.432	95% Percentile (z)	1.417
95% USL	2.511	99% Percentile (z)	1.831

Nonparametric Distribution Free Background Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	86	95% UTL with 95% Coverage	1.704
Approx, f used to compute achieved CC	1.509	Approximate Actual Confidence Coefficient achieved by UTL	0.822
		Approximate Sample Size needed to achieve specified CC	124
95% Percentile Bootstrap UTL with 95% Coverage	1.92	95% BCA Bootstrap UTL with 95% Coverage	1.704
95% UPL	1.475	90% Percentile	1.145
90% Chebyshev UPL	2.21	95% Percentile	1.314
95% Chebyshev UPL	2.834	99% Percentile	2.477
95% USL	4.051		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Ra226 SB

General Statistics

Total Number of Observations	178	Number of Distinct Observations	171
Minimum	0.431	First Quartile	0.835
Second Largest	101.3	Median	1.057
Maximum	155.2	Third Quartile	1.339
Mean	2.832	SD	13.77
Coefficient of Variation	4.86	Skewness	9.828
Mean of logged Data	0.201	SD of logged Data	0.726

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	1.848	d2max (for USL)	3.397

Normal GOF Test

Shapiro Wilk Test Statistic	0.148	**Normal GOF Test**
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.431	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0668	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	28.27	90% Percentile (z)	20.47
	95% UPL (t)	25.66	95% Percentile (z)	25.48
	95% USL	49.59	99% Percentile (z)	34.86

Gamma GOF Test

A-D Test Statistic	5.618E+28	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.799	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.346	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.0723	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.717	k star (bias corrected MLE)	0.709
Theta hat (MLE)	3.95	Theta star (bias corrected MLE)	3.997
nu hat (MLE)	255.3	nu star (bias corrected)	252.3
MLE Mean (bias corrected)	2.832	MLE Sd (bias corrected)	3.364

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL		6.859	90% Percentile	7.089
95% Hawkins Wixley (HW) Approx. Gamma UPL		5.839	95% Percentile	9.598
95% WH Approx. Gamma UTL with	95% Coverage	7.882	99% Percentile	15.58
95% HW Approx. Gamma UTL with	95% Coverage	6.712		
	95% WH USL	20.23	95% HW USL	17.96

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.716	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.206	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.0668	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with	95% Coverage	4.682	90% Percentile (z)	3.102
	95% UPL (t)	4.078	95% Percentile (z)	4.039
	95% USL	14.42	99% Percentile (z)	6.627

Nonparametric Distribution Free Background Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	173	95% UTL with 95% Coverage	6.089
Approx, f used to compute achieved CC	1.518	Approximate Actual Confidence Coefficient achieved by UTL	0.884
		Approximate Sample Size needed to achieve specified CC	208
95% Percentile Bootstrap UTL with 95% Coverage	6.089	95% BCA Bootstrap UTL with 95% Coverage	6.103
95% UPL	5.212	90% Percentile	2.382
90% Chebyshev UPL	44.25	95% Percentile	4.666
95% Chebyshev UPL	63	99% Percentile	31.81
95% USL	155.2		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Ra228 SB

General Statistics

Total Number of Observations	178	Number of Distinct Observations	165
Minimum	0.224	First Quartile	0.663
Second Largest	1.515	Median	0.872
Maximum	1.537	Third Quartile	1.068
Mean	0.867	SD	0.268
Coefficient of Variation	0.309	Skewness	0.0877
Mean of logged Data	-0.197	SD of logged Data	0.346

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	1.848	d2max (for USL)	3.397

Normal GOF Test

Shapiro Wilk Test Statistic	0.979	**Normal GOF Test**	
5% Shapiro Wilk P Value	0.298	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.0506	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0668	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	1.362	90% Percentile (z)	1.21
95% UPL (t)	1.311	95% Percentile (z)	1.307
95% USL	1.777	99% Percentile (z)	1.49

Gamma GOF Test

A-D Test Statistic	0.719	**Anderson-Darling Gamma GOF Test**

5% A-D Critical Value	0.752	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.0606	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.0693	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	9.403	k star (bias corrected MLE)	9.248
Theta hat (MLE)	0.0922	Theta star (bias corrected MLE)	0.0937
nu hat (MLE)	3348	nu star (bias corrected)	3292
MLE Mean (bias corrected)	0.867	MLE Sd (bias corrected)	0.285

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	1.385	90% Percentile	1.246
95% Hawkins Wixley (HW) Approx. Gamma UPL	1.399	95% Percentile	1.382
95% WH Approx. Gamma UTL with 95% Coverage	1.459	99% Percentile	1.663
95% HW Approx. Gamma UTL with 95% Coverage	1.479		
95% WH USL	2.172	95% HW USL	2.262

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.948	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk P Value	2.9063E-6	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0828	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.0668	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	1.556	90% Percentile (z)	1.279
95% UPL (t)	1.457	95% Percentile (z)	1.45
95% USL	2.658	99% Percentile (z)	1.836

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	173	95% UTL with 95% Coverage	1.375
Approx, f used to compute achieved CC	1.518	Approximate Actual Confidence Coefficient achieved by UTL	0.884
		Approximate Sample Size needed to achieve specified CC	208
95% Percentile Bootstrap UTL with 95% Coverage	1.376	95% BCA Bootstrap UTL with 95% Coverage	1.375
95% UPL	1.334	90% Percentile	1.215
90% Chebyshev UPL	1.673	95% Percentile	1.3
95% Chebyshev UPL	2.038	99% Percentile	1.468
95% USL	1.537		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data

represents a background data set and when many onsite observations need to be compared with the BTV.

Th228 SB

General Statistics

Total Number of Observations	177	Number of Distinct Observations	160
Minimum	0.049	First Quartile	0.696
Second Largest	1.31	Median	0.805
Maximum	1.37	Third Quartile	0.928
Mean	0.812	SD	0.19
Coefficient of Variation	0.233	Skewness	-0.172
Mean of logged Data	-0.245	SD of logged Data	0.32

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	1.849	d2max (for USL)	3.395

Normal GOF Test

Shapiro Wilk Test Statistic	0.98	**Normal GOF Test**	
5% Shapiro Wilk P Value	0.369	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.0525	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.067	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	1.163	90% Percentile (z)	1.055
	95% UPL (t)	1.127	95% Percentile (z)	1.124
	95% USL	1.456	99% Percentile (z)	1.253

Gamma GOF Test

A-D Test Statistic	2.931	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.751	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.0944	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.0695	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	13.55	k star (bias corrected MLE)	13.32
Theta hat (MLE)	0.06	Theta star (bias corrected MLE)	0.061
nu hat (MLE)	4795	nu star (bias corrected)	4715
MLE Mean (bias corrected)	0.812	MLE Sd (bias corrected)	0.223

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL		1.206	90% Percentile	1.107
95% Hawkins Wixley (HW) Approx. Gamma UPL		1.227	95% Percentile	1.21
95% WH Approx. Gamma UTL with	95% Coverage	1.261	99% Percentile	1.417
95% HW Approx. Gamma UTL with	95% Coverage	1.287		
	95% WH USL	1.768	95% HW USL	1.855

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.754	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.133	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.067	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with	95% Coverage	1.414	90% Percentile (z)	1.18
	95% UPL (t)	1.331	95% Percentile (z)	1.325
	95% USL	2.321	99% Percentile (z)	1.648

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	172	95% UTL with 95% Coverage	1.215
Approx, f used to compute achieved CC	1.509	Approximate Actual Confidence Coefficient achieved by UTL	0.881
		Approximate Sample Size needed to achieve specified CC	208
95% Percentile Bootstrap UTL with 95% Coverage	1.215	95% BCA Bootstrap UTL with 95% Coverage	1.216
95% UPL	1.126	90% Percentile	1.042
90% Chebyshev UPL	1.383	95% Percentile	1.114
95% Chebyshev UPL	1.641	99% Percentile	1.289
95% USL	1.37		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Th230 SB

General Statistics

Total Number of Observations	177	Number of Distinct Observations	161
Minimum	0.097	First Quartile	0.766
Second Largest	13.85	Median	0.913
Maximum	228.7	Third Quartile	1.088
Mean	2.341	SD	17.14
Coefficient of Variation	7.323	Skewness	13.23
Mean of logged Data	-0.0491	SD of logged Data	0.613

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	1.849	d2max (for USL)	3.395

Normal GOF Test

Shapiro Wilk Test Statistic	0.0925	**Normal GOF Test**
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.477	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.067	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	34.03	90% Percentile (z)	24.31
	95% UPL (t)	30.77	95% Percentile (z)	30.54
	95% USL	60.54	99% Percentile (z)	42.22

Gamma GOF Test

A-D Test Statistic	5.650E+28	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.803	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.393	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.0727	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.675	k star (bias corrected MLE)	0.668
Theta hat (MLE)	3.467	Theta star (bias corrected MLE)	3.507
nu hat (MLE)	239	nu star (bias corrected)	236.3
MLE Mean (bias corrected)	2.341	MLE Sd (bias corrected)	2.865

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL		5.006	90% Percentile	5.941
95% Hawkins Wixley (HW) Approx. Gamma UPL		4.015	95% Percentile	8.105
95% WH Approx. Gamma UTL with	95% Coverage	5.741	99% Percentile	13.29
95% HW Approx. Gamma UTL with	95% Coverage	4.581		
	95% WH USL	14.53	95% HW USL	11.65

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.706	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.194	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.067	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with	95% Coverage	2.956	90% Percentile (z)	2.088
	95% UPL (t)	2.63	95% Percentile (z)	2.609
	95% USL	7.625	99% Percentile (z)	3.961

Nonparametric Distribution Free Background Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	172	95% UTL with 95% Coverage	2.102
Approx, f used to compute achieved CC	1.509	Approximate Actual Confidence Coefficient achieved by UTL	0.881
		Approximate Sample Size needed to achieve specified CC	208
95% Percentile Bootstrap UTL with 95% Coverage	2.251	95% BCA Bootstrap UTL with 95% Coverage	2.251
95% UPL	1.937	90% Percentile	1.415
90% Chebyshev UPL	53.91	95% Percentile	1.907
95% Chebyshev UPL	77.27	99% Percentile	5.552
95% USL	228.7		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Th232 SB

General Statistics

Total Number of Observations	177	Number of Distinct Observations	153
Minimum	-0.059	First Quartile	0.677
Second Largest	1.285	Median	0.775
Maximum	1.347	Third Quartile	0.924
Mean	0.784	SD	0.218
Coefficient of Variation	0.278	Skewness	-0.662

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	1.849	d2max (for USL)	3.395

Normal GOF Test

Shapiro Wilk Test Statistic	0.952	**Normal GOF Test**	
5% Shapiro Wilk P Value	2.0106E-5	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.0843	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.067	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	1.187	90% Percentile (z)	1.063
95% UPL (t)	1.145	95% Percentile (z)	1.142
95% USL	1.524	99% Percentile (z)	1.291

Gamma Statistics

Gamma Statistics Not Available

Dataset Contains Values <= 0 - Cannot Compute Gamma Statistics

Dataset Contains Values <= 0 - Cannot Compute Log Statistics

Nonparametric Distribution Free Background Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	172	95% UTL with 95% Coverage	1.222
Approx, f used to compute achieved CC	1.509	Approximate Actual Confidence Coefficient achieved by UTL	0.881
		Approximate Sample Size needed to achieve specified CC	208
95% Percentile Bootstrap UTL with 95% Coverage	1.222	95% BCA Bootstrap UTL with 95% Coverage	1.222
95% UPL	1.131	90% Percentile	1.038
90% Chebyshev UPL	1.44	95% Percentile	1.126
95% Chebyshev UPL	1.737	99% Percentile	1.258
95% USL	1.347		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

U234 SB

General Statistics

Total Number of Observations	178	Number of Distinct Observations	170
Minimum	0.348	First Quartile	0.716
Second Largest	6.184	Median	0.94
Maximum	8.252	Third Quartile	1.315
Mean	1.131	SD	0.825
Coefficient of Variation	0.73	Skewness	5.308
Mean of logged Data	-0.0103	SD of logged Data	0.473

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	1.848	d2max (for USL)	3.397

Normal GOF Test

Shapiro Wilk Test Statistic	0.594	**Normal GOF Test**	
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.193	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0668	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	2.656	90% Percentile (z)	2.188
95% UPL (t)	2.499	95% Percentile (z)	2.488
95% USL	3.934	99% Percentile (z)	3.051

Gamma GOF Test

A-D Test Statistic	3.171	**Anderson-Darling Gamma GOF Test**

5% A-D Critical Value	0.757	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.0919	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.0696	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	3.909	k star (bias corrected MLE)	3.847
Theta hat (MLE)	0.289	Theta star (bias corrected MLE)	0.294
nu hat (MLE)	1392	nu star (bias corrected)	1370
MLE Mean (bias corrected)	1.131	MLE Sd (bias corrected)	0.577

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	2.19	90% Percentile	1.904
95% Hawkins Wixley (HW) Approx. Gamma UPL	2.176	95% Percentile	2.215
95% WH Approx. Gamma UTL with 95% Coverage	2.362	99% Percentile	2.881
95% HW Approx. Gamma UTL with 95% Coverage	2.354		
95% WH USL	4.109	95% HW USL	4.236

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.956	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk P Value	1.4813E-4	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0553	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.0668	Data appear Lognormal at 5% Significance Level	

Data appear Approximate Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	2.371	90% Percentile (z)	1.814
95% UPL (t)	2.168	95% Percentile (z)	2.154
95% USL	4.931	99% Percentile (z)	2.973

Nonparametric Distribution Free Background Statistics

Data appear Approximate Lognormal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	173	95% UTL with 95% Coverage	2.168
Approx, f used to compute achieved CC	1.518	Approximate Actual Confidence Coefficient achieved by UTL	0.884
		Approximate Sample Size needed to achieve specified CC	208
95% Percentile Bootstrap UTL with 95% Coverage	2.248	95% BCA Bootstrap UTL with 95% Coverage	2.248
95% UPL	2.083	90% Percentile	1.644
90% Chebyshev UPL	3.613	95% Percentile	2.078
95% Chebyshev UPL	4.738	99% Percentile	4.26
95% USL	8.252		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data

represents a background data set and when many onsite observations need to be compared with the BTV.

U235 SB

General Statistics

Total Number of Observations	178	Number of Distinct Observations	78
Minimum	-0.107	First Quartile	0.0203
Second Largest	0.211	Median	0.034
Maximum	0.292	Third Quartile	0.0538
Mean	0.0397	SD	0.0362
Coefficient of Variation	0.912	Skewness	2.132

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	1.848	d2max (for USL)	3.397

Normal GOF Test

Shapiro Wilk Test Statistic	0.841	**Normal GOF Test**	
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.134	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0668	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	0.107	90% Percentile (z)		0.0861
	95% UPL (t)	0.0997	95% Percentile (z)		0.0993
	95% USL	0.163	99% Percentile (z)		0.124

Gamma Statistics

Gamma Statistics Not Available

Dataset Contains Values <= 0 - Cannot Compute Gamma Statistics

Dataset Contains Values <= 0 - Cannot Compute Log Statistics

Nonparametric Distribution Free Background Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r		173	95% UTL with	95% Coverage	0.095
Approx, f used to compute achieved CC		1.518	Approximate Actual Confidence Coefficient achieved by UTL		0.884
			Approximate Sample Size needed to achieve specified CC		208
95% Percentile Bootstrap UTL with	95% Coverage	0.0956	95% BCA Bootstrap UTL with	95% Coverage	0.095
	95% UPL	0.086		90% Percentile	0.076
	90% Chebyshev UPL	0.149		95% Percentile	0.086
	95% Chebyshev UPL	0.198		99% Percentile	0.133
	95% USL	0.292			

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

U238 SB

General Statistics

Total Number of Observations	178	Number of Distinct Observations	162
Minimum	0.312	First Quartile	0.716
Second Largest	6.129	Median	0.956
Maximum	8.023	Third Quartile	1.284
Mean	1.116	SD	0.788
Coefficient of Variation	0.706	Skewness	5.5
Mean of logged Data	-0.0156	SD of logged Data	0.46

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	1.848	d2max (for USL)	3.397

Normal GOF Test

Shapiro Wilk Test Statistic	0.593	**Normal GOF Test**
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.205	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0668	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	2.572	90% Percentile (z)	2.126
	95% UPL (t)	2.422	95% Percentile (z)	2.412
	95% USL	3.792	99% Percentile (z)	2.949

Gamma GOF Test

A-D Test Statistic	3.197	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.756	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.106	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.0696	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	4.154	k star (bias corrected MLE)	4.087
Theta hat (MLE)	0.269	Theta star (bias corrected MLE)	0.273
nu hat (MLE)	1479	nu star (bias corrected)	1455
MLE Mean (bias corrected)	1.116	MLE Sd (bias corrected)	0.552

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	2.128	90% Percentile	1.856

95% Hawkins Wixley (HW) Approx. Gamma UPL	2.115	95% Percentile	2.151
95% WH Approx. Gamma UTL with 95% Coverage	2.29	99% Percentile	2.78
95% HW Approx. Gamma UTL with 95% Coverage	2.283		
95% WH USL	3.936	95% HW USL	4.053

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.962	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk P Value	0.00181	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.0687	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.0668	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	2.305	90% Percentile (z)	1.776
95% UPL (t)	2.112	95% Percentile (z)	2.099
95% USL	4.7	99% Percentile (z)	2.872

Nonparametric Distribution Free Background Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	173	95% UTL with 95% Coverage	2.133
Approx, f used to compute achieved CC	1.518	Approximate Actual Confidence Coefficient achieved by UTL	0.884
		Approximate Sample Size needed to achieve specified CC	208
95% Percentile Bootstrap UTL with 95% Coverage	2.179	95% BCA Bootstrap UTL with 95% Coverage	2.179
95% UPL	1.992	90% Percentile	1.679
90% Chebyshev UPL	3.486	95% Percentile	1.974
95% Chebyshev UPL	4.56	99% Percentile	3.915
95% USL	8.023		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Ra226 BSS

General Statistics

Total Number of Observations	15	Number of Distinct Observations	14
Minimum	0.394	First Quartile	0.685
Second Largest	0.883	Median	0.777
Maximum	0.921	Third Quartile	0.831
Mean	0.744	SD	0.142
Coefficient of Variation	0.19	Skewness	-1.276
Mean of logged Data	-0.316	SD of logged Data	0.224

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.566	d2max (for USL)	2.409

Normal GOF Test

Shapiro Wilk Test Statistic	0.897	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.881	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.174	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.22	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	1.108	90% Percentile (z)	0.926
	95% UPL (t)	1.002	95% Percentile (z)	0.978
	95% USL	1.086	99% Percentile (z)	1.074

Gamma GOF Test

A-D Test Statistic	0.837	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.735	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.2	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.221	Detected data appear Gamma Distributed at 5% Significance Level

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics

k hat (MLE)	24.11	k star (bias corrected MLE)	19.33
Theta hat (MLE)	0.0309	Theta star (bias corrected MLE)	0.0385
nu hat (MLE)	723.3	nu star (bias corrected)	580
MLE Mean (bias corrected)	0.744	MLE Sd (bias corrected)	0.169

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL		1.055	90% Percentile	0.968
95% Hawkins Wixley (HW) Approx. Gamma UPL		1.064	95% Percentile	1.043
95% WH Approx. Gamma UTL with	95% Coverage	1.21	99% Percentile	1.194
95% HW Approx. Gamma UTL with	95% Coverage	1.228		
	95% WH USL	1.176	95% HW USL	1.192

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.821	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.881	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.21	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.22	Data appear Lognormal at 5% Significance Level

Data appear Approximate Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with	95% Coverage	1.295	90% Percentile (z)	0.971
	95% UPL (t)	1.096	95% Percentile (z)	1.054
	95% USL	1.25	99% Percentile (z)	1.227

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	15	95% UTL with 95% Coverage	0.921
Approx, f used to compute achieved CC	0.789	Approximate Actual Confidence Coefficient achieved by UTL	0.537
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	0.921	95% BCA Bootstrap UTL with 95% Coverage	0.921
95% UPL	0.921	90% Percentile	0.877
90% Chebyshev UPL	1.183	95% Percentile	0.894
95% Chebyshev UPL	1.382	99% Percentile	0.916
95% USL	0.921		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Ra228 BSS

General Statistics

Total Number of Observations	15	Number of Distinct Observations	15
Minimum	0.365	First Quartile	0.813
Second Largest	1.23	Median	0.956
Maximum	1.26	Third Quartile	1.045
Mean	0.903	SD	0.239
Coefficient of Variation	0.265	Skewness	-0.774
Mean of logged Data	-0.144	SD of logged Data	0.323

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.566	d2max (for USL)	2.409

Normal GOF Test

Shapiro Wilk Test Statistic	0.943	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.881	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.164	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.22	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	1.516	90% Percentile (z)	1.209
95% UPL (t)	1.338	95% Percentile (z)	1.296
95% USL	1.479	99% Percentile (z)	1.459

Gamma GOF Test

A-D Test Statistic	0.67	**Anderson-Darling Gamma GOF Test**	

5% A-D Critical Value	0.737	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.207	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.221	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	12.03	k star (bias corrected MLE)	9.664
Theta hat (MLE)	0.0751	Theta star (bias corrected MLE)	0.0934
nu hat (MLE)	360.8	nu star (bias corrected)	289.9
MLE Mean (bias corrected)	0.903	MLE Sd (bias corrected)	0.29

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	1.453	90% Percentile	1.289
95% Hawkins Wixley (HW) Approx. Gamma UPL	1.475	95% Percentile	1.428
95% WH Approx. Gamma UTL with 95% Coverage	1.747	99% Percentile	1.712
95% HW Approx. Gamma UTL with 95% Coverage	1.794		
95% WH USL	1.682	95% HW USL	1.723

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.848	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.881	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.227	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.22	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	1.985	90% Percentile (z)	1.31
95% UPL (t)	1.559	95% Percentile (z)	1.474
95% USL	1.887	99% Percentile (z)	1.837

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	15	95% UTL with 95% Coverage	1.26
Approx, f used to compute achieved CC	0.789	Approximate Actual Confidence Coefficient achieved by UTL	0.537
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	1.26	95% BCA Bootstrap UTL with 95% Coverage	1.26
95% UPL	1.26	90% Percentile	1.166
90% Chebyshev UPL	1.644	95% Percentile	1.239
95% Chebyshev UPL	1.979	99% Percentile	1.256
95% USL	1.26		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data

represents a background data set and when many onsite observations need to be compared with the BTV.

Th228 BSS

General Statistics

Total Number of Observations	15	Number of Distinct Observations	14
Minimum	0.595	First Quartile	0.947
Second Largest	1.45	Median	1.05
Maximum	1.64	Third Quartile	1.155
Mean	1.085	SD	0.258
Coefficient of Variation	0.238	Skewness	0.48
Mean of logged Data	0.0549	SD of logged Data	0.243

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.566	d2max (for USL)	2.409

Normal GOF Test

Shapiro Wilk Test Statistic	0.953	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.881	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.172	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.22	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	1.748	90% Percentile (z)	1.417
	95% UPL (t)	1.555	95% Percentile (z)	1.51
	95% USL	1.708	99% Percentile (z)	1.687

Gamma GOF Test

A-D Test Statistic	0.35	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.735	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.142	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.221	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	18.72	k star (bias corrected MLE)	15.02
Theta hat (MLE)	0.058	Theta star (bias corrected MLE)	0.0722
nu hat (MLE)	561.7	nu star (bias corrected)	450.7
MLE Mean (bias corrected)	1.085	MLE Sd (bias corrected)	0.28

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL		1.604	90% Percentile	1.456
95% Hawkins Wixley (HW) Approx. Gamma UPL		1.613	95% Percentile	1.583
95% WH Approx. Gamma UTL with	95% Coverage	1.869	99% Percentile	1.84
95% HW Approx. Gamma UTL with	95% Coverage	1.891		
	95% WH USL	1.811	95% HW USL	1.83

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.953	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.881	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.144	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.22	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with	95% Coverage	1.973	90% Percentile (z)	1.443
	95% UPL (t)	1.645	95% Percentile (z)	1.577
	95% USL	1.899	99% Percentile (z)	1.861

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	15	95% UTL with 95% Coverage	1.64
Approx, f used to compute achieved CC	0.789	Approximate Actual Confidence Coefficient achieved by UTL	0.537
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	1.64	95% BCA Bootstrap UTL with 95% Coverage	1.64
95% UPL	1.64	90% Percentile	1.422
90% Chebyshev UPL	1.886	95% Percentile	1.507
95% Chebyshev UPL	2.249	99% Percentile	1.613
95% USL	1.64		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Th230 BSS

General Statistics

Total Number of Observations	15	Number of Distinct Observations	15
Minimum	0.444	First Quartile	0.801
Second Largest	1.15	Median	0.867
Maximum	1.62	Third Quartile	1.035
Mean	0.927	SD	0.264
Coefficient of Variation	0.285	Skewness	0.93
Mean of logged Data	-0.113	SD of logged Data	0.289

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.566	d2max (for USL)	2.409

Normal GOF Test

Shapiro Wilk Test Statistic	0.923	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.881	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.147	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.22	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	1.604	90% Percentile (z)	1.265
	95% UPL (t)	1.407	95% Percentile (z)	1.361
	95% USL	1.563	99% Percentile (z)	1.541

Gamma GOF Test

A-D Test Statistic	0.384	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.158	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.221	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	13.42	k star (bias corrected MLE)	10.78
Theta hat (MLE)	0.0691	Theta star (bias corrected MLE)	0.086
nu hat (MLE)	402.5	nu star (bias corrected)	323.3
MLE Mean (bias corrected)	0.927	MLE Sd (bias corrected)	0.282

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL		1.458	90% Percentile	1.303
95% Hawkins Wixley (HW) Approx. Gamma UPL		1.469	95% Percentile	1.435
95% WH Approx. Gamma UTL with	95% Coverage	1.739	99% Percentile	1.707
95% HW Approx. Gamma UTL with	95% Coverage	1.767		
	95% WH USL	1.677	95% HW USL	1.701

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.943	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.881	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.177	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.22	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with	95% Coverage	1.874	90% Percentile (z)	1.293
	95% UPL (t)	1.51	95% Percentile (z)	1.436
	95% USL	1.791	99% Percentile (z)	1.749

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	15	95% UTL with 95% Coverage	1.62
Approx, f used to compute achieved CC	0.789	Approximate Actual Confidence Coefficient achieved by UTL	0.537
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	1.62	95% BCA Bootstrap UTL with 95% Coverage	1.62
95% UPL	1.62	90% Percentile	1.13
90% Chebyshev UPL	1.745	95% Percentile	1.291
95% Chebyshev UPL	2.115	99% Percentile	1.554
95% USL	1.62		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Th232 BSS

General Statistics

Total Number of Observations	15	Number of Distinct Observations	15
Minimum	0.473	First Quartile	0.718
Second Largest	1.15	Median	0.95
Maximum	1.24	Third Quartile	1.04
Mean	0.879	SD	0.228
Coefficient of Variation	0.259	Skewness	-0.343
Mean of logged Data	-0.164	SD of logged Data	0.285

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.566	d2max (for USL)	2.409

Normal GOF Test

Shapiro Wilk Test Statistic	0.961	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.881	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.156	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.22	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	1.463	90% Percentile (z)	1.171
95% UPL (t)	1.293	95% Percentile (z)	1.254
95% USL	1.428	99% Percentile (z)	1.409

Gamma GOF Test

A-D Test Statistic	0.419	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.736	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.183	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.221	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	14.27	k star (bias corrected MLE)	11.46
Theta hat (MLE)	0.0616	Theta star (bias corrected MLE)	0.0767
nu hat (MLE)	428.2	nu star (bias corrected)	343.9
MLE Mean (bias corrected)	0.879	MLE Sd (bias corrected)	0.26

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	1.367	90% Percentile	1.224
95% Hawkins Wixley (HW) Approx. Gamma UPL	1.38	95% Percentile	1.345
95% WH Approx. Gamma UTL with 95% Coverage	1.623	99% Percentile	1.593
95% HW Approx. Gamma UTL with 95% Coverage	1.653		
95% WH USL	1.567	95% HW USL	1.592

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.928	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.881	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.187	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.22	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	1.763	90% Percentile (z)	1.223
95% UPL (t)	1.425	95% Percentile (z)	1.356
95% USL	1.686	99% Percentile (z)	1.647

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	15	95% UTL with 95% Coverage	1.24
Approx, f used to compute achieved CC	0.789	Approximate Actual Confidence Coefficient achieved by UTL	0.537
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	1.24	95% BCA Bootstrap UTL with 95% Coverage	1.24
95% UPL	1.24	90% Percentile	1.118
90% Chebyshev UPL	1.585	95% Percentile	1.177
95% Chebyshev UPL	1.904	99% Percentile	1.227
95% USL	1.24		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.

The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

U234 BSS

General Statistics

Total Number of Observations	15	Number of Distinct Observations	15
Minimum	0.281	First Quartile	0.741
Second Largest	1.47	Median	0.856
Maximum	1.68	Third Quartile	1.025
Mean	0.913	SD	0.342
Coefficient of Variation	0.375	Skewness	0.655
Mean of logged Data	-0.164	SD of logged Data	0.416

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.566	d2max (for USL)	2.409

Normal GOF Test

Shapiro Wilk Test Statistic	0.942	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.881	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.155	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.22	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	1.79	90% Percentile (z)	1.351
	95% UPL (t)	1.534	95% Percentile (z)	1.475
	95% USL	1.736	99% Percentile (z)	1.708

Gamma GOF Test

A-D Test Statistic	0.395	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.738	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.177	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.222	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	7.055	k star (bias corrected MLE)	5.689
Theta hat (MLE)	0.129	Theta star (bias corrected MLE)	0.16
nu hat (MLE)	211.7	nu star (bias corrected)	170.7
MLE Mean (bias corrected)	0.913	MLE Sd (bias corrected)	0.383

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL		1.658	90% Percentile	1.424
95% Hawkins Wixley (HW) Approx. Gamma UPL		1.687	95% Percentile	1.619
95% WH Approx. Gamma UTL with	95% Coverage	2.085	99% Percentile	2.029
95% HW Approx. Gamma UTL with	95% Coverage	2.156		
	95% WH USL	1.99	95% HW USL	2.05

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.913	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.881	Data appear Lognormal at 5% Significance Level

Lilliefors Test Statistic	0.207	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.22	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with	95% Coverage	2.471	90% Percentile (z)	1.447
	95% UPL (t)	1.81	95% Percentile (z)	1.684
	95% USL	2.314	99% Percentile (z)	2.236

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

	Order of Statistic, r	15	95% UTL with	95% Coverage	1.68
	Approx, f used to compute achieved CC	0.789	Approximate Actual Confidence Coefficient achieved by UTL		0.537
			Approximate Sample Size needed to achieve specified CC		59
95% Percentile Bootstrap UTL with	95% Coverage	1.68	95% BCA Bootstrap UTL with	95% Coverage	1.68
	95% UPL	1.68		90% Percentile	1.33
	90% Chebyshev UPL	1.972		95% Percentile	1.533
	95% Chebyshev UPL	2.451		99% Percentile	1.651
	95% USL	1.68			

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

U235 BSS

General Statistics

Total Number of Observations	15	Number of Distinct Observations	15
Minimum	0	First Quartile	0.0287
Second Largest	0.0847	Median	0.0422
Maximum	0.102	Third Quartile	0.0625
Mean	0.0465	SD	0.0271
Coefficient of Variation	0.583	Skewness	0.427

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.566	d2max (for USL)	2.409

Normal GOF Test

Shapiro Wilk Test Statistic	0.977	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.881	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.12	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.22	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	0.116	90% Percentile (z)		0.0812
	95% UPL (t)	0.0958	95% Percentile (z)		0.0911
	95% USL	0.112	99% Percentile (z)		0.11

Gamma Statistics

Gamma Statistics Not Available

Cannot Compute Gamma Statistics!

Cannot Compute Log Statistics

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r		15	95% UTL with	95% Coverage	0.102
Approx, f used to compute achieved CC		0.789	Approximate Actual Confidence Coefficient achieved by UTL		0.537
			Approximate Sample Size needed to achieve specified CC		59
95% Percentile Bootstrap UTL with	95% Coverage	0.102	95% BCA Bootstrap UTL with	95% Coverage	0.102
	95% UPL	0.102		90% Percentile	0.0799
	90% Chebyshev UPL	0.13		95% Percentile	0.0899
	95% Chebyshev UPL	0.168		99% Percentile	0.0996
	95% USL	0.102			

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

U238 BSS

General Statistics

Total Number of Observations	15	Number of Distinct Observations	15
Minimum	0.367	First Quartile	0.716
Second Largest	1.3	Median	0.822
Maximum	1.36	Third Quartile	1.011
Mean	0.86	SD	0.294
Coefficient of Variation	0.342	Skewness	0.15
Mean of logged Data	-0.211	SD of logged Data	0.375

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.566	d2max (for USL)	2.409

Normal GOF Test

Shapiro Wilk Test Statistic	0.96	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.881	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.14	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.22	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	1.615	90% Percentile (z)	1.237
	95% UPL (t)	1.396	95% Percentile (z)	1.344
	95% USL	1.569	99% Percentile (z)	1.545

Gamma GOF Test

A-D Test Statistic	0.297	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.738	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.141	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.222	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	8.368	k star (bias corrected MLE)	6.739
Theta hat (MLE)	0.103	Theta star (bias corrected MLE)	0.128
nu hat (MLE)	251	nu star (bias corrected)	202.2
MLE Mean (bias corrected)	0.86	MLE Sd (bias corrected)	0.331

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	1.501	90% Percentile	1.303
95% Hawkins Wixley (HW) Approx. Gamma UPL	1.522	95% Percentile	1.468
95% WH Approx. Gamma UTL with 95% Coverage	1.86	99% Percentile	1.812
95% HW Approx. Gamma UTL with 95% Coverage	1.91		
95% WH USL	1.78	95% HW USL	1.823

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.943	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.881	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.167	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.22	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with	95% Coverage	2.118	90% Percentile (z)	1.309
	95% UPL (t)	1.601	95% Percentile (z)	1.5
	95% USL	1.997	99% Percentile (z)	1.936

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	15	95% UTL with 95% Coverage	1.36
Approx, f used to compute achieved CC	0.789	Approximate Actual Confidence Coefficient achieved by UTL	0.537
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	1.36	95% BCA Bootstrap UTL with 95% Coverage	1.36
95% UPL	1.36	90% Percentile	1.28
90% Chebyshev UPL	1.772	95% Percentile	1.318
95% Chebyshev UPL	2.185	99% Percentile	1.352
95% USL	1.36		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Ra226 BSB

General Statistics

Total Number of Observations	15	Number of Distinct Observations	15
Minimum	0.618	First Quartile	0.728
Second Largest	1.2	Median	0.838
Maximum	1.3	Third Quartile	0.955
Mean	0.867	SD	0.196
Coefficient of Variation	0.226	Skewness	0.885
Mean of logged Data	-0.165	SD of logged Data	0.217

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.566	d2max (for USL)	2.409

Normal GOF Test

Shapiro Wilk Test Statistic	0.933	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.881	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.125	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.22	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	1.371	90% Percentile (z)	1.119
95% UPL (t)	1.224	95% Percentile (z)	1.19
95% USL	1.34	99% Percentile (z)	1.324

Gamma GOF Test

A-D Test Statistic	0.227	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.735	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.0983	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.221	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	22.35	k star (bias corrected MLE)	17.92
Theta hat (MLE)	0.0388	Theta star (bias corrected MLE)	0.0484
nu hat (MLE)	670.4	nu star (bias corrected)	537.7
MLE Mean (bias corrected)	0.867	MLE Sd (bias corrected)	0.205

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	1.244	90% Percentile	1.138
95% Hawkins Wixley (HW) Approx. Gamma UPL	1.247	95% Percentile	1.229
95% WH Approx. Gamma UTL with 95% Coverage	1.433	99% Percentile	1.413
95% HW Approx. Gamma UTL with 95% Coverage	1.443		
95% WH USL	1.392	95% HW USL	1.4

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.968	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.881	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0845	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.22	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	1.48	90% Percentile (z)	1.12
95% UPL (t)	1.258	95% Percentile (z)	1.212
95% USL	1.43	99% Percentile (z)	1.405

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	15	95% UTL with 95% Coverage	1.3
Approx, f used to compute achieved CC	0.789	Approximate Actual Confidence Coefficient achieved by UTL	0.537
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	1.3	95% BCA Bootstrap UTL with 95% Coverage	1.3
95% UPL	1.3	90% Percentile	1.128
90% Chebyshev UPL	1.476	95% Percentile	1.23
95% Chebyshev UPL	1.751	99% Percentile	1.286
95% USL	1.3		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.

The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Ra228 BSB

General Statistics

Total Number of Observations	15	Number of Distinct Observations	14
Minimum	0.691	First Quartile	0.852
Second Largest	1.23	Median	0.973
Maximum	1.24	Third Quartile	1.045
Mean	0.967	SD	0.172
Coefficient of Variation	0.178	Skewness	0.109
Mean of logged Data	-0.0488	SD of logged Data	0.18

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.566	d2max (for USL)	2.409

Normal GOF Test

Shapiro Wilk Test Statistic	0.957	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.881	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.114	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.22	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	1.407	90% Percentile (z)	1.187
	95% UPL (t)	1.279	95% Percentile (z)	1.249
	95% USL	1.38	99% Percentile (z)	1.366

Gamma GOF Test

A-D Test Statistic	0.24	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.735	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.112	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.221	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	33.48	k star (bias corrected MLE)	26.83
Theta hat (MLE)	0.0289	Theta star (bias corrected MLE)	0.036
nu hat (MLE)	1004	nu star (bias corrected)	804.9
MLE Mean (bias corrected)	0.967	MLE Sd (bias corrected)	0.187

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL		1.305	90% Percentile	1.212
95% Hawkins Wixley (HW) Approx. Gamma UPL		1.309	95% Percentile	1.293
95% WH Approx. Gamma UTL with	95% Coverage	1.469	99% Percentile	1.453
95% HW Approx. Gamma UTL with	95% Coverage	1.479		
	95% WH USL	1.434	95% HW USL	1.442

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.959	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.881	Data appear Lognormal at 5% Significance Level

Lilliefors Test Statistic	0.122	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.22	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with	95% Coverage	1.513	90% Percentile (z)	1.2
	95% UPL (t)	1.322	95% Percentile (z)	1.281
	95% USL	1.471	99% Percentile (z)	1.449

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	15		95% UTL with	95% Coverage	1.24
Approx, f used to compute achieved CC	0.789		Approximate Actual Confidence Coefficient achieved by UTL		0.537
			Approximate Sample Size needed to achieve specified CC		59
95% Percentile Bootstrap UTL with	95% Coverage	1.24	95% BCA Bootstrap UTL with	95% Coverage	1.24
	95% UPL	1.24		90% Percentile	1.214
	90% Chebyshev UPL	1.499		95% Percentile	1.233
	95% Chebyshev UPL	1.74		99% Percentile	1.239
	95% USL	1.24			

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Th228 BSB

General Statistics

Total Number of Observations	15	Number of Distinct Observations	15
Minimum	0.722	First Quartile	0.912
Second Largest	1.54	Median	1.13
Maximum	1.55	Third Quartile	1.31
Mean	1.131	SD	0.274
Coefficient of Variation	0.242	Skewness	0.0147
Mean of logged Data	0.0946	SD of logged Data	0.252

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.566	d2max (for USL)	2.409

Normal GOF Test

Shapiro Wilk Test Statistic	0.946	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.881	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.136	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.22	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	1.834	90% Percentile (z)		1.482
	95% UPL (t)	1.629	95% Percentile (z)		1.581
	95% USL	1.791	99% Percentile (z)		1.768

Gamma GOF Test

A-D Test Statistic	0.329	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.735	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.148	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.221	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	17.57	k star (bias corrected MLE)	14.1
Theta hat (MLE)	0.0644	Theta star (bias corrected MLE)	0.0802
nu hat (MLE)	527	nu star (bias corrected)	422.9
MLE Mean (bias corrected)	1.131	MLE Sd (bias corrected)	0.301

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL		1.692	90% Percentile		1.53
95% Hawkins Wixley (HW) Approx. Gamma UPL		1.702	95% Percentile		1.668
95% WH Approx. Gamma UTL with	95% Coverage	1.98	99% Percentile		1.947
95% HW Approx. Gamma UTL with	95% Coverage	2.005			
	95% WH USL	1.917	95% HW USL		1.938

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.936	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.881	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.141	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.22	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with	95% Coverage	2.097	90% Percentile (z)		1.518
	95% UPL (t)	1.738	95% Percentile (z)		1.663
	95% USL	2.016	99% Percentile (z)		1.974

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r		15	95% UTL with	95% Coverage	1.55
Approx, f used to compute achieved CC		0.789	Approximate Actual Confidence Coefficient achieved by UTL		0.537
			Approximate Sample Size needed to achieve specified CC		59
95% Percentile Bootstrap UTL with	95% Coverage	1.55	95% BCA Bootstrap UTL with	95% Coverage	1.55

95% UPL	1.55	90% Percentile	1.5
90% Chebyshev UPL	1.979	95% Percentile	1.543
95% Chebyshev UPL	2.363	99% Percentile	1.549
95% USL	1.55		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Th230 BSB

General Statistics

Total Number of Observations	15	Number of Distinct Observations	15
Minimum	0.6	First Quartile	0.678
Second Largest	1.05	Median	0.864
Maximum	1.17	Third Quartile	0.993
Mean	0.849	SD	0.181
Coefficient of Variation	0.214	Skewness	0.12
Mean of logged Data	-0.185	SD of logged Data	0.217

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.566	d2max (for USL)	2.409

Normal GOF Test

Shapiro Wilk Test Statistic	0.938	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.881	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.146	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.22	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	1.314	90% Percentile (z)	1.081
	95% UPL (t)	1.179	95% Percentile (z)	1.147
	95% USL	1.286	99% Percentile (z)	1.271

Gamma GOF Test

A-D Test Statistic	0.432	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.735	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.145	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.221	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	23.15	k star (bias corrected MLE)	18.57
Theta hat (MLE)	0.0367	Theta star (bias corrected MLE)	0.0457

nu hat (MLE)	694.6	nu star (bias corrected)	557
MLE Mean (bias corrected)	0.849	MLE Sd (bias corrected)	0.197

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	1.211	90% Percentile	1.109
95% Hawkins Wixley (HW) Approx. Gamma UPL	1.216	95% Percentile	1.197
95% WH Approx. Gamma UTL with 95% Coverage	1.393	99% Percentile	1.373
95% HW Approx. Gamma UTL with 95% Coverage	1.405		
95% WH USL	1.353	95% HW USL	1.364

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.932	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.881	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.139	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.22	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	1.451	90% Percentile (z)	1.097
95% UPL (t)	1.233	95% Percentile (z)	1.188
95% USL	1.402	99% Percentile (z)	1.377

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	15	95% UTL with 95% Coverage	1.17
Approx, f used to compute achieved CC	0.789	Approximate Actual Confidence Coefficient achieved by UTL	0.537
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	1.17	95% BCA Bootstrap UTL with 95% Coverage	1.17
95% UPL	1.17	90% Percentile	1.046
90% Chebyshev UPL	1.411	95% Percentile	1.086
95% Chebyshev UPL	1.665	99% Percentile	1.153
95% USL	1.17		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Th232 BSB

General Statistics

Total Number of Observations	15	Number of Distinct Observations	13
Minimum	0.368	First Quartile	0.842
Second Largest	1.16	Median	1.01

Maximum	1.24	Third Quartile	1.085
Mean	0.938	SD	0.223
Coefficient of Variation	0.238	Skewness	-1.243
Mean of logged Data	-0.1	SD of logged Data	0.302

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.566	d2max (for USL)	2.409

Normal GOF Test

Shapiro Wilk Test Statistic	0.904	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.881	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.193	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.22	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	1.51	90% Percentile (z)	1.223
	95% UPL (t)	1.343	95% Percentile (z)	1.304
	95% USL	1.475	99% Percentile (z)	1.456

Gamma GOF Test

A-D Test Statistic	0.902	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.216	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.221	Detected data appear Gamma Distributed at 5% Significance Level

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics

k hat (MLE)	14.09	k star (bias corrected MLE)	11.32
Theta hat (MLE)	0.0665	Theta star (bias corrected MLE)	0.0829
nu hat (MLE)	422.7	nu star (bias corrected)	339.5
MLE Mean (bias corrected)	0.938	MLE Sd (bias corrected)	0.279

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL		1.461	90% Percentile	1.308
95% Hawkins Wixley (HW) Approx. Gamma UPL		1.483	95% Percentile	1.438
95% WH Approx. Gamma UTL with	95% Coverage	1.735	99% Percentile	1.704
95% HW Approx. Gamma UTL with	95% Coverage	1.781		
	95% WH USL	1.675	95% HW USL	1.715

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.788	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.881	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.217	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.22	Data appear Lognormal at 5% Significance Level

Data appear Approximate Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with	95% Coverage	1.966	90% Percentile (z)		1.333
	95% UPL (t)	1.568	95% Percentile (z)		1.488
	95% USL	1.875	99% Percentile (z)		1.828

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r		15	95% UTL with	95% Coverage	1.24
Approx, f used to compute achieved CC		0.789	Approximate Actual Confidence Coefficient achieved by UTL		0.537
			Approximate Sample Size needed to achieve specified CC		59
95% Percentile Bootstrap UTL with	95% Coverage	1.24	95% BCA Bootstrap UTL with	95% Coverage	1.24
	95% UPL	1.24		90% Percentile	1.132
	90% Chebyshev UPL	1.629		95% Percentile	1.184
	95% Chebyshev UPL	1.942		99% Percentile	1.229
	95% USL	1.24			

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

U234 BSB

General Statistics

Total Number of Observations	15	Number of Distinct Observations	15
Minimum	0.432	First Quartile	0.567
Second Largest	0.869	Median	0.62
Maximum	1.05	Third Quartile	0.847
Mean	0.683	SD	0.169
Coefficient of Variation	0.248	Skewness	0.736
Mean of logged Data	-0.408	SD of logged Data	0.24

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.566	d2max (for USL)	2.409

Normal GOF Test

Shapiro Wilk Test Statistic	0.906	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.881	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.2	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.22	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	1.117	90% Percentile (z)		0.9

95% UPL (t)	0.991	95% Percentile (z)	0.961
95% USL	1.091	99% Percentile (z)	1.077

Gamma GOF Test

A-D Test Statistic	0.628	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.735	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.176	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.221	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	18.44	k star (bias corrected MLE)	14.8
Theta hat (MLE)	0.037	Theta star (bias corrected MLE)	0.0462
nu hat (MLE)	553.2	nu star (bias corrected)	443.9
MLE Mean (bias corrected)	0.683	MLE Sd (bias corrected)	0.178

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	1.012	90% Percentile	0.918
95% Hawkins Wixley (HW) Approx. Gamma UPL	1.016	95% Percentile	0.999
95% WH Approx. Gamma UTL with 95% Coverage	1.181	99% Percentile	1.163
95% HW Approx. Gamma UTL with 95% Coverage	1.192		
95% WH USL	1.144	95% HW USL	1.153

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.936	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.881	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.171	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.22	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	1.231	90% Percentile (z)	0.904
95% UPL (t)	1.029	95% Percentile (z)	0.987
95% USL	1.185	99% Percentile (z)	1.162

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	15	95% UTL with 95% Coverage	1.05
Approx, f used to compute achieved CC	0.789	Approximate Actual Confidence Coefficient achieved by UTL	0.537
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	1.05	95% BCA Bootstrap UTL with 95% Coverage	1.05
95% UPL	1.05	90% Percentile	0.862
90% Chebyshev UPL	1.207	95% Percentile	0.923
95% Chebyshev UPL	1.445	99% Percentile	1.025
95% USL	1.05		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

U235 BSB

General Statistics

Total Number of Observations	15	Number of Distinct Observations	15
Minimum	8.8100E-4	First Quartile	0.0252
Second Largest	0.059	Median	0.0414
Maximum	0.0634	Third Quartile	0.0542
Mean	0.0364	SD	0.0203
Coefficient of Variation	0.557	Skewness	-0.514
Mean of logged Data	-3.671	SD of logged Data	1.178

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.566	d2max (for USL)	2.409

Normal GOF Test

Shapiro Wilk Test Statistic	0.922	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.881	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.174	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.22	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	0.0885	90% Percentile (z)	0.0624
	95% UPL (t)	0.0733	95% Percentile (z)	0.0698
	95% USL	0.0853	99% Percentile (z)	0.0836

Gamma GOF Test

A-D Test Statistic	1.162	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.753	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.253	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.225	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.54	k star (bias corrected MLE)	1.277
Theta hat (MLE)	0.0237	Theta star (bias corrected MLE)	0.0285
nu hat (MLE)	46.21	nu star (bias corrected)	38.3
MLE Mean (bias corrected)	0.0364	MLE Sd (bias corrected)	0.0322

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	0.107	90% Percentile	0.079
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.119	95% Percentile	0.1
95% WH Approx. Gamma UTL with 95% Coverage	0.158	99% Percentile	0.149
95% HW Approx. Gamma UTL with 95% Coverage	0.188		
95% WH USL	0.146	95% HW USL	0.171

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.732	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.881	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.27	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.22	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	0.523	90% Percentile (z)	0.115
95% UPL (t)	0.217	95% Percentile (z)	0.177
95% USL	0.434	99% Percentile (z)	0.394

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	15	95% UTL with 95% Coverage	0.0634
Approx, f used to compute achieved CC	0.789	Approximate Actual Confidence Coefficient achieved by UTL	0.537
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	0.0634	95% BCA Bootstrap UTL with 95% Coverage	0.0634
95% UPL	0.0634	90% Percentile	0.058
90% Chebyshev UPL	0.0993	95% Percentile	0.0603
95% Chebyshev UPL	0.128	99% Percentile	0.0628
95% USL	0.0634		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

U238 BSB

General Statistics

Total Number of Observations	15	Number of Distinct Observations	15
Minimum	0.398	First Quartile	0.63
Second Largest	0.997	Median	0.713
Maximum	1.05	Third Quartile	0.828
Mean	0.733	SD	0.171
Coefficient of Variation	0.234	Skewness	0.0973
Mean of logged Data	-0.338	SD of logged Data	0.247

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.566	d2max (for USL)	2.409

Normal GOF Test

Shapiro Wilk Test Statistic	0.98	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.881	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.113	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.22	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	1.173	90% Percentile (z)	0.952
	95% UPL (t)	1.044	95% Percentile (z)	1.015
	95% USL	1.146	99% Percentile (z)	1.131

Gamma GOF Test

A-D Test Statistic	0.196	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.735	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.12	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.221	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	18.54	k star (bias corrected MLE)	14.88
Theta hat (MLE)	0.0395	Theta star (bias corrected MLE)	0.0492
nu hat (MLE)	556.3	nu star (bias corrected)	446.4
MLE Mean (bias corrected)	0.733	MLE Sd (bias corrected)	0.19

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL		1.085	90% Percentile	0.984
95% Hawkins Wixley (HW) Approx. Gamma UPL		1.092	95% Percentile	1.07
95% WH Approx. Gamma UTL with	95% Coverage	1.265	99% Percentile	1.245
95% HW Approx. Gamma UTL with	95% Coverage	1.281		
	95% WH USL	1.225	95% HW USL	1.24

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.962	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.881	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.124	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.22	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with	95% Coverage	1.343	90% Percentile (z)	0.978
	95% UPL (t)	1.117	95% Percentile (z)	1.07
	95% USL	1.292	99% Percentile (z)	1.266

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	15	95% UTL with 95% Coverage	1.05
Approx, f used to compute achieved CC	0.789	Approximate Actual Confidence Coefficient achieved by UTL	0.537
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	1.05	95% BCA Bootstrap UTL with 95% Coverage	1.05
95% UPL	1.05	90% Percentile	0.946
90% Chebyshev UPL	1.264	95% Percentile	1.013
95% Chebyshev UPL	1.505	99% Percentile	1.043
95% USL	1.05		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Exposure Unit and Background Wilcoxon-Mann-Whitney Tests (Soils)

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Uncensor Full Data Sets without NDs

User Selected Options	
Date/Time of Computation	ProUCL 5.19/15/2020 11:22:18
From File	Site EU Data.xls
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: Ra226 SB

Sample 2 Data: Ra226 BSB

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	178	15
Number of Distinct Observations	171	15
Minimum	0.431	0.618
Maximum	155.2	1.3
Mean	2.832	0.867
Median	1.057	0.838
SD	13.77	0.196
SE of Mean	1.032	0.0507

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	17837
Standardized WMW U-Stat	2.746
Mean (U)	1335
SD(U) - Adj ties	207.8
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	0.00302

Conclusion with Alpha = 0.05

Reject H0, Conclude Sample 1 > Sample 2

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Uncensor Full Data Sets without NDs

User Selected Options	
Date/Time of Computation	ProUCL 5.19/15/2020 11:16:43
From File	Site EU Data.xls
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: Ra226 SS

Sample 2 Data: Ra226 BSS

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	89	15
Number of Distinct Observations	88	14
Minimum	0.229	0.394
Maximum	22.64	0.921
Mean	1.704	0.744
Median	0.934	0.777
SD	3.088	0.142
SE of Mean	0.327	0.0366

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	5040
Standardized WMW U-Stat	3.391
Mean (U)	667.5
SD(U) - Adj ties	108.1
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	3.4811E-4

Conclusion with Alpha = 0.05

Reject H0, Conclude Sample 1 > Sample 2

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Uncensor Full Data Sets without NDs

User Selected Options	
Date/Time of Computation	ProUCL 5.19/15/2020 11:22:51
From File	Site EU Data.xls
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: Ra228 SB

Sample 2 Data: Ra228 BSB

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	178	15
Number of Distinct Observations	165	14
Minimum	0.224	0.691
Maximum	1.537	1.24
Mean	0.867	0.967
Median	0.872	0.973
SD	0.268	0.172
SE of Mean	0.0201	0.0443

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	16931
Standardized WMW U-Stat	-1.617
Mean (U)	1335
SD(U) - Adj ties	207.8
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	0.947

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 <= Sample 2

P-Value >= alpha (0.05)

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Uncensor Full Data Sets without NDs

User Selected Options	
Date/Time of Computation	ProUCL 5.19/15/2020 11:18:04
From File	Site EU Data.xls
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: Ra228 SS

Sample 2 Data: Ra228 BSS

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	89	15
Number of Distinct Observations	87	15
Minimum	0.106	0.365
Maximum	1.418	1.26
Mean	0.815	0.903
Median	0.826	0.956
SD	0.301	0.239
SE of Mean	0.032	0.0617

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	4550
Standardized WMW U-Stat	-1.138
Mean (U)	667.5
SD(U) - Adj ties	108.1
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	0.872

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 <= Sample 2

P-Value >= alpha (0.05)

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Uncensor Full Data Sets without NDs

User Selected Options	
Date/Time of Computation	ProUCL 5.19/15/2020 11:23:21
From File	Site EU Data.xls
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: Th228 SB

Sample 2 Data: Th228 BSB

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	177	15
Number of Distinct Observations	160	15
Minimum	0.049	0.722
Maximum	1.37	1.55
Mean	0.812	1.131
Median	0.805	1.13
SD	0.19	0.274
SE of Mean	0.0143	0.0707

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	16227
Standardized WMW U-Stat	-4.135
Mean (U)	1328
SD(U) - Adj ties	206.6
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	1

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 <= Sample 2

P-Value >= alpha (0.05)

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Uncensor Full Data Sets without NDs

User Selected Options	
Date/Time of Computation	ProUCL 5.19/15/2020 11:19:03
From File	Site EU Data.xls
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: Th228 SS

Sample 2 Data: Th228 BSS

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	89	15
Number of Distinct Observations	84	14
Minimum	0.059	0.595
Maximum	1.532	1.64
Mean	0.79	1.085
Median	0.812	1.05
SD	0.261	0.258
SE of Mean	0.0277	0.0667

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	4250
Standardized WMW U-Stat	-3.918
Mean (U)	667.5
SD(U) - Adj ties	108.1
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	1

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 <= Sample 2

P-Value >= alpha (0.05)

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Uncensor Full Data Sets without NDs

User Selected Options	
Date/Time of Computation	ProUCL 5.19/15/2020 11:23:48
From File	Site EU Data.xls
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: Th230 SB

Sample 2 Data: Th230 BSB

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	177	15
Number of Distinct Observations	161	15
Minimum	0.097	0.6
Maximum	228.7	1.17
Mean	2.341	0.849
Median	0.913	0.864
SD	17.14	0.181
SE of Mean	1.289	0.0468

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	17349
Standardized WMW U-Stat	1.295
Mean (U)	1328
SD(U) - Adj ties	206.6
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	0.0977

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 <= Sample 2

P-Value >= alpha (0.05)

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Uncensor Full Data Sets without NDs

User Selected Options	
Date/Time of Computation	ProUCL 5.19/15/2020 11:19:35
From File	Site EU Data.xls
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: Th230 SS

Sample 2 Data: Th230 BSS

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	89	15
Number of Distinct Observations	88	15
Minimum	0.243	0.444
Maximum	26.88	1.62
Mean	1.325	0.927
Median	0.87	0.867
SD	2.878	0.264
SE of Mean	0.305	0.0681

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	4644
Standardized WMW U-Stat	-0.273
Mean (U)	667.5
SD(U) - Adj ties	108.1
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	0.608

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 <= Sample 2

P-Value >= alpha (0.05)

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Uncensor Full Data Sets without NDs

User Selected Options	
Date/Time of Computation	ProUCL 5.19/15/2020 11:24:17
From File	Site EU Data.xls
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: Th232 SB

Sample 2 Data: Th232 BSB

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	177	15
Number of Distinct Observations	153	13
Minimum	-0.059	0.368
Maximum	1.347	1.24
Mean	0.784	0.938
Median	0.775	1.01
SD	0.218	0.223
SE of Mean	0.0164	0.0576

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	16487
Standardized WMW U-Stat	-2.877
Mean (U)	1328
SD(U) - Adj ties	206.6
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	0.998

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 <= Sample 2

P-Value >= alpha (0.05)

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Uncensor Full Data Sets without NDs

User Selected Options	
Date/Time of Computation	ProUCL 5.19/15/2020 11:20:15
From File	Site EU Data.xls
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: Th232 SS

Sample 2 Data: Th232 BSS

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	89	15
Number of Distinct Observations	83	15
Minimum	0.111	0.473
Maximum	1.517	1.24
Mean	0.731	0.879
Median	0.715	0.95
SD	0.26	0.228
SE of Mean	0.0276	0.0588

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	4443
Standardized WMW U-Stat	-2.128
Mean (U)	667.5
SD(U) - Adj ties	108.1
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	0.983

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 <= Sample 2

P-Value >= alpha (0.05)

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Uncensor Full Data Sets without NDs

User Selected Options	
Date/Time of Computation	ProUCL 5.19/15/2020 11:24:46
From File	Site EU Data.xls
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: U234 SB

Sample 2 Data: U234 BSB

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	178	15
Number of Distinct Observations	170	15
Minimum	0.348	0.432
Maximum	8.252	1.05
Mean	1.131	0.683
Median	0.94	0.62
SD	0.825	0.169
SE of Mean	0.0619	0.0437

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	18012
Standardized WMW U-Stat	3.588
Mean (U)	1335
SD(U) - Adj ties	207.8
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	1.6645E-4

Conclusion with Alpha = 0.05

Reject H0, Conclude Sample 1 > Sample 2

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Uncensor Full Data Sets without NDs

User Selected Options	
Date/Time of Computation	ProUCL 5.19/15/2020 11:20:50
From File	Site EU Data.xls
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: U234 SS

Sample 2 Data: U234 BSS

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	88	15
Number of Distinct Observations	84	15
Minimum	0.253	0.281
Maximum	3.793	1.68
Mean	0.808	0.913
Median	0.727	0.856
SD	0.429	0.342
SE of Mean	0.0457	0.0883

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	4384
Standardized WMW U-Stat	-1.804
Mean (U)	660
SD(U) - Adj ties	107
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	0.964

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 <= Sample 2

P-Value >= alpha (0.05)

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Uncensor Full Data Sets without NDs

User Selected Options	
Date/Time of Computation	ProUCL 5.19/15/2020 11:25:12
From File	Site EU Data.xls
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: U235 SB

Sample 2 Data: U235 BSB

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	178	15
Number of Distinct Observations	78	15
Minimum	-0.107	8.8100E-4
Maximum	0.292	0.0634
Mean	0.0397	0.0364
Median	0.034	0.0414
SD	0.0362	0.0203
SE of Mean	0.00271	0.00524

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	17265
Standardized WMW U-Stat	-0.00963
Mean (U)	1335
SD(U) - Adj ties	207.7
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	0.504

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 <= Sample 2

P-Value >= alpha (0.05)

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Uncensor Full Data Sets without NDs

User Selected Options	
Date/Time of Computation	ProUCL 5.19/15/2020 11:21:19
From File	Site EU Data.xls
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: U235 SS

Sample 2 Data: U235 BSS

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	88	15
Number of Distinct Observations	57	15
Minimum	-0.087	0
Maximum	0.108	0.102
Mean	0.0275	0.0465
Median	0.0235	0.0422
SD	0.0277	0.0271
SE of Mean	0.00295	0.00699

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	4305
Standardized WMW U-Stat	-2.539
Mean (U)	660
SD(U) - Adj ties	106.9
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	0.994

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 <= Sample 2

P-Value >= alpha (0.05)

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Uncensor Full Data Sets without NDs

User Selected Options	
Date/Time of Computation	ProUCL 5.19/15/2020 11:25:40
From File	Site EU Data.xls
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: U238 SB

Sample 2 Data: U238 BSB

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	178	15
Number of Distinct Observations	162	15
Minimum	0.312	0.398
Maximum	8.023	1.05
Mean	1.116	0.733
Median	0.956	0.713
SD	0.788	0.171
SE of Mean	0.0591	0.0443

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	17894
Standardized WMW U-Stat	3.018
Mean (U)	1335
SD(U) - Adj ties	207.8
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	0.00127

Conclusion with Alpha = 0.05

Reject H0, Conclude Sample 1 > Sample 2

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Uncensor Full Data Sets without NDs

User Selected Options	
Date/Time of Computation	ProUCL 5.19/15/2020 11:21:51
From File	Site EU Data.xls
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: U238 SS

Sample 2 Data: U238 BSS

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	88	15
Number of Distinct Observations	85	15
Minimum	0.275	0.367
Maximum	4.051	1.36
Mean	0.831	0.86
Median	0.721	0.822
SD	0.457	0.294
SE of Mean	0.0487	0.076

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	4446
Standardized WMW U-Stat	-1.225
Mean (U)	660
SD(U) - Adj ties	107
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	0.89

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 <= Sample 2

P-Value >= alpha (0.05)

Background BTV Output
(Surface Water and Groundwater)

Background Statistics for Uncensored Full Data Sets

User Selected Options

Date/Time of Computation	ProUCL 5.19/15/2020 10:56:07
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
New or Future K Observations	1
Number of Bootstrap Operations	2000

Ra226 SW

General Statistics

Total Number of Observations	10	Number of Distinct Observations	10
Minimum	0.0416	First Quartile	0.176
Second Largest	0.449	Median	0.246
Maximum	0.487	Third Quartile	0.438
Mean	0.275	SD	0.168
Coefficient of Variation	0.61	Skewness	-0.102
Mean of logged Data	-1.566	SD of logged Data	0.904

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.911	d2max (for USL)	2.176

Normal GOF Test

Shapiro Wilk Test Statistic	0.897	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.842	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.219	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.262	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	0.763	90% Percentile (z)	0.49
	95% UPL (t)	0.598	95% Percentile (z)	0.551
	95% USL	0.64	99% Percentile (z)	0.665

Gamma GOF Test

A-D Test Statistic	0.578	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.216	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.27	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.968	k star (bias corrected MLE)	1.444
Theta hat (MLE)	0.14	Theta star (bias corrected MLE)	0.19
nu hat (MLE)	39.35	nu star (bias corrected)	28.88

MLE Mean (bias corrected)	0.275	MLE Sd (bias corrected)	0.229

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	0.798	90% Percentile	0.578
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.856	95% Percentile	0.725
95% WH Approx. Gamma UTL with 95% Coverage	1.286	99% Percentile	1.058
95% HW Approx. Gamma UTL with 95% Coverage	1.472		
95% WH USL	0.908	95% HW USL	0.991

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.827	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.842	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.21	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.262	Data appear Lognormal at 5% Significance Level	

Data appear Approximate Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	2.904	90% Percentile (z)	0.665
95% UPL (t)	1.188	95% Percentile (z)	0.924
95% USL	1.494	99% Percentile (z)	1.712

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	10	95% UTL with 95% Coverage	0.487
Approx, f used to compute achieved CC	0.526	Approximate Actual Confidence Coefficient achieved by UTL	0.401
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	0.487	95% BCA Bootstrap UTL with 95% Coverage	0.487
95% UPL	0.487	90% Percentile	0.453
90% Chebyshev UPL	0.803	95% Percentile	0.47
95% Chebyshev UPL	1.042	99% Percentile	0.484
95% USL	0.487		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.

The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Ra228 SW

General Statistics

Total Number of Observations	10	Number of Distinct Observations	10
Minimum	0.417	First Quartile	0.503
Second Largest	1.26	Median	0.659
Maximum	1.43	Third Quartile	1.024

Mean	0.787	SD	0.364
Coefficient of Variation	0.463	Skewness	0.709
Mean of logged Data	-0.333	SD of logged Data	0.453

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.911	d2max (for USL)	2.176

Normal GOF Test

Shapiro Wilk Test Statistic	0.887	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.842	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.243	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.262	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	1.847	90% Percentile (z)	1.254
95% UPL (t)	1.487	95% Percentile (z)	1.386
95% USL	1.579	99% Percentile (z)	1.634

Gamma GOF Test

A-D Test Statistic	0.447	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.729	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.242	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.267	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	5.504	k star (bias corrected MLE)	3.92
Theta hat (MLE)	0.143	Theta star (bias corrected MLE)	0.201
nu hat (MLE)	110.1	nu star (bias corrected)	78.4
MLE Mean (bias corrected)	0.787	MLE Sd (bias corrected)	0.398

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	1.604	90% Percentile	1.32
95% Hawkins Wixley (HW) Approx. Gamma UPL	1.626	95% Percentile	1.534
95% WH Approx. Gamma UTL with 95% Coverage	2.235	99% Percentile	1.991
95% HW Approx. Gamma UTL with 95% Coverage	2.319		
95% WH USL	1.753	95% HW USL	1.787

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.913	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.222	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.262	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with	95% Coverage	2.677	90% Percentile (z)		1.28
	95% UPL (t)	1.711	95% Percentile (z)		1.509
	95% USL	1.919	99% Percentile (z)		2.054

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r		10	95% UTL with	95% Coverage	1.43
Approx, f used to compute achieved CC		0.526	Approximate Actual Confidence Coefficient achieved by UTL		0.401
			Approximate Sample Size needed to achieve specified CC		59
95% Percentile Bootstrap UTL with	95% Coverage	1.43	95% BCA Bootstrap UTL with	95% Coverage	1.43
	95% UPL	1.43		90% Percentile	1.277
	90% Chebyshev UPL	1.933		95% Percentile	1.354
	95% Chebyshev UPL	2.452		99% Percentile	1.415
	95% USL	1.43			

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Th228 SW

General Statistics

Total Number of Observations	10	Number of Distinct Observations	10
Minimum	0.0635	First Quartile	0.0909
Second Largest	0.132	Median	0.116
Maximum	0.262	Third Quartile	0.13
Mean	0.121	SD	0.0544
Coefficient of Variation	0.449	Skewness	2.139
Mean of logged Data	-2.18	SD of logged Data	0.378

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.911	d2max (for USL)	2.176

Normal GOF Test

Shapiro Wilk Test Statistic	0.768	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.842	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.322	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.262	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	0.28	90% Percentile (z)		0.191
	95% UPL (t)	0.226	95% Percentile (z)		0.211

95% USL	0.24	99% Percentile (z)	0.248

Gamma GOF Test

A-D Test Statistic	0.544	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.727	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.262	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.267	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	7.245	k star (bias corrected MLE)	5.138
Theta hat (MLE)	0.0167	Theta star (bias corrected MLE)	0.0236
nu hat (MLE)	144.9	nu star (bias corrected)	102.8
MLE Mean (bias corrected)	0.121	MLE Sd (bias corrected)	0.0535

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	0.228	90% Percentile	0.193
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.229	95% Percentile	0.221
95% WH Approx. Gamma UTL with 95% Coverage	0.308	99% Percentile	0.279
95% HW Approx. Gamma UTL with 95% Coverage	0.314		
95% WH USL	0.247	95% HW USL	0.249

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.919	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.241	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.262	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	0.339	90% Percentile (z)	0.183
95% UPL (t)	0.234	95% Percentile (z)	0.21
95% USL	0.257	99% Percentile (z)	0.272

Nonparametric Distribution Free Background Statistics

Data appear Gamma Distributed at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	10	95% UTL with 95% Coverage	0.262
Approx, f used to compute achieved CC	0.526	Approximate Actual Confidence Coefficient achieved by UTL	0.401
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	0.262	95% BCA Bootstrap UTL with 95% Coverage	0.262
95% UPL	0.262	90% Percentile	0.145
90% Chebyshev UPL	0.293	95% Percentile	0.204
95% Chebyshev UPL	0.37	99% Percentile	0.25
95% USL	0.262		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Th230 SW

General Statistics

Total Number of Observations	10	Number of Distinct Observations	9
Minimum	-0.0526	First Quartile	0.0998
Second Largest	0.576	Median	0.298
Maximum	0.606	Third Quartile	0.395
Mean	0.278	SD	0.216
Coefficient of Variation	0.777	Skewness	0.154

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.911	d2max (for USL)	2.176

Normal GOF Test

Shapiro Wilk Test Statistic	0.954	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.842	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.128	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.262	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	0.908	90% Percentile (z)	0.555
	95% UPL (t)	0.694	95% Percentile (z)	0.634
	95% USL	0.749	99% Percentile (z)	0.781

Gamma Statistics

Gamma Statistics Not Available

Dataset Contains Values <= 0 - Cannot Compute Gamma Statistics

Dataset Contains Values <= 0 - Cannot Compute Log Statistics

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r		10	95% UTL with 95% Coverage	0.606
Approx, f used to compute achieved CC		0.526	Approximate Actual Confidence Coefficient achieved by UTL	0.401
			Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with	95% Coverage	0.606	95% BCA Bootstrap UTL with 95% Coverage	0.606
	95% UPL	0.606	90% Percentile	0.579

90% Chebyshev UPL	0.959	95% Percentile	0.593
95% Chebyshev UPL	1.267	99% Percentile	0.603
95% USL	0.606		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Th232 SW

General Statistics

Total Number of Observations	10	Number of Distinct Observations	10
Minimum	-0.043	First Quartile	-0.00843
Second Largest	0.0681	Median	0.0135
Maximum	0.0699	Third Quartile	0.0301
Mean	0.0154	SD	0.0362
Coefficient of Variation	2.347	Skewness	0.195

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.911	d2max (for USL)	2.176

Normal GOF Test

Shapiro Wilk Test Statistic	0.932	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.842	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.171	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.262	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	0.121	90% Percentile (z)	0.0618
	95% UPL (t)	0.0851	95% Percentile (z)	0.075
	95% USL	0.0942	99% Percentile (z)	0.0997

Gamma Statistics

Gamma Statistics Not Available

Dataset Contains Values <= 0 - Cannot Compute Gamma Statistics

Dataset Contains Values <= 0 - Cannot Compute Log Statistics

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	10	95% UTL with	95% Coverage	0.0699

Approx, f used to compute achieved CC		0.526	Approximate Actual Confidence Coefficient achieved by UTL		0.401
			Approximate Sample Size needed to achieve specified CC		59
95% Percentile Bootstrap UTL with	95% Coverage	0.0699	95% BCA Bootstrap UTL with	95% Coverage	0.0699
	95% UPL	0.0699		90% Percentile	0.0683
	90% Chebyshev UPL	0.129		95% Percentile	0.0691
	95% Chebyshev UPL	0.181		99% Percentile	0.0697
	95% USL	0.0699			

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

U234 SW

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Minimum	0.252	First Quartile	0.958
Second Largest	1.76	Median	1.17
Maximum	5.78	Third Quartile	1.468
Mean	1.657	SD	1.725
Coefficient of Variation	1.041	Skewness	2.447
Mean of logged Data	0.158	SD of logged Data	0.876

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.187	d2max (for USL)	2.032

Normal GOF Test

Shapiro Wilk Test Statistic	0.673	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.351	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	7.155	90% Percentile (z)		3.868
	95% UPL (t)	5.124	95% Percentile (z)		4.494
	95% USL	5.162	99% Percentile (z)		5.67

Gamma GOF Test

A-D Test Statistic	0.55	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.728	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.241	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.299	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.587	k star (bias corrected MLE)	1.075
Theta hat (MLE)	1.044	Theta star (bias corrected MLE)	1.541
nu hat (MLE)	25.4	nu star (bias corrected)	17.21
MLE Mean (bias corrected)	1.657	MLE Sd (bias corrected)	1.598

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	5.461	90% Percentile	3.747
95% Hawkins Wixley (HW) Approx. Gamma UPL	5.643	95% Percentile	4.838
95% WH Approx. Gamma UTL with 95% Coverage	9.958	99% Percentile	7.358
95% HW Approx. Gamma UTL with 95% Coverage	11.01		
95% WH USL	5.529	95% HW USL	5.72

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.933	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.196	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	19.12	90% Percentile (z)	3.6
95% UPL (t)	6.813	95% Percentile (z)	4.949
95% USL	6.946	99% Percentile (z)	8.992

Nonparametric Distribution Free Background Statistics

Data appear Gamma Distributed at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	8	95% UTL with 95% Coverage	5.78
Approx, f used to compute achieved CC	0.421	Approximate Actual Confidence Coefficient achieved by UTL	0.337
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	5.78	95% BCA Bootstrap UTL with 95% Coverage	5.78
95% UPL	5.78	90% Percentile	2.966
90% Chebyshev UPL	7.146	95% Percentile	4.373
95% Chebyshev UPL	9.633	99% Percentile	5.499
95% USL	5.78		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

U235 SW

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Minimum	-0.0156	First Quartile	0.0939
Second Largest	0.301	Median	0.114
Maximum	0.529	Third Quartile	0.213
Mean	0.174	SD	0.17
Coefficient of Variation	0.98	Skewness	1.46

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.187	d2max (for USL)	2.032

Normal GOF Test

Shapiro Wilk Test Statistic	0.866	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.262	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.283	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	0.717	90% Percentile (z)	0.392
	95% UPL (t)	0.516	95% Percentile (z)	0.454
	95% USL	0.52	99% Percentile (z)	0.57

Gamma Statistics

Gamma Statistics Not Available

Dataset Contains Values <= 0 - Cannot Compute Gamma Statistics

Dataset Contains Values <= 0 - Cannot Compute Log Statistics

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r		8	95% UTL with	95% Coverage	0.529
Approx, f used to compute achieved CC		0.421	Approximate Actual Confidence Coefficient achieved by UTL		0.337
			Approximate Sample Size needed to achieve specified CC		59
95% Percentile Bootstrap UTL with	95% Coverage	0.529	95% BCA Bootstrap UTL with	95% Coverage	0.529
	95% UPL	0.529		90% Percentile	0.369
	90% Chebyshev UPL	0.716		95% Percentile	0.449
	95% Chebyshev UPL	0.961		99% Percentile	0.513
	95% USL	0.529			

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.

The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

U238 SW

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Minimum	0.196	First Quartile	0.759
Second Largest	1.67	Median	1.175
Maximum	4.81	Third Quartile	1.4
Mean	1.465	SD	1.429
Coefficient of Variation	0.975	Skewness	2.242
Mean of logged Data	0.0333	SD of logged Data	0.917

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.187	d2max (for USL)	2.032

Normal GOF Test

Shapiro Wilk Test Statistic	0.735	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.318	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.283	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	6.018	90% Percentile (z)	3.296
	95% UPL (t)	4.336	95% Percentile (z)	3.815
	95% USL	4.367	99% Percentile (z)	4.788

Gamma GOF Test

A-D Test Statistic	0.36	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.728	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.207	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.299	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.58	k star (bias corrected MLE)	1.071
Theta hat (MLE)	0.927	Theta star (bias corrected MLE)	1.368
nu hat (MLE)	25.28	nu star (bias corrected)	17.13
MLE Mean (bias corrected)	1.465	MLE Sd (bias corrected)	1.416

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL		4.861	90% Percentile	3.317
95% Hawkins Wixley (HW) Approx. Gamma UPL		5.089	95% Percentile	4.284
95% WH Approx. Gamma UTL with	95% Coverage	8.867	99% Percentile	6.52
95% HW Approx. Gamma UTL with	95% Coverage	9.985		
	95% WH USL	4.922	95% HW USL	5.159

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.956	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.176	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with	95% Coverage	19.23	90% Percentile (z)	3.349
	95% UPL (t)	6.53	95% Percentile (z)	4.674
	95% USL	6.664	99% Percentile (z)	8.732

Nonparametric Distribution Free Background Statistics

Data appear Gamma Distributed at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	8	95% UTL with 95% Coverage	4.81
Approx, f used to compute achieved CC	0.421	Approximate Actual Confidence Coefficient achieved by UTL	0.337
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	4.81	95% BCA Bootstrap UTL with 95% Coverage	4.81
95% UPL	4.81	90% Percentile	2.612
90% Chebyshev UPL	6.011	95% Percentile	3.711
95% Chebyshev UPL	8.07	99% Percentile	4.59
95% USL	4.81		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Ra226 GW

General Statistics

Total Number of Observations	24	Number of Distinct Observations	24
Minimum	-0.07	First Quartile	0.332
Second Largest	1.39	Median	0.468
Maximum	1.76	Third Quartile	0.707
Mean	0.554	SD	0.401
Coefficient of Variation	0.724	Skewness	1.389

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.309	d2max (for USL)	2.644

Normal GOF Test

Shapiro Wilk Test Statistic	0.898	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.916	Data Not Normal at 5% Significance Level

Lilliefors Test Statistic	0.141	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.177	Data appear Normal at 5% Significance Level	

Data appear Approximate Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	1.481	90% Percentile (z)	1.068
	95% UPL (t)	1.256	95% Percentile (z)	1.214
	95% USL	1.615	99% Percentile (z)	1.488

Gamma Statistics

Gamma Statistics Not Available

Dataset Contains Values <= 0 - Cannot Compute Gamma Statistics

Dataset Contains Values <= 0 - Cannot Compute Log Statistics

Nonparametric Distribution Free Background Statistics

Data appear Approximate Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r		24	95% UTL with	95% Coverage	1.76
Approx, f used to compute achieved CC		1.263	Approximate Actual Confidence Coefficient achieved by UTL		0.708
			Approximate Sample Size needed to achieve specified CC		59
95% Percentile Bootstrap UTL with	95% Coverage	1.76	95% BCA Bootstrap UTL with	95% Coverage	1.76
	95% UPL	1.668		90% Percentile	0.894
	90% Chebyshev UPL	1.783		95% Percentile	1.318
	95% Chebyshev UPL	2.34		99% Percentile	1.675
	95% USL	1.76			

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Ra228 GW

General Statistics

Total Number of Observations	24	Number of Distinct Observations	23
Minimum	0.323	First Quartile	0.542
Second Largest	1.19	Median	0.739
Maximum	1.67	Third Quartile	0.972
Mean	0.761	SD	0.311
Coefficient of Variation	0.409	Skewness	0.931
Mean of logged Data	-0.354	SD of logged Data	0.414

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.309	d2max (for USL)	2.644

Normal GOF Test

Shapiro Wilk Test Statistic	0.932	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.916	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.101	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.177	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	1.479	90% Percentile (z)	1.159
	95% UPL (t)	1.305	95% Percentile (z)	1.272
	95% USL	1.583	99% Percentile (z)	1.484

Gamma GOF Test

A-D Test Statistic	0.31	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.746	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.102	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.178	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	6.422	k star (bias corrected MLE)	5.647
Theta hat (MLE)	0.118	Theta star (bias corrected MLE)	0.135
nu hat (MLE)	308.3	nu star (bias corrected)	271.1
MLE Mean (bias corrected)	0.761	MLE Sd (bias corrected)	0.32

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL		1.373	90% Percentile	1.189
95% Hawkins Wixley (HW) Approx. Gamma UPL		1.388	95% Percentile	1.352
95% WH Approx. Gamma UTL with	95% Coverage	1.644	99% Percentile	1.695
95% HW Approx. Gamma UTL with	95% Coverage	1.68		
	95% WH USL	1.821	95% HW USL	1.874

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.965	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.916	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.101	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.177	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with	95% Coverage	1.826	90% Percentile (z)	1.194
	95% UPL (t)	1.448	95% Percentile (z)	1.387
	95% USL	2.098	99% Percentile (z)	1.839

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	24	95% UTL with 95% Coverage	1.67
Approx, f used to compute achieved CC	1.263	Approximate Actual Confidence Coefficient achieved by UTL	0.708
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	1.67	95% BCA Bootstrap UTL with 95% Coverage	1.67
95% UPL	1.55	90% Percentile	1.031
90% Chebyshev UPL	1.713	95% Percentile	1.168
95% Chebyshev UPL	2.145	99% Percentile	1.56
95% USL	1.67		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Th228 GW

General Statistics

Total Number of Observations	24	Number of Distinct Observations	23
Minimum	-0.0137	First Quartile	0.0624
Second Largest	0.275	Median	0.101
Maximum	0.324	Third Quartile	0.163
Mean	0.119	SD	0.0874
Coefficient of Variation	0.735	Skewness	0.7

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.309	d2max (for USL)	2.644

Normal GOF Test

Shapiro Wilk Test Statistic	0.952	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.916	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.147	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.177	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	0.321	90% Percentile (z)	0.231
95% UPL (t)	0.272	95% Percentile (z)	0.263
95% USL	0.35	99% Percentile (z)	0.322

Gamma Statistics

Gamma Statistics Not Available

Dataset Contains Values <= 0 - Cannot Compute Gamma Statistics

Dataset Contains Values <= 0 - Cannot Compute Log Statistics

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	24	95% UTL with 95% Coverage	0.324
Approx, f used to compute achieved CC	1.263	Approximate Actual Confidence Coefficient achieved by UTL	0.708
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	0.324	95% BCA Bootstrap UTL with 95% Coverage	0.317
95% UPL	0.312	90% Percentile	0.241
90% Chebyshev UPL	0.387	95% Percentile	0.271
95% Chebyshev UPL	0.508	99% Percentile	0.313
95% USL	0.324		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Th230 GW

General Statistics

Total Number of Observations	24	Number of Distinct Observations	24
Minimum	0.285	First Quartile	0.43
Second Largest	0.815	Median	0.493
Maximum	0.877	Third Quartile	0.616
Mean	0.526	SD	0.154
Coefficient of Variation	0.292	Skewness	0.656
Mean of logged Data	-0.683	SD of logged Data	0.289

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.309	d2max (for USL)	2.644

Normal GOF Test

Shapiro Wilk Test Statistic	0.954	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.916	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.138	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.177	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	0.881	90% Percentile (z)	0.723
95% UPL (t)	0.795	95% Percentile (z)	0.779
95% USL	0.932	99% Percentile (z)	0.883

Gamma GOF Test

A-D Test Statistic	0.231	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.744	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.101	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.178	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	12.64	k star (bias corrected MLE)	11.09
Theta hat (MLE)	0.0416	Theta star (bias corrected MLE)	0.0474
nu hat (MLE)	606.9	nu star (bias corrected)	532.4
MLE Mean (bias corrected)	0.526	MLE Sd (bias corrected)	0.158

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	0.818	90% Percentile	0.736
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.823	95% Percentile	0.81
95% WH Approx. Gamma UTL with 95% Coverage	0.937	99% Percentile	0.961
95% HW Approx. Gamma UTL with 95% Coverage	0.948		
95% WH USL	1.014	95% HW USL	1.029

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.981	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.916	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.0868	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.177	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	0.986	90% Percentile (z)	0.732
95% UPL (t)	0.838	95% Percentile (z)	0.813
95% USL	1.086	99% Percentile (z)	0.991

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	24	95% UTL with 95% Coverage	0.877
Approx, f used to compute achieved CC	1.263	Approximate Actual Confidence Coefficient achieved by UTL	0.708
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	0.877	95% BCA Bootstrap UTL with 95% Coverage	0.877
95% UPL	0.862	90% Percentile	0.734
90% Chebyshev UPL	0.996	95% Percentile	0.803
95% Chebyshev UPL	1.209	99% Percentile	0.863
95% USL	0.877		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.

Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Th232 GW

General Statistics

Total Number of Observations	24	Number of Distinct Observations	24
Minimum	3.2500E-4	First Quartile	0.0426
Second Largest	0.229	Median	0.0646
Maximum	0.264	Third Quartile	0.0897
Mean	0.0792	SD	0.0635
Coefficient of Variation	0.802	Skewness	1.701
Mean of logged Data	-2.947	SD of logged Data	1.283

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.309	d2max (for USL)	2.644

Normal GOF Test

Shapiro Wilk Test Statistic	0.822	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.916	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.214	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.177	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	0.226	90% Percentile (z)	0.161
	95% UPL (t)	0.19	95% Percentile (z)	0.184
	95% USL	0.247	99% Percentile (z)	0.227

Gamma GOF Test

A-D Test Statistic	0.768	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.764	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.172	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.182	Detected data appear Gamma Distributed at 5% Significance Level

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.359	k star (bias corrected MLE)	1.217
Theta hat (MLE)	0.0582	Theta star (bias corrected MLE)	0.065
nu hat (MLE)	65.25	nu star (bias corrected)	58.43
MLE Mean (bias corrected)	0.0792	MLE Sd (bias corrected)	0.0718

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	0.223	90% Percentile	0.174
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.244	95% Percentile	0.221

95% WH Approx. Gamma UTL with	95% Coverage	0.304		99% Percentile	0.331
95% HW Approx. Gamma UTL with	95% Coverage	0.349			
	95% WH USL	0.361		95% HW USL	0.426

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.721	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.916	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.252	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.177	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with	95% Coverage	1.015		90% Percentile (z)	0.272
	95% UPL (t)	0.495		95% Percentile (z)	0.433
	95% USL	1.56		99% Percentile (z)	1.038

Nonparametric Distribution Free Background Statistics

Data appear Approximate Gamma Distribution at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

	Order of Statistic, r	24	95% UTL with	95% Coverage	0.264
	Approx, f used to compute achieved CC	1.263	Approximate Actual Confidence Coefficient achieved by UTL		0.708
			Approximate Sample Size needed to achieve specified CC		59
95% Percentile Bootstrap UTL with	95% Coverage	0.264	95% BCA Bootstrap UTL with	95% Coverage	0.264
	95% UPL	0.255		90% Percentile	0.155
	90% Chebyshev UPL	0.274		95% Percentile	0.218
	95% Chebyshev UPL	0.362		99% Percentile	0.256
	95% USL	0.264			

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.

The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

U234 GW

General Statistics

Total Number of Observations	24	Number of Distinct Observations	24
Minimum	0.21	First Quartile	0.517
Second Largest	8.19	Median	1.35
Maximum	8.73	Third Quartile	4.238
Mean	2.549	SD	2.721
Coefficient of Variation	1.068	Skewness	1.147
Mean of logged Data	0.316	SD of logged Data	1.187

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.309	d2max (for USL)	2.644

Normal GOF Test

Shapiro Wilk Test Statistic	0.796	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.916	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.271	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.177	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	8.832	90% Percentile (z)	6.036
	95% UPL (t)	7.309	95% Percentile (z)	7.025
	95% USL	9.744	99% Percentile (z)	8.879

Gamma GOF Test

A-D Test Statistic	0.871	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.774	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.17	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.183	Detected data appear Gamma Distributed at 5% Significance Level

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.939	k star (bias corrected MLE)	0.849
Theta hat (MLE)	2.715	Theta star (bias corrected MLE)	3.002
nu hat (MLE)	45.05	nu star (bias corrected)	40.75
MLE Mean (bias corrected)	2.549	MLE Sd (bias corrected)	2.766

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL		8.369	90% Percentile	6.108
95% Hawkins Wixley (HW) Approx. Gamma UPL		8.743	95% Percentile	8.093
95% WH Approx. Gamma UTL with	95% Coverage	12.12	99% Percentile	12.76
95% HW Approx. Gamma UTL with	95% Coverage	13.27		
	95% WH USL	14.82	95% HW USL	16.7

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.931	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.916	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.15	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.177	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with	95% Coverage	21.27	90% Percentile (z)	6.28
	95% UPL (t)	10.94	95% Percentile (z)	9.667
	95% USL	31.65	99% Percentile (z)	21.71

Nonparametric Distribution Free Background Statistics

Data appear Approximate Gamma Distribution at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	24	95% UTL with 95% Coverage	8.73
Approx, f used to compute achieved CC	1.263	Approximate Actual Confidence Coefficient achieved by UTL	0.708
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	8.73	95% BCA Bootstrap UTL with 95% Coverage	8.73
95% UPL	8.595	90% Percentile	6.81
90% Chebyshev UPL	10.88	95% Percentile	8.06
95% Chebyshev UPL	14.66	99% Percentile	8.606
95% USL	8.73		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

U235 GW

General Statistics

Total Number of Observations	24	Number of Distinct Observations	23
Minimum	-0.0164	First Quartile	0.0341
Second Largest	0.651	Median	0.121
Maximum	0.715	Third Quartile	0.189
Mean	0.17	SD	0.2
Coefficient of Variation	1.179	Skewness	1.8

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.309	d2max (for USL)	2.644

Normal GOF Test

Shapiro Wilk Test Statistic	0.761	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.916	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.25	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.177	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	0.633	90% Percentile (z)	0.427
95% UPL (t)	0.521	95% Percentile (z)	0.5
95% USL	0.7	99% Percentile (z)	0.636

Gamma Statistics

Gamma Statistics Not Available

Dataset Contains Values <= 0 - Cannot Compute Gamma Statistics

Dataset Contains Values <= 0 - Cannot Compute Log Statistics

Nonparametric Distribution Free Background Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	24	95% UTL with 95% Coverage	0.715
Approx, f used to compute achieved CC	1.263	Approximate Actual Confidence Coefficient achieved by UTL	0.708
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	0.715	95% BCA Bootstrap UTL with 95% Coverage	0.715
95% UPL	0.699	90% Percentile	0.482
90% Chebyshev UPL	0.784	95% Percentile	0.639
95% Chebyshev UPL	1.062	99% Percentile	0.7
95% USL	0.715		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

U238 GW

General Statistics

Total Number of Observations	24	Number of Distinct Observations	24
Minimum	0.0332	First Quartile	0.232
Second Largest	4.36	Median	0.785
Maximum	5.79	Third Quartile	3.213
Mean	1.638	SD	1.782
Coefficient of Variation	1.088	Skewness	0.902
Mean of logged Data	-0.421	SD of logged Data	1.629

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.309	d2max (for USL)	2.644

Normal GOF Test

Shapiro Wilk Test Statistic	0.82	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.916	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.233	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.177	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	5.753	90% Percentile (z)	3.922
95% UPL (t)	4.755	95% Percentile (z)	4.57
95% USL	6.35	99% Percentile (z)	5.784

Gamma GOF Test

A-D Test Statistic	0.602	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.791	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.171	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.186	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.666	k star (bias corrected MLE)	0.61
Theta hat (MLE)	2.461	Theta star (bias corrected MLE)	2.685
nu hat (MLE)	31.95	nu star (bias corrected)	29.29
MLE Mean (bias corrected)	1.638	MLE Sd (bias corrected)	2.097

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	6.086	90% Percentile	4.245
95% Hawkins Wixley (HW) Approx. Gamma UPL	6.645	95% Percentile	5.86
95% WH Approx. Gamma UTL with 95% Coverage	9.174	99% Percentile	9.76
95% HW Approx. Gamma UTL with 95% Coverage	10.71		
95% WH USL	11.44	95% HW USL	13.89

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.924	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.916	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.164	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.177	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	28.23	90% Percentile (z)	5.296
95% UPL (t)	11.34	95% Percentile (z)	9.571
95% USL	48.72	99% Percentile (z)	29.04

Nonparametric Distribution Free Background Statistics

Data appear Gamma Distributed at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	24	95% UTL with 95% Coverage	5.79
Approx, f used to compute achieved CC	1.263	Approximate Actual Confidence Coefficient achieved by UTL	0.708
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	5.79	95% BCA Bootstrap UTL with 95% Coverage	5.576
95% UPL	5.433	90% Percentile	4.165
90% Chebyshev UPL	7.095	95% Percentile	4.347
95% Chebyshev UPL	9.566	99% Percentile	5.461
95% USL	5.79		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.

Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.

The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Exposure Unit EPC Output (Soils)

UCL Statistics for Uncensored Full Data Sets

User Selected Options	
Date/Time of Computation	ProUCL 5.19/15/2020 09:51:44
From File	Site EU Data.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Ra226 SS

General Statistics

Total Number of Observations	89	Number of Distinct Observations	88
		Number of Missing Observations	0
Minimum	0.229	Mean	1.704
Maximum	22.64	Median	0.934
SD	3.088	Std. Error of Mean	0.327
Coefficient of Variation	1.812	Skewness	5.302

Normal GOF Test

Shapiro Wilk Test Statistic	0.366	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.389	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0941	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	2.248	95% Adjusted-CLT UCL (Chen-1995)	2.439
		95% Modified-t UCL (Johnson-1978)	2.279

Gamma GOF Test

A-D Test Statistic	12.69	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.776	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.333	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.097	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.276	k star (bias corrected MLE)	1.241
Theta hat (MLE)	1.336	Theta star (bias corrected MLE)	1.374
nu hat (MLE)	227.1	nu star (bias corrected)	220.8
MLE Mean (bias corrected)	1.704	MLE Sd (bias corrected)	1.53
		Approximate Chi Square Value (0.05)	187.4
Adjusted Level of Significance	0.0473	Adjusted Chi Square Value	186.9

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	2.008	95% Adjusted Gamma UCL (use when n<50)	2.013

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.784	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.255	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.0941	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-1.474	Mean of logged Data	0.0927
Maximum of Logged Data	3.12	SD of logged Data	0.726

Assuming Lognormal Distribution

95% H-UCL	1.671	90% Chebyshev (MVUE) UCL	1.787
95% Chebyshev (MVUE) UCL	1.952	97.5% Chebyshev (MVUE) UCL	2.181
99% Chebyshev (MVUE) UCL	2.632		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	2.243	95% Jackknife UCL	2.248
95% Standard Bootstrap UCL	2.238	95% Bootstrap-t UCL	2.898
95% Hall's Bootstrap UCL	4.391	95% Percentile Bootstrap UCL	2.311
95% BCA Bootstrap UCL	2.499		
90% Chebyshev(Mean, Sd) UCL	2.686	95% Chebyshev(Mean, Sd) UCL	3.131
97.5% Chebyshev(Mean, Sd) UCL	3.748	99% Chebyshev(Mean, Sd) UCL	4.961

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL	3.131

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Ra228 SS

General Statistics

Total Number of Observations	89	Number of Distinct Observations	87
		Number of Missing Observations	0
Minimum	0.106	Mean	0.815
Maximum	1.418	Median	0.826
SD	0.301	Std. Error of Mean	0.032

Coefficient of Variation	0.37	Skewness	-0.168

Normal GOF Test

Shapiro Wilk Test Statistic	0.974	**Shapiro Wilk GOF Test**
5% Shapiro Wilk P Value	0.301	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.0611	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0941	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.868	95% Adjusted-CLT UCL (Chen-1995)	0.867
		95% Modified-t UCL (Johnson-1978)	0.868

Gamma GOF Test

A-D Test Statistic	1.387	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.754	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.102	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.095	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	5.519	k star (bias corrected MLE)	5.34
Theta hat (MLE)	0.148	Theta star (bias corrected MLE)	0.153
nu hat (MLE)	982.3	nu star (bias corrected)	950.6
MLE Mean (bias corrected)	0.815	MLE Sd (bias corrected)	0.353
		Approximate Chi Square Value (0.05)	880
Adjusted Level of Significance	0.0473	Adjusted Chi Square Value	878.9

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	0.88	95% Adjusted Gamma UCL (use when n<50)	0.882

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.867	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk P Value	4.676E-11	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.123	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.0941	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-2.244	Mean of logged Data	-0.298
Maximum of Logged Data	0.349	SD of logged Data	0.488

Assuming Lognormal Distribution

95% H-UCL	0.92	90% Chebyshev (MVUE) UCL	0.971
95% Chebyshev (MVUE) UCL	1.033	97.5% Chebyshev (MVUE) UCL	1.119
99% Chebyshev (MVUE) UCL	1.287		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	0.868	95% Jackknife UCL	0.868
95% Standard Bootstrap UCL	0.868	95% Bootstrap-t UCL	0.865
95% Hall's Bootstrap UCL	0.865	95% Percentile Bootstrap UCL	0.866
95% BCA Bootstrap UCL	0.864		
90% Chebyshev(Mean, Sd) UCL	0.911	95% Chebyshev(Mean, Sd) UCL	0.954
97.5% Chebyshev(Mean, Sd) UCL	1.015	99% Chebyshev(Mean, Sd) UCL	1.133

Suggested UCL to Use

95% Student's-t UCL	0.868

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

Th228 SS

General Statistics

Total Number of Observations	89	Number of Distinct Observations	84
		Number of Missing Observations	0
Minimum	0.059	Mean	0.79
Maximum	1.532	Median	0.812
SD	0.261	Std. Error of Mean	0.0277
Coefficient of Variation	0.33	Skewness	-0.401

Normal GOF Test

Shapiro Wilk Test Statistic	0.951	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk P Value	0.00676	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.125	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0941	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.836	95% Adjusted-CLT UCL (Chen-1995)	0.834
		95% Modified-t UCL (Johnson-1978)	0.836

Gamma GOF Test

A-D Test Statistic	5.089	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.754	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.202	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.095	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	5.511	k star (bias corrected MLE)	5.333
Theta hat (MLE)	0.143	Theta star (bias corrected MLE)	0.148
nu hat (MLE)	981	nu star (bias corrected)	949.3
MLE Mean (bias corrected)	0.79	MLE Sd (bias corrected)	0.342
		Approximate Chi Square Value (0.05)	878.7
Adjusted Level of Significance	0.0473	Adjusted Chi Square Value	877.6

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	0.853	95% Adjusted Gamma UCL (use when n<50)	0.854

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.706	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.231	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.0941	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-2.83	Mean of logged Data	-0.329
Maximum of Logged Data	0.427	SD of logged Data	0.533

Assuming Lognormal Distribution

95% H-UCL	0.922	90% Chebyshev (MVUE) UCL	0.976
95% Chebyshev (MVUE) UCL	1.044	97.5% Chebyshev (MVUE) UCL	1.137
99% Chebyshev (MVUE) UCL	1.321		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	0.835	95% Jackknife UCL	0.836
95% Standard Bootstrap UCL	0.835	95% Bootstrap-t UCL	0.834
95% Hall's Bootstrap UCL	0.835	95% Percentile Bootstrap UCL	0.834
95% BCA Bootstrap UCL	0.831		
90% Chebyshev(Mean, Sd) UCL	0.873	95% Chebyshev(Mean, Sd) UCL	0.91
97.5% Chebyshev(Mean, Sd) UCL	0.963	99% Chebyshev(Mean, Sd) UCL	1.065

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL	0.91

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

Th230 SS

General Statistics

Total Number of Observations	89	Number of Distinct Observations	88
		Number of Missing Observations	0
Minimum	0.243	Mean	1.325
Maximum	26.88	Median	0.87
SD	2.878	Std. Error of Mean	0.305
Coefficient of Variation	2.171	Skewness	8.277

Normal GOF Test

Shapiro Wilk Test Statistic	0.248	**Shapiro Wilk GOF Test**
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.377	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0941	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	1.832	95% Adjusted-CLT UCL (Chen-1995)	2.113
		95% Modified-t UCL (Johnson-1978)	1.877

Gamma GOF Test

A-D Test Statistic	10.16	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.771	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.274	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.0965	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.523	k star (bias corrected MLE)	1.48
Theta hat (MLE)	0.87	Theta star (bias corrected MLE)	0.896
nu hat (MLE)	271.2	nu star (bias corrected)	263.4
MLE Mean (bias corrected)	1.325	MLE Sd (bias corrected)	1.089
		Approximate Chi Square Value (0.05)	226.8
Adjusted Level of Significance	0.0473	Adjusted Chi Square Value	226.2

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	1.539	95% Adjusted Gamma UCL (use when n<50)	1.543

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.835	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk P Value	2.454E-14	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.173	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.0941	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-1.415	Mean of logged Data	-0.0812
Maximum of Logged Data	3.291	SD of logged Data	0.612

Assuming Lognormal Distribution

95% H-UCL	1.26	90% Chebyshev (MVUE) UCL	1.342
95% Chebyshev (MVUE) UCL	1.448	97.5% Chebyshev (MVUE) UCL	1.594
99% Chebyshev (MVUE) UCL	1.882		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	1.827	95% Jackknife UCL	1.832
95% Standard Bootstrap UCL	1.815	95% Bootstrap-t UCL	3.673
95% Hall's Bootstrap UCL	3.652	95% Percentile Bootstrap UCL	1.871
95% BCA Bootstrap UCL	2.254		
90% Chebyshev(Mean, Sd) UCL	2.24	95% Chebyshev(Mean, Sd) UCL	2.655
97.5% Chebyshev(Mean, Sd) UCL	3.23	99% Chebyshev(Mean, Sd) UCL	4.36

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL	2.655

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Th232 SS

General Statistics

Total Number of Observations	89	Number of Distinct Observations	83
		Number of Missing Observations	0
Minimum	0.111	Mean	0.731
Maximum	1.517	Median	0.715
SD	0.26	Std. Error of Mean	0.0276
Coefficient of Variation	0.356	Skewness	0.228

Normal GOF Test

Shapiro Wilk Test Statistic	0.964	**Shapiro Wilk GOF Test**
5% Shapiro Wilk P Value	0.0699	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.0974	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0941	Data Not Normal at 5% Significance Level

Data appear Approximate Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.777	95% Adjusted-CLT UCL (Chen-1995)	0.777
		95% Modified-t UCL (Johnson-1978)	0.777

Gamma GOF Test

A-D Test Statistic	2.447	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.754	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.152	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.0949	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	6.288	k star (bias corrected MLE)	6.084
Theta hat (MLE)	0.116	Theta star (bias corrected MLE)	0.12
nu hat (MLE)	1119	nu star (bias corrected)	1083
MLE Mean (bias corrected)	0.731	MLE Sd (bias corrected)	0.296
		Approximate Chi Square Value (0.05)	1007
Adjusted Level of Significance	0.0473	Adjusted Chi Square Value	1006

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	0.786	95% Adjusted Gamma UCL (use when n<50)	0.787

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.859	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk P Value	7.735E-12	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.186	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.0941	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-2.198	Mean of logged Data	-0.395
Maximum of Logged Data	0.417	SD of logged Data	0.452

Assuming Lognormal Distribution

95% H-UCL	0.814	90% Chebyshev (MVUE) UCL	0.857
95% Chebyshev (MVUE) UCL	0.908	97.5% Chebyshev (MVUE) UCL	0.978
99% Chebyshev (MVUE) UCL	1.116		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	0.776	95% Jackknife UCL	0.777
95% Standard Bootstrap UCL	0.775	95% Bootstrap-t UCL	0.778
95% Hall's Bootstrap UCL	0.778	95% Percentile Bootstrap UCL	0.779
95% BCA Bootstrap UCL	0.778		
90% Chebyshev(Mean, Sd) UCL	0.814	95% Chebyshev(Mean, Sd) UCL	0.851
97.5% Chebyshev(Mean, Sd) UCL	0.903	99% Chebyshev(Mean, Sd) UCL	1.006

Suggested UCL to Use

95% Student's-t UCL	0.777

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

U234 SS

General Statistics

Total Number of Observations	88	Number of Distinct Observations	84
		Number of Missing Observations	0
Minimum	0.253	Mean	0.808
Maximum	3.793	Median	0.727
SD	0.429	Std. Error of Mean	0.0457
Coefficient of Variation	0.531	Skewness	4.269

Normal GOF Test

Shapiro Wilk Test Statistic	0.682	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.214	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0946	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.884	95% Adjusted-CLT UCL (Chen-1995)	0.906
		95% Modified-t UCL (Johnson-1978)	0.888

Gamma GOF Test

A-D Test Statistic	2.032	**Anderson-Darling Gamma GOF Test**	

5% A-D Critical Value	0.754	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.143	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.0955	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	5.991	k star (bias corrected MLE)	5.794
Theta hat (MLE)	0.135	Theta star (bias corrected MLE)	0.139
nu hat (MLE)	1054	nu star (bias corrected)	1020
MLE Mean (bias corrected)	0.808	MLE Sd (bias corrected)	0.336
		Approximate Chi Square Value (0.05)	946.6
Adjusted Level of Significance	0.0473	Adjusted Chi Square Value	945.5

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	0.871	95% Adjusted Gamma UCL (use when n<50)	0.872

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.961	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk P Value	0.0395	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.11	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.0946	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-1.374	Mean of logged Data	-0.299
Maximum of Logged Data	1.333	SD of logged Data	0.391

Assuming Lognormal Distribution

95% H-UCL	0.863	90% Chebyshev (MVUE) UCL	0.903
95% Chebyshev (MVUE) UCL	0.95	97.5% Chebyshev (MVUE) UCL	1.015
99% Chebyshev (MVUE) UCL	1.143		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	0.883	95% Jackknife UCL	0.884
95% Standard Bootstrap UCL	0.883	95% Bootstrap-t UCL	0.92
95% Hall's Bootstrap UCL	1.211	95% Percentile Bootstrap UCL	0.888
95% BCA Bootstrap UCL	0.909		
90% Chebyshev(Mean, Sd) UCL	0.945	95% Chebyshev(Mean, Sd) UCL	1.008
97.5% Chebyshev(Mean, Sd) UCL	1.094	99% Chebyshev(Mean, Sd) UCL	1.263

Suggested UCL to Use

95% Student's-t UCL	0.884	or 95% Modified-t UCL	0.888

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

U235 SS

General Statistics

Total Number of Observations	88	Number of Distinct Observations	57
		Number of Missing Observations	0
Minimum	-0.087	Mean	0.0275
Maximum	0.108	Median	0.0235
SD	0.0277	Std. Error of Mean	0.00295
Coefficient of Variation	1.008	Skewness	-0.0907

Normal GOF Test

Shapiro Wilk Test Statistic	0.94	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk P Value	7.1688E-4	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.141	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0946	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.0324	95% Adjusted-CLT UCL (Chen-1995)	0.0323
		95% Modified-t UCL (Johnson-1978)	0.0324

Gamma Statistics Not Available

Lognormal Statistics Not Available

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	0.0323	95% Jackknife UCL	0.0324
95% Standard Bootstrap UCL	0.0323	95% Bootstrap-t UCL	0.0325
95% Hall's Bootstrap UCL	0.0325	95% Percentile Bootstrap UCL	0.032
95% BCA Bootstrap UCL	0.0323		
90% Chebyshev(Mean, Sd) UCL	0.0363	95% Chebyshev(Mean, Sd) UCL	0.0403
97.5% Chebyshev(Mean, Sd) UCL	0.0459	99% Chebyshev(Mean, Sd) UCL	0.0568

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL	0.0403

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

U238 SS

General Statistics

Total Number of Observations	88	Number of Distinct Observations	85
		Number of Missing Observations	0
Minimum	0.275	Mean	0.831
Maximum	4.051	Median	0.721
SD	0.457	Std. Error of Mean	0.0487
Coefficient of Variation	0.55	Skewness	4.559

Normal GOF Test

Shapiro Wilk Test Statistic	0.636	**Shapiro Wilk GOF Test**
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.206	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0946	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.912	95% Adjusted-CLT UCL (Chen-1995)	0.936
		95% Modified-t UCL (Johnson-1978)	0.915

Gamma GOF Test

A-D Test Statistic	3.013	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.754	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.149	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.0955	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	6.113	k star (bias corrected MLE)	5.913
Theta hat (MLE)	0.136	Theta star (bias corrected MLE)	0.14
nu hat (MLE)	1076	nu star (bias corrected)	1041
MLE Mean (bias corrected)	0.831	MLE Sd (bias corrected)	0.342
		Approximate Chi Square Value (0.05)	966.7
Adjusted Level of Significance	0.0473	Adjusted Chi Square Value	965.6

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	0.894	95% Adjusted Gamma UCL (use when n<50)	0.895

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.937	**Shapiro Wilk Lognormal GOF Test**

5% Shapiro Wilk P Value	4.2637E-4	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.113	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.0946	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-1.291	Mean of logged Data	-0.27
Maximum of Logged Data	1.399	SD of logged Data	0.376

Assuming Lognormal Distribution

95% H-UCL	0.88	90% Chebyshev (MVUE) UCL	0.92
95% Chebyshev (MVUE) UCL	0.966	97.5% Chebyshev (MVUE) UCL	1.03
99% Chebyshev (MVUE) UCL	1.156		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	0.911	95% Jackknife UCL	0.912
95% Standard Bootstrap UCL	0.91	95% Bootstrap-t UCL	0.97
95% Hall's Bootstrap UCL	1.271	95% Percentile Bootstrap UCL	0.911
95% BCA Bootstrap UCL	0.939		
90% Chebyshev(Mean, Sd) UCL	0.977	95% Chebyshev(Mean, Sd) UCL	1.043
97.5% Chebyshev(Mean, Sd) UCL	1.135	99% Chebyshev(Mean, Sd) UCL	1.315

Suggested UCL to Use

95% Student's-t UCL	0.912	or 95% Modified-t UCL	0.915

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Ra226 SB

General Statistics

Total Number of Observations	178	Number of Distinct Observations	171
		Number of Missing Observations	0
Minimum	0.431	Mean	2.832
Maximum	155.2	Median	1.057
SD	13.77	Std. Error of Mean	1.032
Coefficient of Variation	4.86	Skewness	9.828

Normal GOF Test

Shapiro Wilk Test Statistic	0.148	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level	

Lilliefors Test Statistic	0.431	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0668	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	4.538	95% Adjusted-CLT UCL (Chen-1995)	5.342
		95% Modified-t UCL (Johnson-1978)	4.665

Gamma GOF Test

A-D Test Statistic	5.618E+28	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.799	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.346	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.0723	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.717	k star (bias corrected MLE)	0.709
Theta hat (MLE)	3.95	Theta star (bias corrected MLE)	3.997
nu hat (MLE)	255.3	nu star (bias corrected)	252.3
MLE Mean (bias corrected)	2.832	MLE Sd (bias corrected)	3.364
		Approximate Chi Square Value (0.05)	216.5
Adjusted Level of Significance	0.0487	Adjusted Chi Square Value	216.2

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	3.3	95% Adjusted Gamma UCL (use when n<50)	3.304

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.716	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.206	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.0668	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-0.842	Mean of logged Data	0.201
Maximum of Logged Data	5.044	SD of logged Data	0.726

Assuming Lognormal Distribution

95% H-UCL	1.771	90% Chebyshev (MVUE) UCL	1.879
95% Chebyshev (MVUE) UCL	2.01	97.5% Chebyshev (MVUE) UCL	2.193
99% Chebyshev (MVUE) UCL	2.551		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	4.529	95% Jackknife UCL	4.538
95% Standard Bootstrap UCL	4.524	95% Bootstrap-t UCL	19.06
95% Hall's Bootstrap UCL	12.64	95% Percentile Bootstrap UCL	4.612
95% BCA Bootstrap UCL	5.679		
90% Chebyshev(Mean, Sd) UCL	5.928	95% Chebyshev(Mean, Sd) UCL	7.33
97.5% Chebyshev(Mean, Sd) UCL	9.276	99% Chebyshev(Mean, Sd) UCL	13.1

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL	7.33

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Ra228 SB

General Statistics

Total Number of Observations	178	Number of Distinct Observations	165
		Number of Missing Observations	0
Minimum	0.224	Mean	0.867
Maximum	1.537	Median	0.872
SD	0.268	Std. Error of Mean	0.0201
Coefficient of Variation	0.309	Skewness	0.0877

Normal GOF Test

Shapiro Wilk Test Statistic	0.979	**Shapiro Wilk GOF Test**
5% Shapiro Wilk P Value	0.298	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.0506	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0668	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.9	95% Adjusted-CLT UCL (Chen-1995)	0.9
		95% Modified-t UCL (Johnson-1978)	0.9

Gamma GOF Test

A-D Test Statistic	0.719	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.752	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.0606	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.0693	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	9.403	k star (bias corrected MLE)	9.248

Theta hat (MLE)	0.0922	Theta star (bias corrected MLE)	0.0937
nu hat (MLE)	3348	nu star (bias corrected)	3292
MLE Mean (bias corrected)	0.867	MLE Sd (bias corrected)	0.285
		Approximate Chi Square Value (0.05)	3160
Adjusted Level of Significance	0.0487	Adjusted Chi Square Value	3159

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	0.903	95% Adjusted Gamma UCL (use when n<50)	0.903

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.948	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk P Value	2.9063E-6	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0828	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.0668	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-1.496	Mean of logged Data	-0.197
Maximum of Logged Data	0.43	SD of logged Data	0.346

Assuming Lognormal Distribution

95% H-UCL	0.912	90% Chebyshev (MVUE) UCL	0.941
95% Chebyshev (MVUE) UCL	0.973	97.5% Chebyshev (MVUE) UCL	1.016
99% Chebyshev (MVUE) UCL	1.102		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	0.9	95% Jackknife UCL	0.9
95% Standard Bootstrap UCL	0.9	95% Bootstrap-t UCL	0.899
95% Hall's Bootstrap UCL	0.9	95% Percentile Bootstrap UCL	0.901
95% BCA Bootstrap UCL	0.901		
90% Chebyshev(Mean, Sd) UCL	0.927	95% Chebyshev(Mean, Sd) UCL	0.954
97.5% Chebyshev(Mean, Sd) UCL	0.992	99% Chebyshev(Mean, Sd) UCL	1.067

Suggested UCL to Use

95% Student's-t UCL	0.9

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Th228 SB

General Statistics

Total Number of Observations	177	Number of Distinct Observations	160
		Number of Missing Observations	0
Minimum	0.049	Mean	0.812
Maximum	1.37	Median	0.805
SD	0.19	Std. Error of Mean	0.0143
Coefficient of Variation	0.233	Skewness	-0.172

Normal GOF Test

Shapiro Wilk Test Statistic	0.98	**Shapiro Wilk GOF Test**
5% Shapiro Wilk P Value	0.369	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.0525	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.067	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.836	95% Adjusted-CLT UCL (Chen-1995)	0.836
		95% Modified-t UCL (Johnson-1978)	0.836

Gamma GOF Test

A-D Test Statistic	2.931	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.751	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.0944	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.0695	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	13.55	k star (bias corrected MLE)	13.32
Theta hat (MLE)	0.06	Theta star (bias corrected MLE)	0.061
nu hat (MLE)	4795	nu star (bias corrected)	4715
MLE Mean (bias corrected)	0.812	MLE Sd (bias corrected)	0.223
		Approximate Chi Square Value (0.05)	4557
Adjusted Level of Significance	0.0486	Adjusted Chi Square Value	4556

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	0.841	95% Adjusted Gamma UCL (use when n<50)	0.841

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.754	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.133	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.067	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-3.016	Mean of logged Data	-0.245

Maximum of Logged Data	0.315	SD of logged Data	0.32

Assuming Lognormal Distribution

95% H-UCL	0.859	90% Chebyshev (MVUE) UCL	0.884
95% Chebyshev (MVUE) UCL	0.912	97.5% Chebyshev (MVUE) UCL	0.95
99% Chebyshev (MVUE) UCL	1.025		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	0.836	95% Jackknife UCL	0.836
95% Standard Bootstrap UCL	0.835	95% Bootstrap-t UCL	0.834
95% Hall's Bootstrap UCL	0.837	95% Percentile Bootstrap UCL	0.835
95% BCA Bootstrap UCL	0.836		
90% Chebyshev(Mean, Sd) UCL	0.855	95% Chebyshev(Mean, Sd) UCL	0.874
97.5% Chebyshev(Mean, Sd) UCL	0.901	99% Chebyshev(Mean, Sd) UCL	0.954

Suggested UCL to Use

95% Student's-t UCL	0.836

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

Th230 SB

General Statistics

Total Number of Observations	177	Number of Distinct Observations	161
		Number of Missing Observations	0
Minimum	0.097	Mean	2.341
Maximum	228.7	Median	0.913
SD	17.14	Std. Error of Mean	1.289
Coefficient of Variation	7.323	Skewness	13.23

Normal GOF Test

Shapiro Wilk Test Statistic	0.0925	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.477	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.067	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	4.471	95% Adjusted-CLT UCL (Chen-1995)	5.829
		95% Modified-t UCL (Johnson-1978)	4.685

Gamma GOF Test

A-D Test Statistic	5.650E+28	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.803	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.393	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.0727	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.675	k star (bias corrected MLE)	0.668
Theta hat (MLE)	3.467	Theta star (bias corrected MLE)	3.507
nu hat (MLE)	239	nu star (bias corrected)	236.3
MLE Mean (bias corrected)	2.341	MLE Sd (bias corrected)	2.865
		Approximate Chi Square Value (0.05)	201.7
Adjusted Level of Significance	0.0486	Adjusted Chi Square Value	201.5

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	2.742	95% Adjusted Gamma UCL (use when n<50)	2.746

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.706	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.194	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.067	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-2.333	Mean of logged Data	-0.0491
Maximum of Logged Data	5.432	SD of logged Data	0.613

Assuming Lognormal Distribution

95% H-UCL	1.253	90% Chebyshev (MVUE) UCL	1.319
95% Chebyshev (MVUE) UCL	1.397	97.5% Chebyshev (MVUE) UCL	1.506
99% Chebyshev (MVUE) UCL	1.718		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	4.46	95% Jackknife UCL	4.471
95% Standard Bootstrap UCL	4.475	95% Bootstrap-t UCL	61.54
95% Hall's Bootstrap UCL	20.69	95% Percentile Bootstrap UCL	4.888
95% BCA Bootstrap UCL	6.335		

90% Chebyshev(Mean, Sd) UCL	6.206	95% Chebyshev(Mean, Sd) UCL	7.957
97.5% Chebyshev(Mean, Sd) UCL	10.39	99% Chebyshev(Mean, Sd) UCL	15.16

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL	7.957

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Th232 SB

General Statistics

Total Number of Observations	177	Number of Distinct Observations	153
		Number of Missing Observations	0
Minimum	-0.059	Mean	0.784
Maximum	1.347	Median	0.775
SD	0.218	Std. Error of Mean	0.0164
Coefficient of Variation	0.278	Skewness	-0.662

Normal GOF Test

Shapiro Wilk Test Statistic	0.952	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk P Value	2.0106E-5	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.0843	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.067	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.811	95% Adjusted-CLT UCL (Chen-1995)	0.81
		95% Modified-t UCL (Johnson-1978)	0.811

Gamma Statistics Not Available

Lognormal Statistics Not Available

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	0.811	95% Jackknife UCL	0.811
95% Standard Bootstrap UCL	0.811	95% Bootstrap-t UCL	0.81
95% Hall's Bootstrap UCL	0.81	95% Percentile Bootstrap UCL	0.81
95% BCA Bootstrap UCL	0.812		
90% Chebyshev(Mean, Sd) UCL	0.833	95% Chebyshev(Mean, Sd) UCL	0.855
97.5% Chebyshev(Mean, Sd) UCL	0.886	99% Chebyshev(Mean, Sd) UCL	0.947

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL	0.855

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

U234 SB

General Statistics

Total Number of Observations	178	Number of Distinct Observations	170
		Number of Missing Observations	0
Minimum	0.348	Mean	1.131
Maximum	8.252	Median	0.94
SD	0.825	Std. Error of Mean	0.0619
Coefficient of Variation	0.73	Skewness	5.308

Normal GOF Test

Shapiro Wilk Test Statistic	0.594	**Shapiro Wilk GOF Test**
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.193	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0668	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	1.233	95% Adjusted-CLT UCL (Chen-1995)	1.259
		95% Modified-t UCL (Johnson-1978)	1.237

Gamma GOF Test

A-D Test Statistic	3.171	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.757	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.0919	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.0696	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	3.909	k star (bias corrected MLE)	3.847
Theta hat (MLE)	0.289	Theta star (bias corrected MLE)	0.294
nu hat (MLE)	1392	nu star (bias corrected)	1370
MLE Mean (bias corrected)	1.131	MLE Sd (bias corrected)	0.577
		Approximate Chi Square Value (0.05)	1285

Adjusted Level of Significance	0.0487	Adjusted Chi Square Value	1284

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	1.206	95% Adjusted Gamma UCL (use when n<50)	1.206

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.956	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk P Value	1.4813E-4	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0553	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.0668	Data appear Lognormal at 5% Significance Level	

Data appear Approximate Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-1.056	Mean of logged Data	-0.0103
Maximum of Logged Data	2.11	SD of logged Data	0.473

Assuming Lognormal Distribution

95% H-UCL	1.18	90% Chebyshev (MVUE) UCL	1.23
95% Chebyshev (MVUE) UCL	1.286	97.5% Chebyshev (MVUE) UCL	1.363
99% Chebyshev (MVUE) UCL	1.516		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	1.233	95% Jackknife UCL	1.233
95% Standard Bootstrap UCL	1.231	95% Bootstrap-t UCL	1.281
95% Hall's Bootstrap UCL	1.346	95% Percentile Bootstrap UCL	1.24
95% BCA Bootstrap UCL	1.266		
90% Chebyshev(Mean, Sd) UCL	1.316	95% Chebyshev(Mean, Sd) UCL	1.4
97.5% Chebyshev(Mean, Sd) UCL	1.517	99% Chebyshev(Mean, Sd) UCL	1.746

Suggested UCL to Use

95% Student's-t UCL	1.233	or 95% Modified-t UCL	1.237
or 95% H-UCL	1.18		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

U235 SB

General Statistics

Total Number of Observations	178	Number of Distinct Observations	78
		Number of Missing Observations	0
Minimum	-0.107	Mean	0.0397
Maximum	0.292	Median	0.034
SD	0.0362	Std. Error of Mean	0.00271
Coefficient of Variation	0.912	Skewness	2.132

Normal GOF Test

Shapiro Wilk Test Statistic	0.841	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.134	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0668	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.0442	95% Adjusted-CLT UCL (Chen-1995)	0.0446
		95% Modified-t UCL (Johnson-1978)	0.0443

Gamma Statistics Not Available

Lognormal Statistics Not Available

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	0.0442	95% Jackknife UCL	0.0442
95% Standard Bootstrap UCL	0.0441	95% Bootstrap-t UCL	0.0448
95% Hall's Bootstrap UCL	0.0455	95% Percentile Bootstrap UCL	0.0444
95% BCA Bootstrap UCL	0.0448		
90% Chebyshev(Mean, Sd) UCL	0.0478	95% Chebyshev(Mean, Sd) UCL	0.0515
97.5% Chebyshev(Mean, Sd) UCL	0.0566	99% Chebyshev(Mean, Sd) UCL	0.0667

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL	0.0515

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

U238 SB

General Statistics

Total Number of Observations	178	Number of Distinct Observations	162
		Number of Missing Observations	0
Minimum	0.312	Mean	1.116
Maximum	8.023	Median	0.956
SD	0.788	Std. Error of Mean	0.0591
Coefficient of Variation	0.706	Skewness	5.5

Normal GOF Test

Shapiro Wilk Test Statistic	0.593	**Shapiro Wilk GOF Test**
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.205	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0668	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	1.214	95% Adjusted-CLT UCL (Chen-1995)	1.239
		95% Modified-t UCL (Johnson-1978)	1.218

Gamma GOF Test

A-D Test Statistic	3.197	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.756	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.106	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.0696	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	4.154	k star (bias corrected MLE)	4.087
Theta hat (MLE)	0.269	Theta star (bias corrected MLE)	0.273
nu hat (MLE)	1479	nu star (bias corrected)	1455
MLE Mean (bias corrected)	1.116	MLE Sd (bias corrected)	0.552
		Approximate Chi Square Value (0.05)	1368
Adjusted Level of Significance	0.0487	Adjusted Chi Square Value	1367

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	1.187	95% Adjusted Gamma UCL (use when n<50)	1.188

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.962	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk P Value	0.00181	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.0687	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.0668	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-1.165	Mean of logged Data	-0.0156
Maximum of Logged Data	2.082	SD of logged Data	0.46

Assuming Lognormal Distribution

95% H-UCL	1.165	90% Chebyshev (MVUE) UCL	1.213
95% Chebyshev (MVUE) UCL	1.266	97.5% Chebyshev (MVUE) UCL	1.341
99% Chebyshev (MVUE) UCL	1.488		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	1.213	95% Jackknife UCL	1.214
95% Standard Bootstrap UCL	1.209	95% Bootstrap-t UCL	1.272
95% Hall's Bootstrap UCL	1.366	95% Percentile Bootstrap UCL	1.219
95% BCA Bootstrap UCL	1.245		
90% Chebyshev(Mean, Sd) UCL	1.293	95% Chebyshev(Mean, Sd) UCL	1.373
97.5% Chebyshev(Mean, Sd) UCL	1.485	99% Chebyshev(Mean, Sd) UCL	1.703

Suggested UCL to Use

95% Student's-t UCL	1.214	or 95% Modified-t UCL	1.218

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

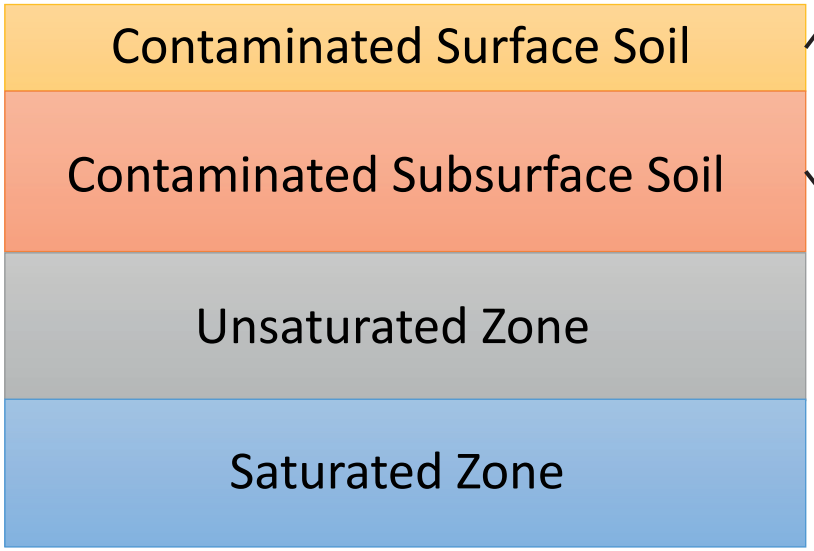
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX G
RESRAD Output Files

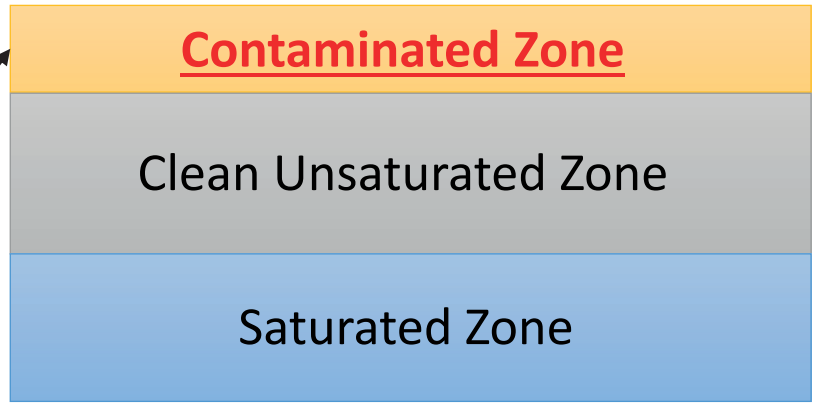
RESRAD Model Configuration:

- Industrial Worker
- Maintenance Worker
- Trespasser

Risk Assessment Source Configuration



RESRAD Surface Source



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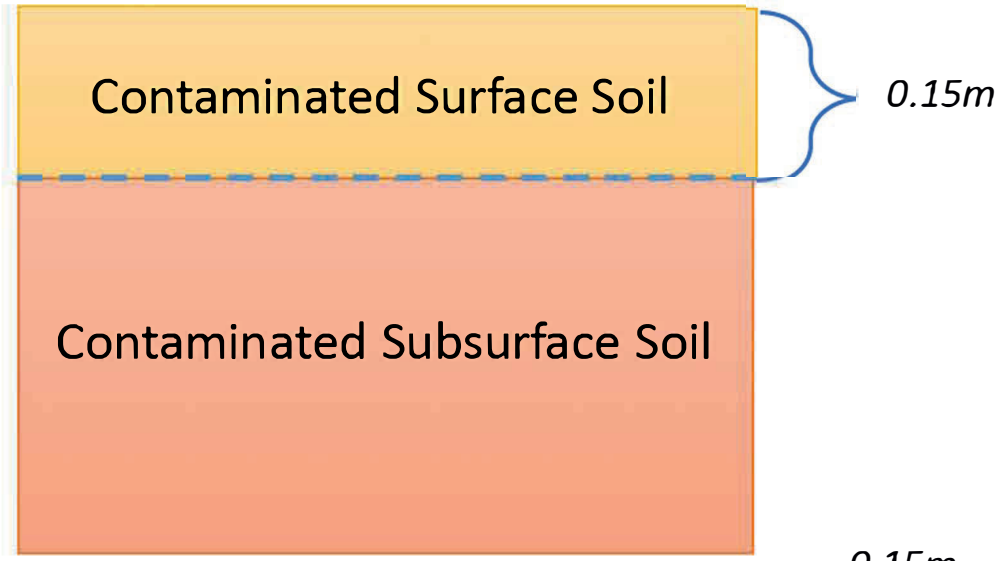
RESRAD Subsurface Source

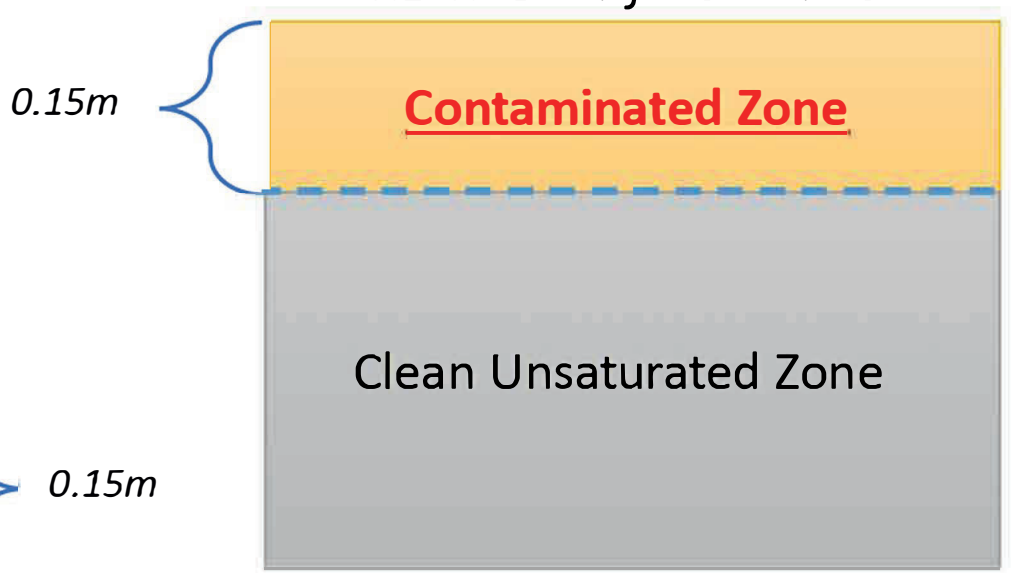
Soil Mixing Layer at Year 0:

- Industrial Worker
- Maintenance Worker
- Trespasser

Risk Assessment Source Configuration

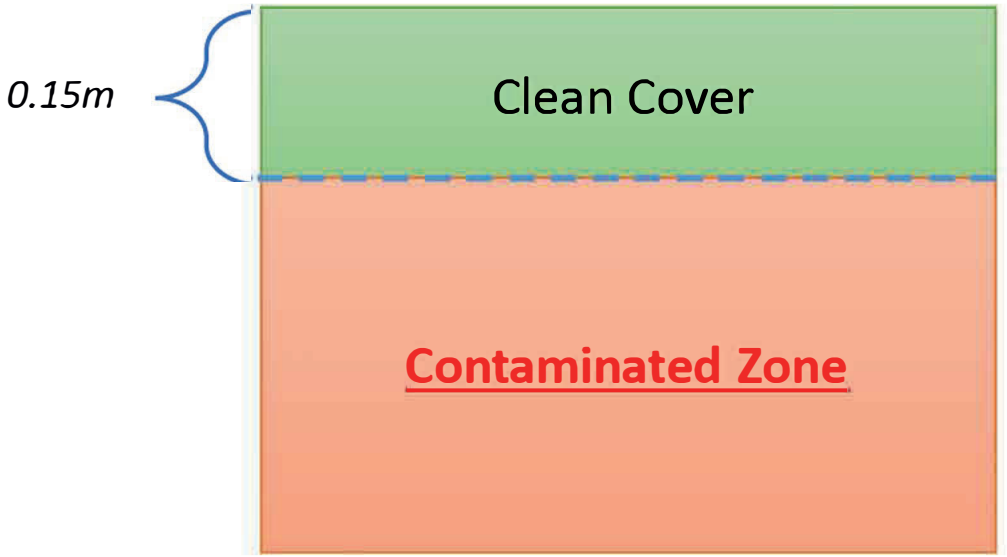


RESRAD Surface Source



+

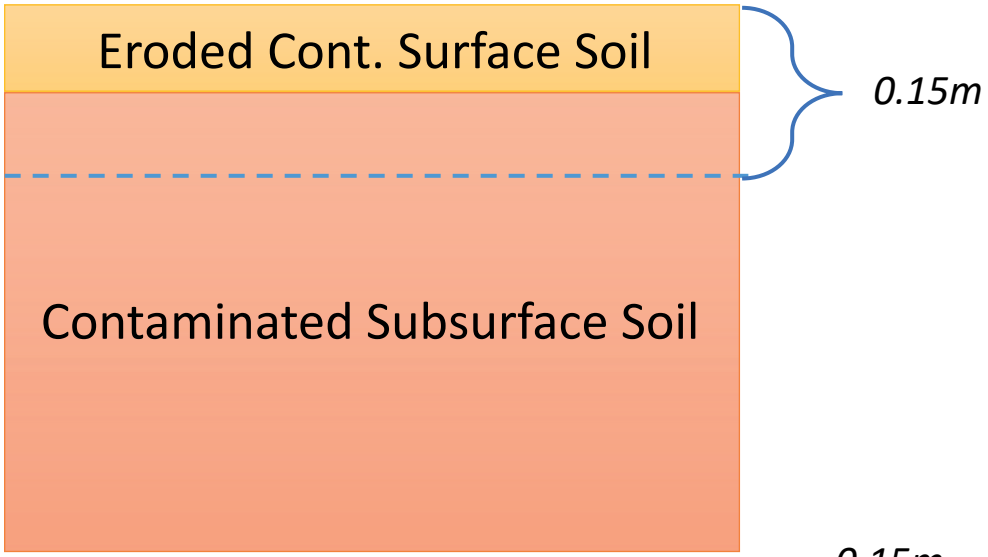
RESRAD Subsurface Source



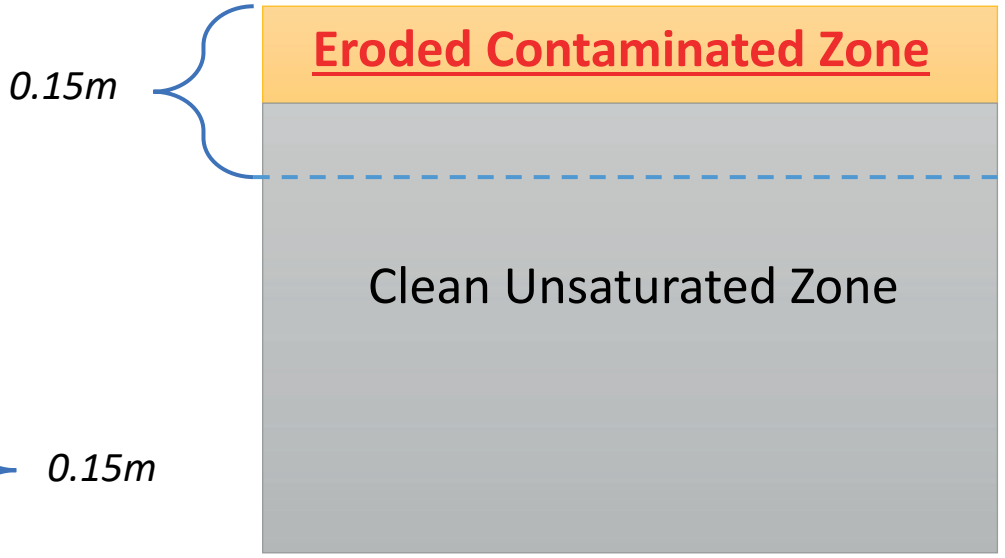
Soil Mixing Layer at Year > 0:

- Industrial Worker
- Maintenance Worker
- Trespasser

Risk Assessment Source Configuration



RESRAD Surface Source



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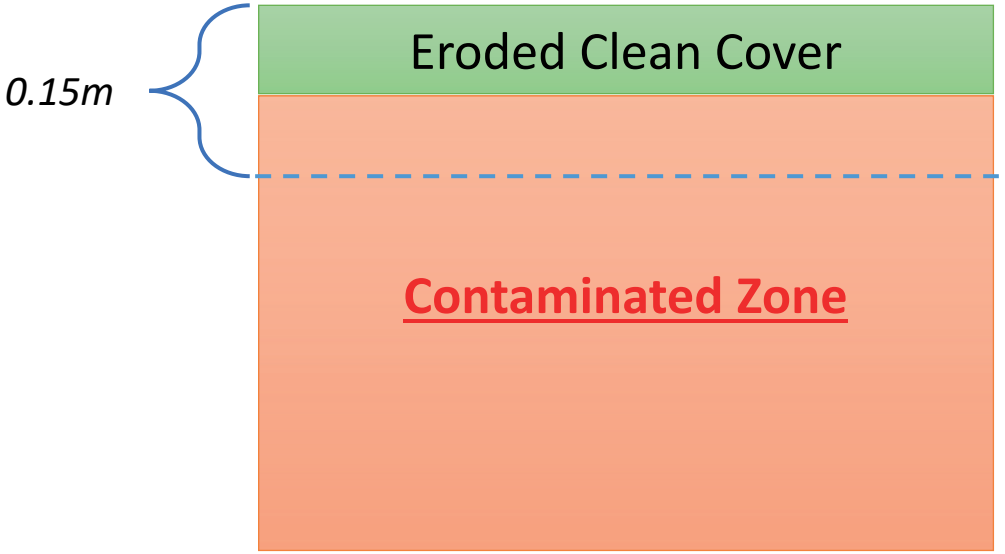
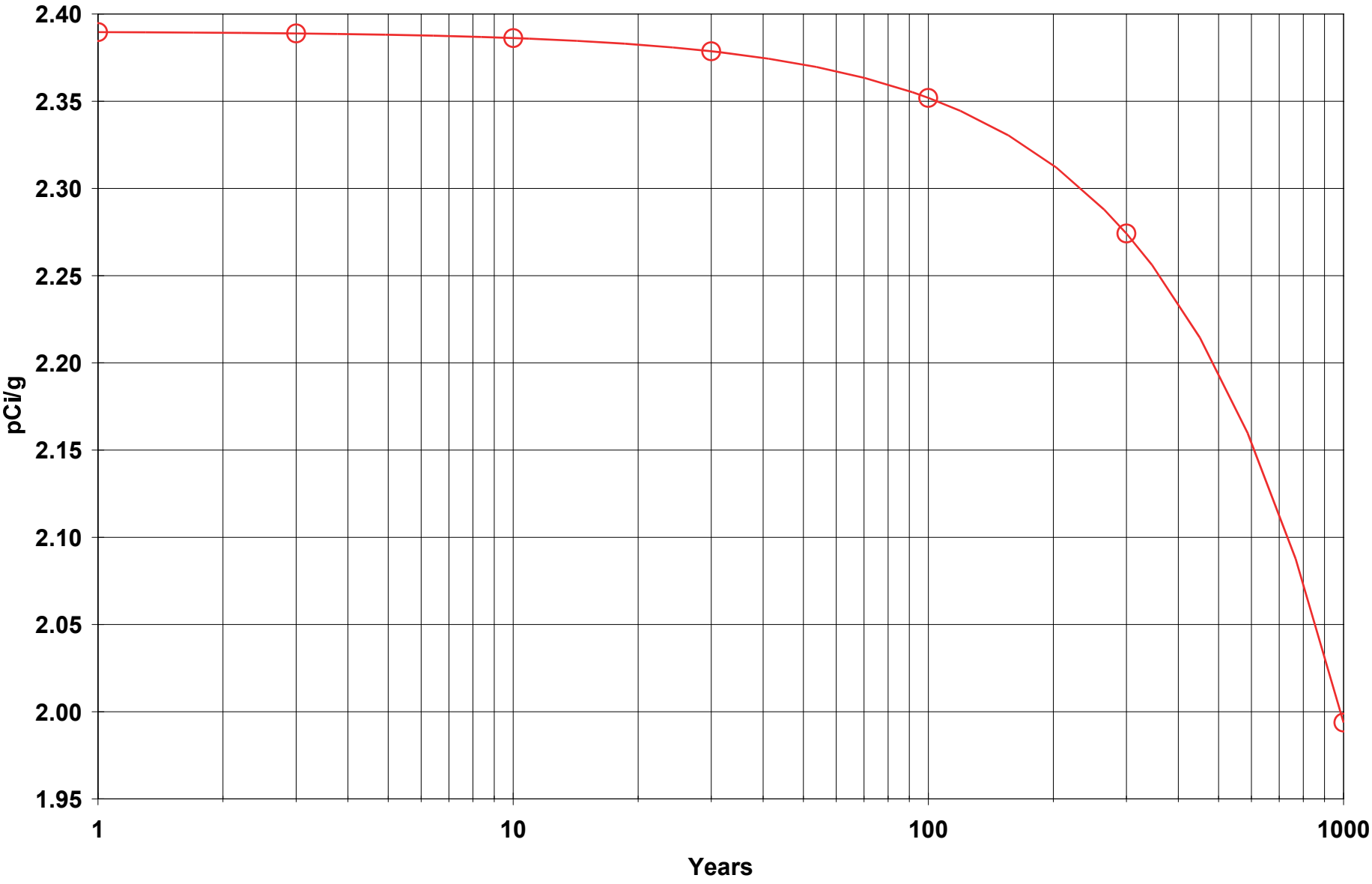
RESRAD Subsurface Source

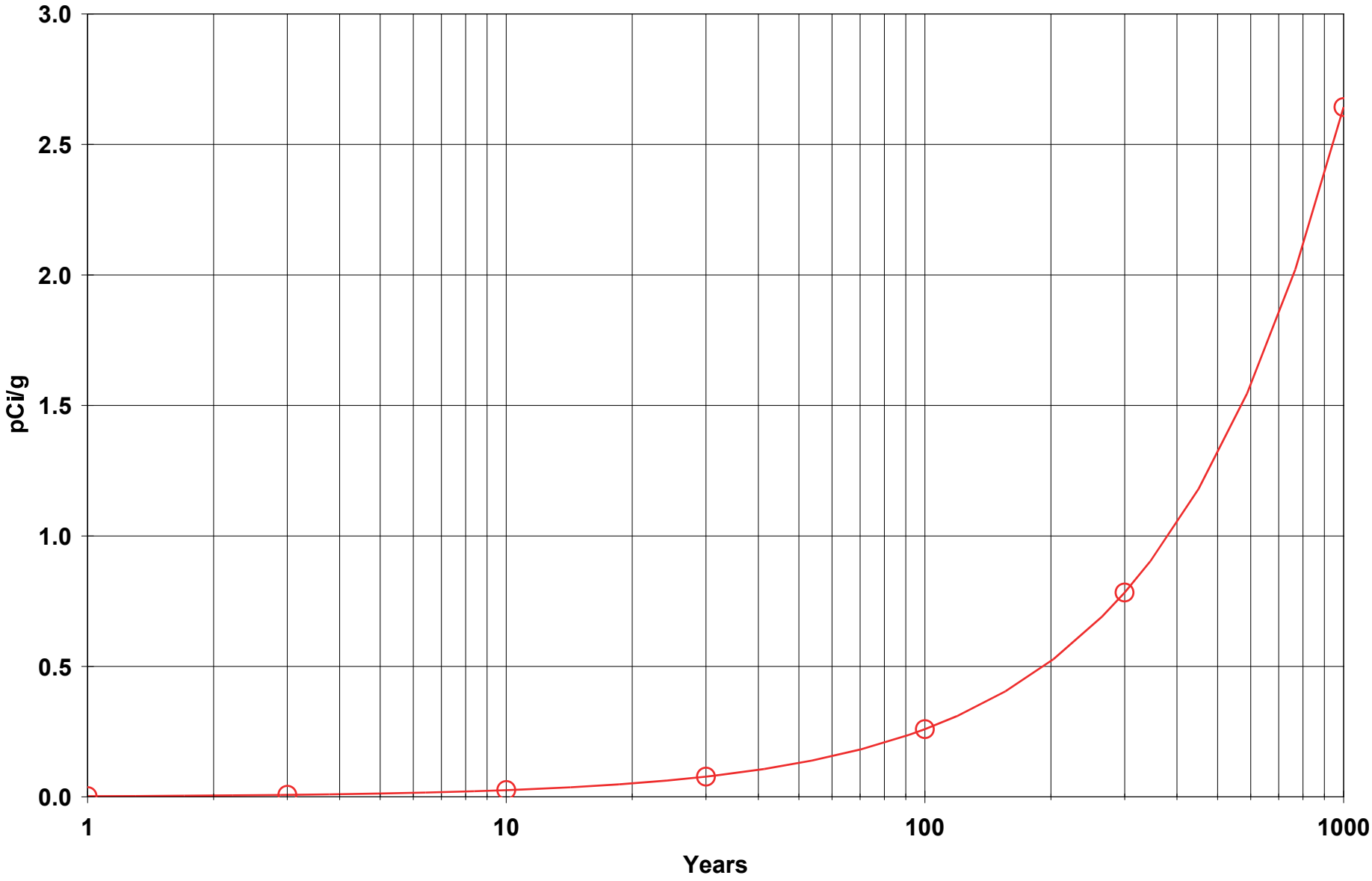


CONCENTRATION: Ra-226, Contaminated Zone Soil



C:\USERS\H5TDERJC\DESKTOP\NFSS\02 - VPH\13 - RISK ASSESSMENT\04 - RESRAD\IW SS SURFACE CONCENTRATION.RAD 02/05/2021 07:17 GRAPHICS.ASC

CONCENTRATION: Ra-226, Surface Soil



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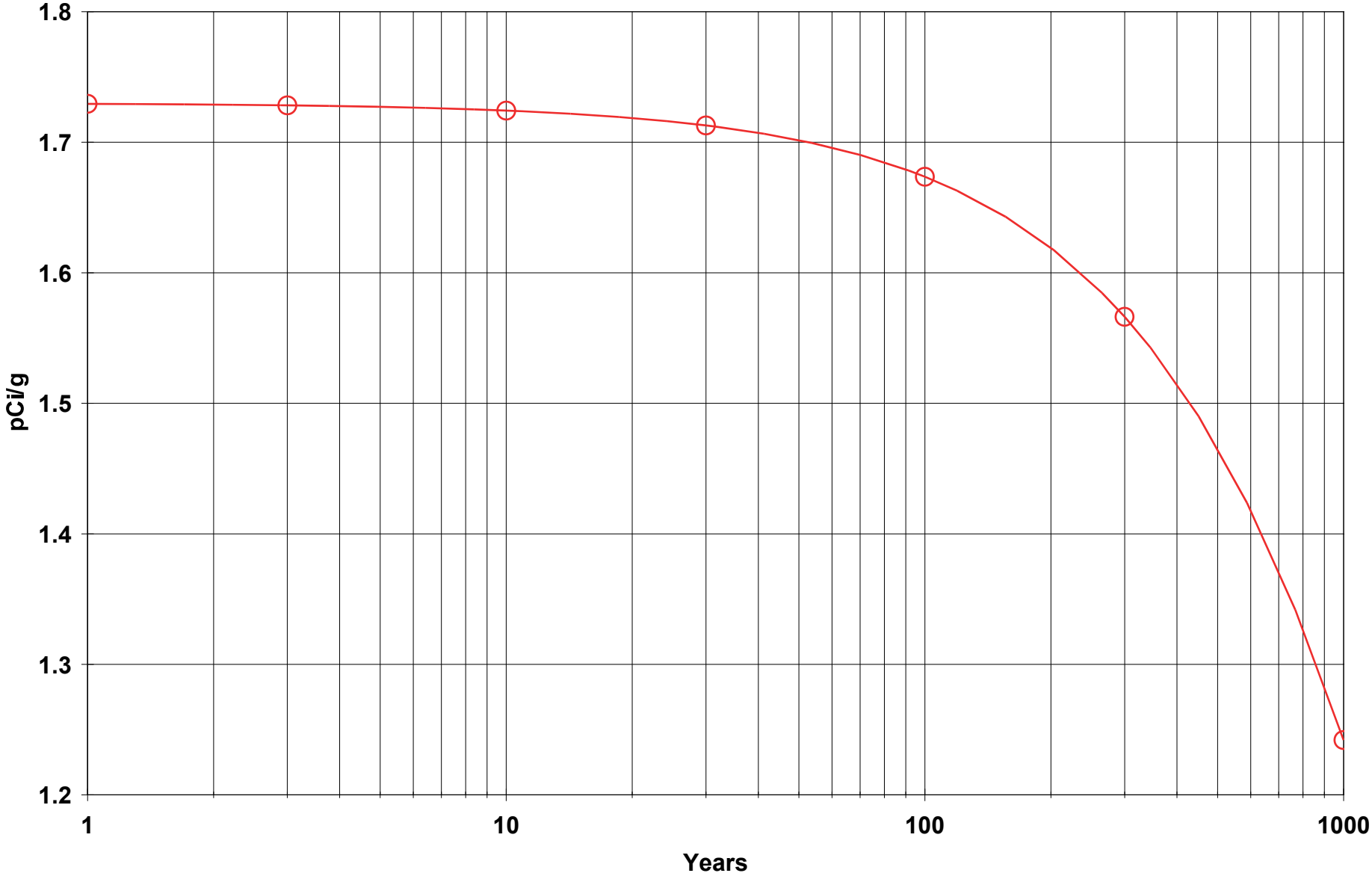
CONCENTRATION: Th-230, Contaminated Zone Soil



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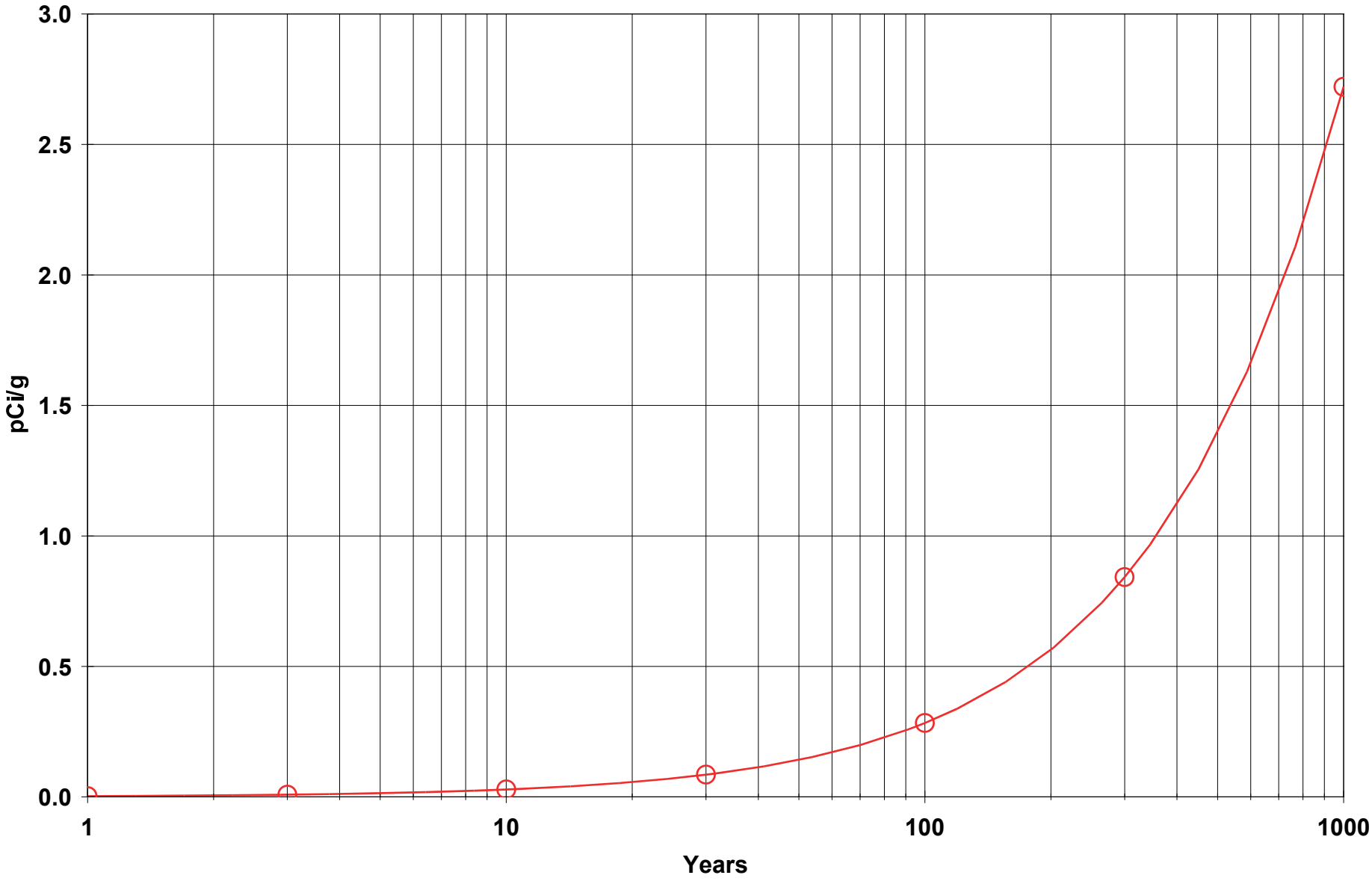
CONCENTRATION: Th-230, Surface Soil



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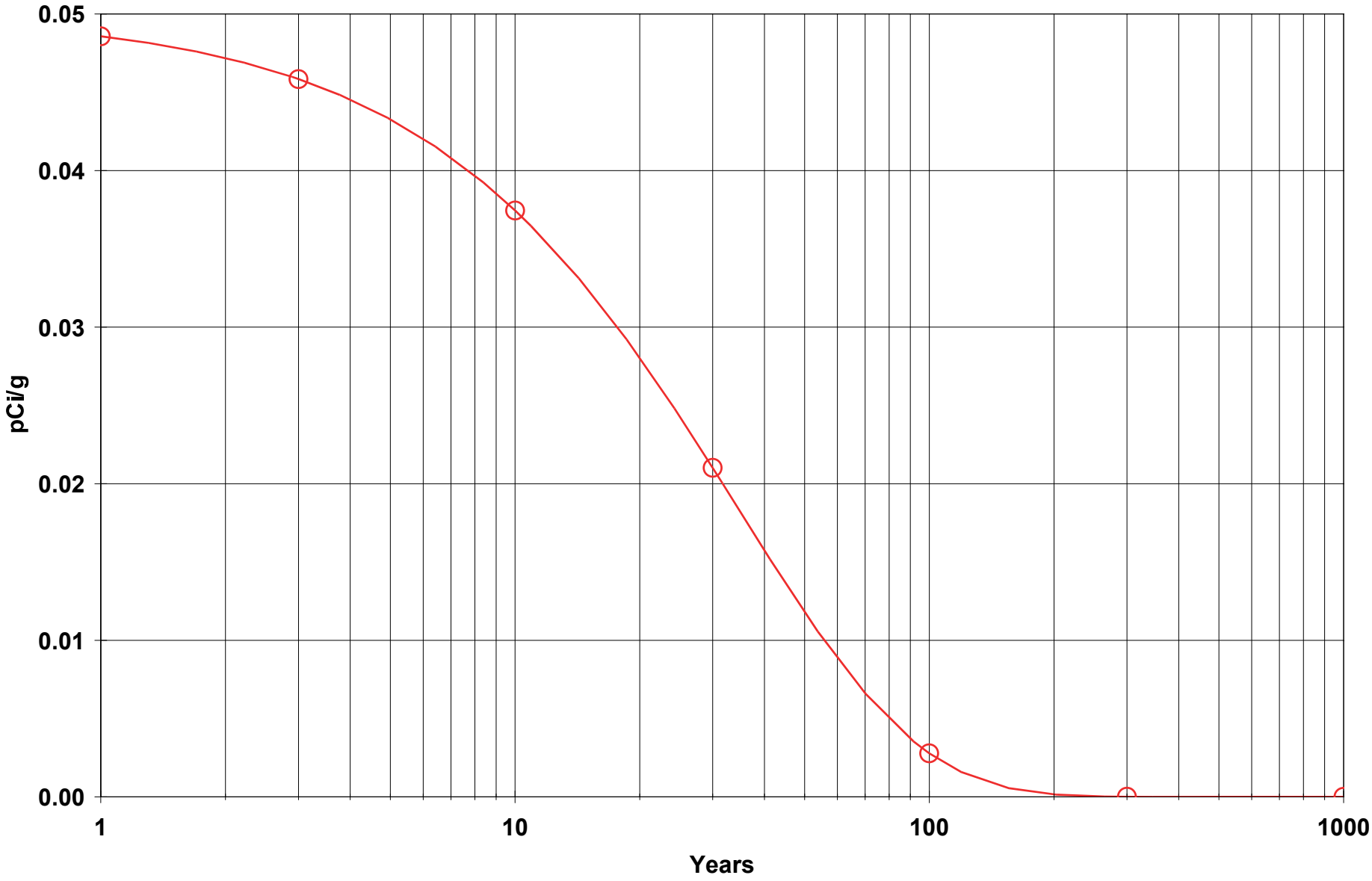
CONCENTRATION: U-238, Contaminated Zone Soil



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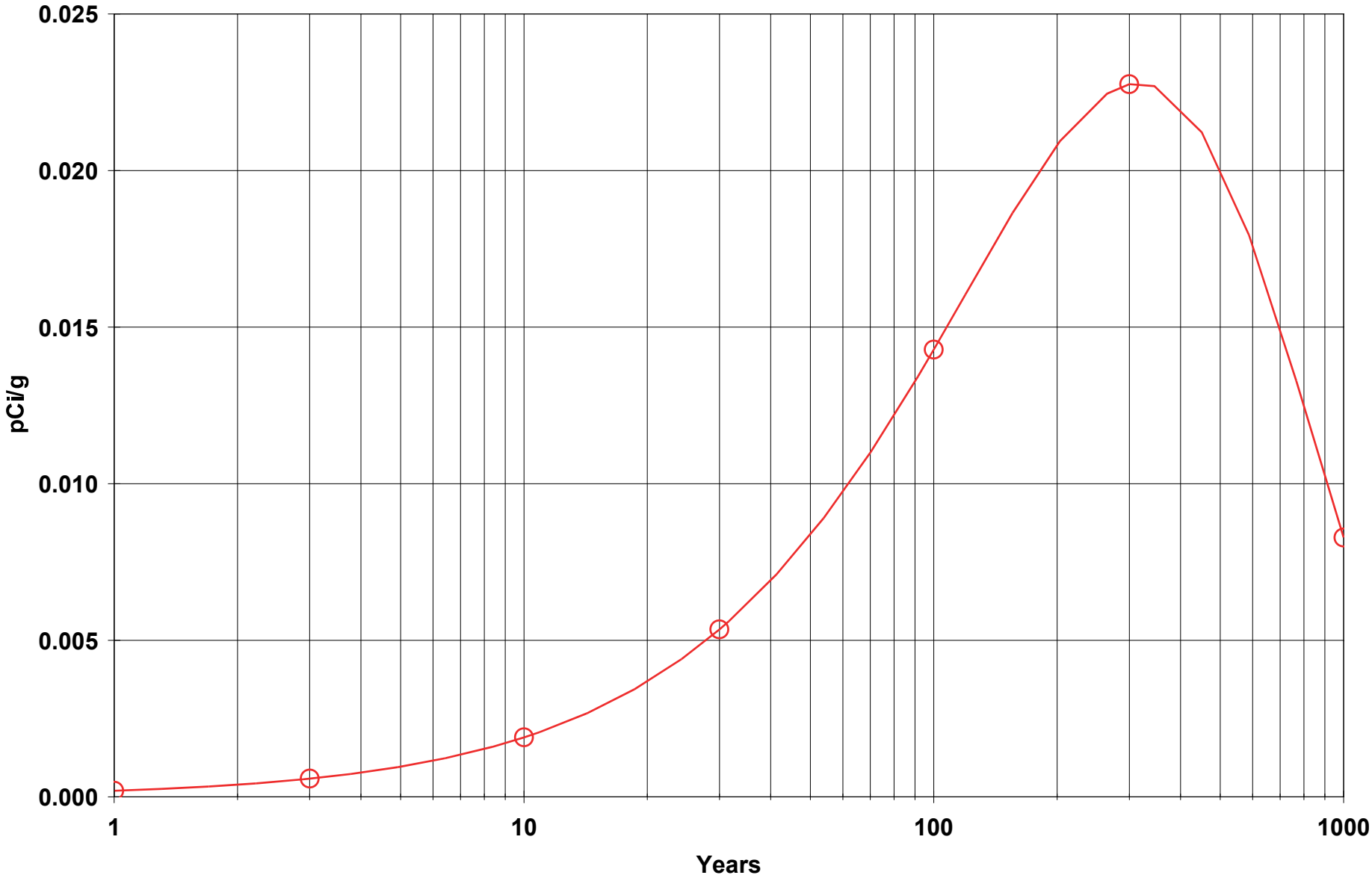
CONCENTRATION: U-238, Surface Soil



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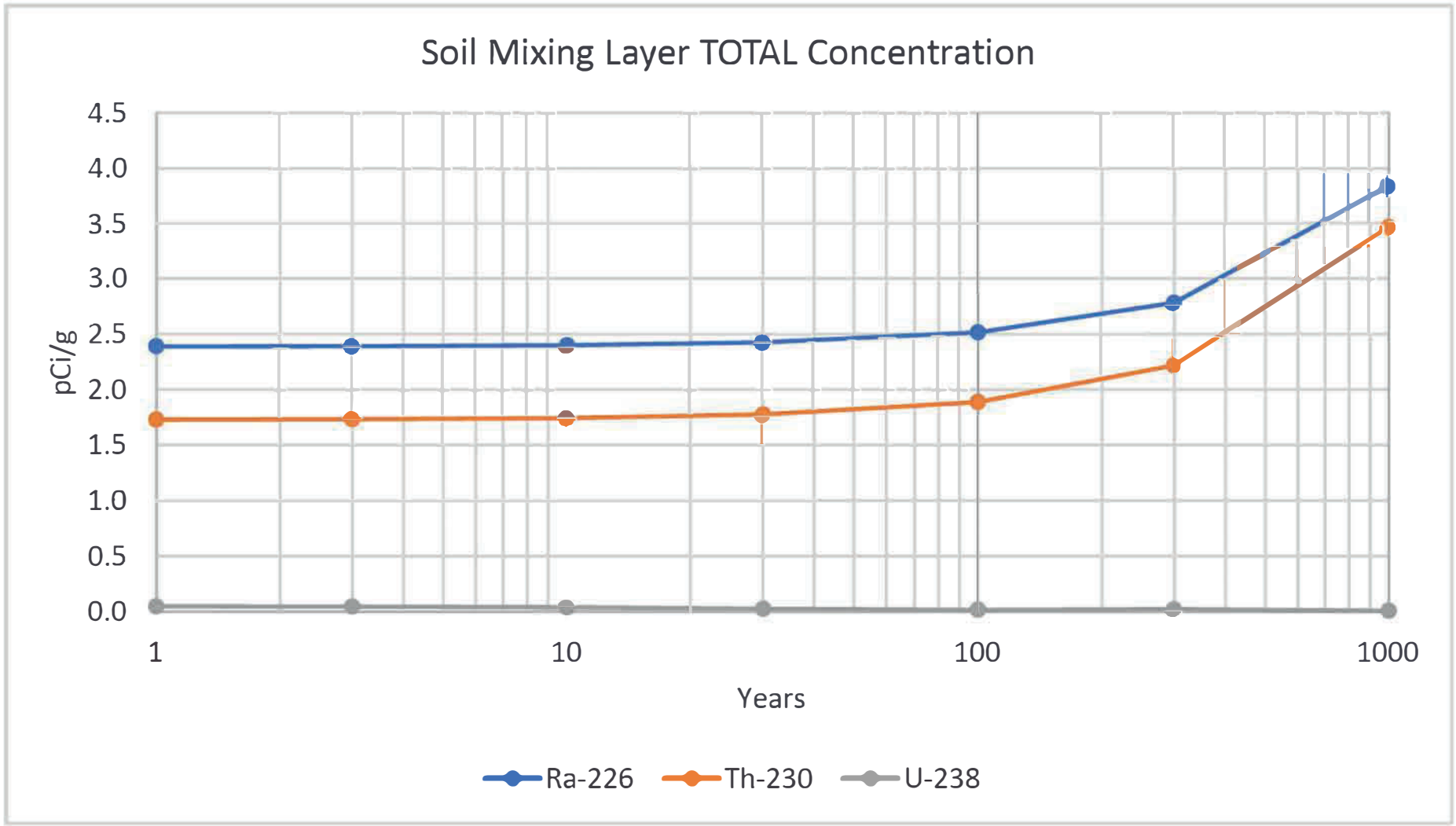
Soil Mixing Layer TOTAL Concentration
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
pCi/g
1
10
100
1000
Years
Ra-226
Th-230
U-238

Concent : NFSS VP H Prime Surface Soil (0-0.15m) Construction Worker
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Concent : NFSS VP H Prime Surface Soil (0-0.15m) Construction Worker
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Concentration of radionuclides in environmental media
at t = 0.000E+00 years

Radio-Nuclide	Contaminated Zone pCi/g	Surface Soil* pCi/g	Air Particulate pCi/m**3	Well Water pCi/L	Surface Water pCi/L
Ac-227	3.000E-03	3.000E-03	1.449E-07	0.000E+00	0.000E+00
Pa-231	3.000E-03	3.000E-03	1.449E-07	0.000E+00	0.000E+00
Pb-210	2.390E+00	2.390E+00	1.154E-04	0.000E+00	0.000E+00
Ra-226	2.390E+00	2.390E+00	1.154E-04	0.000E+00	0.000E+00
Th-230	1.730E+00	1.730E+00	8.354E-05	0.000E+00	0.000E+00
U-234	5.000E-02	5.000E-02	2.414E-06	0.000E+00	0.000E+00
U-235	3.000E-03	3.000E-03	1.449E-07	0.000E+00	0.000E+00
U-238	5.000E-02	5.000E-02	2.414E-06	0.000E+00	0.000E+00

*The Surface Soil is the top layer of soil within the user specified mixing zone/depth.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Concentration of radionuclides in foodstuff media
at t = 0.000E+00 years*

Radio-Nuclide	Drinking Water pCi/L	Nonleafy Vegetable pCi/kg	Leafy Vegetable pCi/kg	Fodder Meat pCi/kg	Fodder Milk pCi/kg	Meat pCi/kg	Milk pCi/L	Fish pCi/kg	Crustacea pCi/kg
Ac-227	0.000E+00	1.251E-03	1.256E-03	1.257E-03	1.257E-03	3.171E-05	3.138E-05	0.000E+00	0.000E+00
Pa-231	0.000E+00	5.001E-03	5.006E-03	5.007E-03	5.007E-03	9.202E-03	8.877E-06	0.000E+00	0.000E+00
Pb-210	0.000E+00	3.984E+00	3.988E+00	3.989E+00	3.989E+00	1.173E+00	4.243E-01	0.000E+00	0.000E+00
Ra-226	0.000E+00	1.593E+01	1.594E+01	1.594E+01	1.594E+01	2.279E+00	2.072E+00	0.000E+00	0.000E+00
Th-230	0.000E+00	2.891E-01	2.920E-01	2.923E-01	2.923E-01	8.849E-02	4.405E-03	0.000E+00	0.000E+00
U-234	0.000E+00	2.086E-02	2.094E-02	2.095E-02	2.095E-02	8.984E-03	1.569E-02	0.000E+00	0.000E+00
U-235	0.000E+00	1.251E-03	1.256E-03	1.257E-03	1.257E-03	5.391E-04	9.415E-04	0.000E+00	0.000E+00
U-238	0.000E+00	2.086E-02	2.094E-02	2.095E-02	2.095E-02	8.984E-03	1.569E-02	0.000E+00	0.000E+00

*Concentrations are at consumption time and include radioactive decay and ingrowth during storage time.
For livestock fodder, consumption time is t minus meat or milk storage time.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Concent : NFSS VP H Prime Surface Soil (0-0.15m) Construction Worker
File : C:\USERS\H5TDERJC\DESKTOP\NFSS\02 - VPH\13 - RISK ASSESSMENT\04 - RESRAD\SS CONC.RAD

Concentration of radionuclides in environmental media
at t = 1.000E+00 years

Radio-Nuclide	Contaminated Zone pCi/g	Surface Soil* pCi/g	Air Particulate pCi/m**3	Well Water pCi/L	Surface Water pCi/L
Ac-227	2.794E-03	2.793E-03	1.349E-07	0.000E+00	0.000E+00
Pa-231	2.915E-03	2.913E-03	1.407E-07	0.000E+00	0.000E+00
Pb-210	2.388E+00	2.387E+00	1.153E-04	0.000E+00	0.000E+00
Ra-226	2.390E+00	2.389E+00	1.153E-04	0.000E+00	0.000E+00
Th-230	1.729E+00	1.729E+00	8.348E-05	0.000E+00	0.000E+00
U-234	4.858E-02	4.856E-02	2.345E-06	0.000E+00	0.000E+00
U-235	2.915E-03	2.913E-03	1.407E-07	0.000E+00	0.000E+00
U-238	4.858E-02	4.856E-02	2.345E-06	0.000E+00	0.000E+00

*The Surface Soil is the top layer of soil within the user specified mixing zone/depth.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Concentration of radionuclides in foodstuff media
at t = 1.000E+00 years*

Radio-Nuclide	Drinking Water pCi/L	Nonleafy Vegetable pCi/kg	Leafy Vegetable pCi/kg	Fodder Meat pCi/kg	Fodder Milk pCi/kg	Meat pCi/kg	Milk pCi/L	Fish pCi/kg	Crustacea pCi/kg
Ac-227	0.000E+00	1.173E-03	1.170E-03	1.200E-03	1.195E-03	4.522E-05	2.925E-05	0.000E+00	0.000E+00
Pa-231	0.000E+00	4.862E-03	4.862E-03	4.888E-03	4.880E-03	8.957E-03	8.626E-06	0.000E+00	0.000E+00
Pb-210	0.000E+00	3.994E+00	3.985E+00	4.031E+00	4.031E+00	1.176E+00	4.248E-01	0.000E+00	0.000E+00
Ra-226	0.000E+00	1.593E+01	1.593E+01	1.593E+01	1.593E+01	2.278E+00	2.070E+00	0.000E+00	0.000E+00
Th-230	0.000E+00	2.889E-01	2.918E-01	2.921E-01	2.921E-01	8.843E-02	4.402E-03	0.000E+00	0.000E+00
U-234	0.000E+00	2.028E-02	2.034E-02	2.045E-02	2.042E-02	8.741E-03	1.524E-02	0.000E+00	0.000E+00
U-235	0.000E+00	1.217E-03	1.220E-03	1.227E-03	1.225E-03	5.244E-04	9.145E-04	0.000E+00	0.000E+00
U-238	0.000E+00	2.028E-02	2.034E-02	2.045E-02	2.042E-02	8.741E-03	1.524E-02	0.000E+00	0.000E+00

*Concentrations are at consumption time and include radioactive decay and ingrowth during storage time.
For livestock fodder, consumption time is t minus meat or milk storage time.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Concent : NFSS VP H Prime Surface Soil (0-0.15m) Construction Worker
File : C:\USERS\H5TDERJC\DESKTOP\NFSS\02 - VPH\13 - RISK ASSESSMENT\04 - RESRAD\SS CONC.RAD

Concentration of radionuclides in environmental media
at t = 3.000E+00 years

Radio-Nuclide	Contaminated Zone pCi/g	Surface Soil* pCi/g	Air Particulate pCi/m**3	Well Water pCi/L	Surface Water pCi/L
Ac-227	2.434E-03	2.431E-03	1.174E-07	0.000E+00	0.000E+00
Pa-231	2.751E-03	2.748E-03	1.327E-07	0.000E+00	0.000E+00
Pb-210	2.385E+00	2.382E+00	1.150E-04	0.000E+00	0.000E+00
Ra-226	2.389E+00	2.386E+00	1.152E-04	0.000E+00	0.000E+00
Th-230	1.728E+00	1.726E+00	8.336E-05	0.000E+00	0.000E+00
U-234	4.585E-02	4.579E-02	2.211E-06	0.000E+00	0.000E+00
U-235	2.751E-03	2.748E-03	1.327E-07	0.000E+00	0.000E+00
U-238	4.585E-02	4.579E-02	2.211E-06	0.000E+00	0.000E+00

*The Surface Soil is the top layer of soil within the user specified mixing zone/depth.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Concentration of radionuclides in foodstuff media
at t = 3.000E+00 years*

Radio-Nuclide	Drinking Water pCi/L	Nonleafy Vegetable pCi/kg	Leafy Vegetable pCi/kg	Fodder Meat pCi/kg	Fodder Milk pCi/kg	Meat pCi/kg	Milk pCi/L	Fish pCi/kg	Crustacea pCi/kg
Ac-227	0.000E+00	1.021E-03	1.018E-03	1.045E-03	1.041E-03	4.049E-05	2.546E-05	0.000E+00	0.000E+00
Pa-231	0.000E+00	4.586E-03	4.585E-03	4.610E-03	4.603E-03	8.447E-03	8.135E-06	0.000E+00	0.000E+00
Pb-210	0.000E+00	3.986E+00	3.977E+00	4.022E+00	4.022E+00	1.174E+00	4.239E-01	0.000E+00	0.000E+00
Ra-226	0.000E+00	1.591E+01	1.591E+01	1.591E+01	1.591E+01	2.275E+00	2.068E+00	0.000E+00	0.000E+00
Th-230	0.000E+00	2.885E-01	2.913E-01	2.917E-01	2.917E-01	8.830E-02	4.396E-03	0.000E+00	0.000E+00
U-234	0.000E+00	1.912E-02	1.918E-02	1.929E-02	1.926E-02	8.243E-03	1.437E-02	0.000E+00	0.000E+00
U-235	0.000E+00	1.147E-03	1.151E-03	1.157E-03	1.155E-03	4.946E-04	8.625E-04	0.000E+00	0.000E+00
U-238	0.000E+00	1.912E-02	1.918E-02	1.929E-02	1.926E-02	8.243E-03	1.437E-02	0.000E+00	0.000E+00

*Concentrations are at consumption time and include radioactive decay and ingrowth during storage time.
For livestock fodder, consumption time is t minus meat or milk storage time.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Concent : NFSS VP H Prime Surface Soil (0-0.15m) Construction Worker
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Concentration of radionuclides in environmental media
at t = 1.000E+01 years

Radio-Nuclide	Contaminated Zone pCi/g	Surface Soil* pCi/g	Air Particulate pCi/m**3	Well Water pCi/L	Surface Water pCi/L
Ac-227	1.568E-03	1.562E-03	7.543E-08	0.000E+00	0.000E+00
Pa-231	2.247E-03	2.238E-03	1.081E-07	0.000E+00	0.000E+00
Pb-210	2.375E+00	2.366E+00	1.142E-04	0.000E+00	0.000E+00
Ra-226	2.386E+00	2.377E+00	1.148E-04	0.000E+00	0.000E+00
Th-230	1.724E+00	1.717E+00	8.293E-05	0.000E+00	0.000E+00
U-234	3.745E-02	3.730E-02	1.801E-06	0.000E+00	0.000E+00
U-235	2.247E-03	2.238E-03	1.081E-07	0.000E+00	0.000E+00
U-238	3.745E-02	3.730E-02	1.801E-06	0.000E+00	0.000E+00

*The Surface Soil is the top layer of soil within the user specified mixing zone/depth.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Concentration of radionuclides in foodstuff media
at t = 1.000E+01 years*

Radio-Nuclide	Drinking Water pCi/L	Nonleafy Vegetable pCi/kg	Leafy Vegetable pCi/kg	Fodder Meat pCi/kg	Fodder Milk pCi/kg	Meat pCi/kg	Milk pCi/L	Fish pCi/kg	Crustacea pCi/kg
Ac-227	0.000E+00	6.567E-04	6.545E-04	6.734E-04	6.714E-04	2.854E-05	1.636E-05	0.000E+00	0.000E+00
Pa-231	0.000E+00	3.735E-03	3.735E-03	3.755E-03	3.749E-03	6.881E-03	6.627E-06	0.000E+00	0.000E+00
Pb-210	0.000E+00	3.958E+00	3.949E+00	3.995E+00	3.994E+00	1.166E+00	4.209E-01	0.000E+00	0.000E+00
Ra-226	0.000E+00	1.585E+01	1.585E+01	1.585E+01	1.585E+01	2.266E+00	2.060E+00	0.000E+00	0.000E+00
Th-230	0.000E+00	2.870E-01	2.898E-01	2.902E-01	2.902E-01	8.785E-02	4.373E-03	0.000E+00	0.000E+00
U-234	0.000E+00	1.558E-02	1.562E-02	1.571E-02	1.569E-02	6.715E-03	1.171E-02	0.000E+00	0.000E+00
U-235	0.000E+00	9.346E-04	9.373E-04	9.426E-04	9.412E-04	4.029E-04	7.025E-04	0.000E+00	0.000E+00
U-238	0.000E+00	1.558E-02	1.562E-02	1.571E-02	1.569E-02	6.715E-03	1.171E-02	0.000E+00	0.000E+00

*Concentrations are at consumption time and include radioactive decay and ingrowth during storage time.
For livestock fodder, consumption time is t minus meat or milk storage time.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Concent : NFSS VP H Prime Surface Soil (0-0.15m) Construction Worker
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Concentration of radionuclides in environmental media
at t = 3.000E+01 years

Radio-Nuclide	Contaminated Zone pCi/g	Surface Soil* pCi/g	Air Particulate pCi/m**3	Well Water pCi/L	Surface Water pCi/L
Ac-227	6.140E-04	6.066E-04	2.929E-08	0.000E+00	0.000E+00
Pa-231	1.261E-03	1.246E-03	6.015E-08	0.000E+00	0.000E+00
Pb-210	2.354E+00	2.326E+00	1.123E-04	0.000E+00	0.000E+00
Ra-226	2.379E+00	2.350E+00	1.135E-04	0.000E+00	0.000E+00
Th-230	1.713E+00	1.692E+00	8.172E-05	0.000E+00	0.000E+00
U-234	2.101E-02	2.076E-02	1.002E-06	0.000E+00	0.000E+00
U-235	1.261E-03	1.246E-03	6.015E-08	0.000E+00	0.000E+00
U-238	2.101E-02	2.076E-02	1.002E-06	0.000E+00	0.000E+00

*The Surface Soil is the top layer of soil within the user specified mixing zone/depth.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Concentration of radionuclides in foodstuff media
at t = 3.000E+01 years*

Radio-Nuclide	Drinking Water pCi/L	Nonleafy Vegetable pCi/kg	Leafy Vegetable pCi/kg	Fodder Meat pCi/kg	Fodder Milk pCi/kg	Meat pCi/kg	Milk pCi/L	Fish pCi/kg	Crustacea pCi/kg
Ac-227	0.000E+00	2.556E-04	2.542E-04	2.631E-04	2.626E-04	1.310E-05	6.356E-06	0.000E+00	0.000E+00
Pa-231	0.000E+00	2.079E-03	2.079E-03	2.090E-03	2.087E-03	3.830E-03	3.688E-06	0.000E+00	0.000E+00
Pb-210	0.000E+00	3.892E+00	3.882E+00	3.927E+00	3.927E+00	1.146E+00	4.138E-01	0.000E+00	0.000E+00
Ra-226	0.000E+00	1.567E+01	1.567E+01	1.567E+01	1.567E+01	2.241E+00	2.037E+00	0.000E+00	0.000E+00
Th-230	0.000E+00	2.828E-01	2.856E-01	2.860E-01	2.860E-01	8.657E-02	4.310E-03	0.000E+00	0.000E+00
U-234	0.000E+00	8.669E-03	8.694E-03	8.743E-03	8.730E-03	3.737E-03	6.517E-03	0.000E+00	0.000E+00
U-235	0.000E+00	5.201E-04	5.217E-04	5.246E-04	5.238E-04	2.242E-04	3.910E-04	0.000E+00	0.000E+00
U-238	0.000E+00	8.669E-03	8.694E-03	8.743E-03	8.730E-03	3.737E-03	6.517E-03	0.000E+00	0.000E+00

*Concentrations are at consumption time and include radioactive decay and ingrowth during storage time.
For livestock fodder, consumption time is t minus meat or milk storage time.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Concent : NFSS VP H Prime Surface Soil (0-0.15m) Construction Worker
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Concentration of radionuclides in environmental media
at t = 1.000E+02 years

Radio-Nuclide	Contaminated Zone pCi/g	Surface Soil* pCi/g	Air Particulate pCi/m**3	Well Water pCi/L	Surface Water pCi/L
Ac-227	7.110E-05	6.826E-05	3.296E-09	0.000E+00	0.000E+00
Pa-231	1.668E-04	1.601E-04	7.731E-09	0.000E+00	0.000E+00
Pb-210	2.314E+00	2.222E+00	1.073E-04	0.000E+00	0.000E+00
Ra-226	2.352E+00	2.258E+00	1.090E-04	0.000E+00	0.000E+00
Th-230	1.674E+00	1.607E+00	7.759E-05	0.000E+00	0.000E+00
U-234	2.780E-03	2.668E-03	1.289E-07	0.000E+00	0.000E+00
U-235	1.668E-04	1.601E-04	7.731E-09	0.000E+00	0.000E+00
U-238	2.780E-03	2.668E-03	1.289E-07	0.000E+00	0.000E+00

*The Surface Soil is the top layer of soil within the user specified mixing zone/depth.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Concentration of radionuclides in foodstuff media
at t = 1.000E+02 years*

Radio-Nuclide	Drinking Water pCi/L	Nonleafy Vegetable pCi/kg	Leafy Vegetable pCi/kg	Fodder Meat pCi/kg	Fodder Milk pCi/kg	Meat pCi/kg	Milk pCi/L	Fish pCi/kg	Crustacea pCi/kg
Ac-227	0.000E+00	2.879E-05	2.861E-05	2.969E-05	2.964E-05	1.580E-06	7.152E-07	0.000E+00	0.000E+00
Pa-231	0.000E+00	2.672E-04	2.672E-04	2.686E-04	2.682E-04	4.922E-04	4.740E-07	0.000E+00	0.000E+00
Pb-210	0.000E+00	3.717E+00	3.708E+00	3.752E+00	3.752E+00	1.095E+00	3.953E-01	0.000E+00	0.000E+00
Ra-226	0.000E+00	1.505E+01	1.506E+01	1.506E+01	1.506E+01	2.153E+00	1.957E+00	0.000E+00	0.000E+00
Th-230	0.000E+00	2.685E-01	2.712E-01	2.715E-01	2.715E-01	8.218E-02	4.091E-03	0.000E+00	0.000E+00
U-234	0.000E+00	1.114E-03	1.118E-03	1.124E-03	1.122E-03	4.803E-04	8.376E-04	0.000E+00	0.000E+00
U-235	0.000E+00	6.686E-05	6.705E-05	6.743E-05	6.733E-05	2.882E-05	5.026E-05	0.000E+00	0.000E+00
U-238	0.000E+00	1.114E-03	1.118E-03	1.124E-03	1.122E-03	4.803E-04	8.376E-04	0.000E+00	0.000E+00

*Concentrations are at consumption time and include radioactive decay and ingrowth during storage time.
For livestock fodder, consumption time is t minus meat or milk storage time.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Concent : NFSS VP H Prime Surface Soil (0-0.15m) Construction Worker
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Concentration of radionuclides in environmental media
at t = 3.000E+02 years

Radio-Nuclide	Contaminated Zone pCi/g	Surface Soil* pCi/g	Air Particulate pCi/m**3	Well Water pCi/L	Surface Water pCi/L
Ac-227	2.196E-07	1.932E-07	9.331E-12	1.506E-04	2.439E-06
Pa-231	5.154E-07	4.536E-07	2.190E-11	0.000E+00	0.000E+00
Pb-210	2.237E+00	1.968E+00	9.505E-05	0.000E+00	0.000E+00
Ra-226	2.274E+00	2.001E+00	9.664E-05	0.000E+00	0.000E+00
Th-230	1.566E+00	1.378E+00	6.656E-05	0.000E+00	0.000E+00
U-234	8.590E-06	7.559E-06	3.650E-10	0.000E+00	0.000E+00
U-235	5.154E-07	4.536E-07	2.190E-11	0.000E+00	0.000E+00
U-238	8.590E-06	7.559E-06	3.650E-10	0.000E+00	0.000E+00

*The Surface Soil is the top layer of soil within the user specified mixing zone/depth.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Concentration of radionuclides in foodstuff media
at t = 3.000E+02 years*

Radio-Nuclide	Drinking Water pCi/L	Nonleafy Vegetable pCi/kg	Leafy Vegetable pCi/kg	Fodder Meat pCi/kg	Fodder Milk pCi/kg	Meat pCi/kg	Milk pCi/L	Fish pCi/kg	Crustacea pCi/kg
Ac-227	1.506E-04	5.200E-05	2.494E-04	2.711E-04	2.714E-04	5.225E-07	7.822E-07	3.655E-05	2.437E-03
Pa-231	0.000E+00	7.570E-07	7.569E-07	7.609E-07	7.598E-07	1.394E-06	1.343E-09	0.000E+00	0.000E+00
Pb-210	0.000E+00	3.294E+00	3.286E+00	3.324E+00	3.324E+00	9.698E-01	3.502E-01	0.000E+00	0.000E+00
Ra-226	0.000E+00	1.334E+01	1.335E+01	1.335E+01	1.335E+01	1.908E+00	1.735E+00	0.000E+00	0.000E+00
Th-230	0.000E+00	2.303E-01	2.326E-01	2.329E-01	2.329E-01	7.050E-02	3.510E-03	0.000E+00	0.000E+00
U-234	0.000E+00	3.157E-06	3.166E-06	3.184E-06	3.179E-06	1.361E-06	2.373E-06	0.000E+00	0.000E+00
U-235	0.000E+00	1.894E-07	1.900E-07	1.910E-07	1.907E-07	8.165E-08	1.424E-07	0.000E+00	0.000E+00
U-238	0.000E+00	3.157E-06	3.166E-06	3.184E-06	3.179E-06	1.361E-06	2.373E-06	0.000E+00	0.000E+00

*Concentrations are at consumption time and include radioactive decay and ingrowth during storage time.
For livestock fodder, consumption time is t minus meat or milk storage time.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Concent : NFSS VP H Prime Surface Soil (0-0.15m) Construction Worker
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Concentration of radionuclides in environmental media
at t = 1.000E+03 years

Radio-Nuclide	Contaminated Zone pCi/g	Surface Soil* pCi/g	Air Particulate pCi/m**3	Well Water pCi/L	Surface Water pCi/L
Ac-227	3.603E-16	2.162E-16	1.044E-20	4.994E-03	8.090E-05
Pa-231	8.457E-16	5.074E-16	2.450E-20	2.002E-03	3.243E-05
Pb-210	1.963E+00	1.178E+00	5.687E-05	2.714E-07	4.396E-09
Ra-226	1.994E+00	1.196E+00	5.777E-05	1.712E-08	2.773E-10
Th-230	1.242E+00	7.452E-01	3.598E-05	1.547E-06	2.506E-08
U-234	1.410E-14	8.457E-15	4.084E-19	3.336E-02	5.405E-04
U-235	8.457E-16	5.074E-16	2.450E-20	2.002E-03	3.243E-05
U-238	1.410E-14	8.457E-15	4.084E-19	3.336E-02	5.405E-04

*The Surface Soil is the top layer of soil within the user specified mixing zone/depth.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Concentration of radionuclides in foodstuff media
at t = 1.000E+03 years*

Radio-Nuclide	Drinking Water pCi/L	Nonleafy Vegetable pCi/kg	Leafy Vegetable pCi/kg	Fodder Meat pCi/kg	Fodder Milk pCi/kg	Meat pCi/kg	Milk pCi/L	Fish pCi/kg	Crustacea pCi/kg
Ac-227	4.993E-03	1.724E-03	8.268E-03	9.037E-03	9.037E-03	2.028E-05	2.592E-05	1.213E-03	8.085E-02
Pa-231	2.002E-03	6.933E-04	3.317E-03	3.632E-03	3.632E-03	1.735E-03	2.600E-06	3.243E-04	3.567E-03
Pb-210	2.713E-07	1.971E+00	1.966E+00	1.989E+00	1.989E+00	5.802E-01	2.095E-01	1.318E-06	4.394E-07
Ra-226	1.712E-08	7.976E+00	7.978E+00	7.979E+00	7.978E+00	1.141E+00	1.037E+00	1.389E-08	6.943E-08
Th-230	1.548E-06	1.245E-01	1.258E-01	1.259E-01	1.259E-01	3.812E-02	1.898E-03	2.507E-06	1.254E-05
U-234	3.336E-02	1.153E-02	5.524E-02	6.052E-02	6.052E-02	1.966E-03	5.200E-03	5.405E-03	3.243E-02
U-235	2.002E-03	6.916E-04	3.315E-03	3.631E-03	3.631E-03	1.180E-04	3.120E-04	3.243E-04	1.946E-03
U-238	3.336E-02	1.153E-02	5.524E-02	6.052E-02	6.052E-02	1.966E-03	5.200E-03	5.405E-03	3.243E-02

*Concentrations are at consumption time and include radioactive decay and ingrowth during storage time.
For livestock fodder, consumption time is t minus meat or milk storage time.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Concent : NFSS VP H Prime Subsurface Soil (>0.15m) Construction Worker
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Concentration of radionuclides in environmental media
at t = 0.000E+00 years

Radio-Nuclide	Contaminated Zone pCi/g	Surface Soil* pCi/g	Air Particulate pCi/m**3	Well Water pCi/L	Surface Water pCi/L
Ac-227	2.000E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pa-231	2.000E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pb-210	6.460E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	6.460E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	7.110E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	5.500E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	2.000E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	4.900E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00

*The Surface Soil is the top layer of soil within the user specified mixing zone/depth.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Concentration of radionuclides in foodstuff media
at t = 0.000E+00 years*

Radio-Nuclide	Drinking Water pCi/L	Nonleafy Vegetable pCi/kg	Leafy Vegetable pCi/kg	Fodder Meat pCi/kg	Fodder Milk pCi/kg	Meat pCi/kg	Milk pCi/L	Fish pCi/kg	Crustacea pCi/kg
Ac-227	0.000E+00	4.167E-02	4.167E-02	4.167E-02	4.167E-02	5.667E-05	4.583E-05	0.000E+00	0.000E+00
Pa-231	0.000E+00	1.667E-01	1.667E-01	1.667E-01	1.667E-01	5.667E-02	4.583E-05	0.000E+00	0.000E+00
Pb-210	0.000E+00	5.383E+01	5.383E+01	5.383E+01	5.383E+01	2.929E+00	8.882E-01	0.000E+00	0.000E+00
Ra-226	0.000E+00	2.153E+02	2.153E+02	2.153E+02	2.153E+02	1.464E+01	1.184E+01	0.000E+00	0.000E+00
Th-230	0.000E+00	5.925E+00	5.925E+00	5.925E+00	5.925E+00	4.029E-02	1.629E-03	0.000E+00	0.000E+00
U-234	0.000E+00	1.146E+00	1.146E+00	1.146E+00	1.146E+00	2.649E-02	3.781E-02	0.000E+00	0.000E+00
U-235	0.000E+00	4.167E-02	4.167E-02	4.167E-02	4.167E-02	9.633E-04	1.375E-03	0.000E+00	0.000E+00
U-238	0.000E+00	1.021E+00	1.021E+00	1.021E+00	1.021E+00	2.360E-02	3.369E-02	0.000E+00	0.000E+00

*Concentrations are at consumption time and include radioactive decay and ingrowth during storage time.
For livestock fodder, consumption time is t minus meat or milk storage time.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Concent : NFSS VP H Prime Subsurface Soil (>0.15m) Construction Worker
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Concentration of radionuclides in environmental media
at t = 1.000E+00 years

Radio-Nuclide	Contaminated Zone pCi/g	Surface Soil* pCi/g	Air Particulate pCi/m**3	Well Water pCi/L	Surface Water pCi/L
Ac-227	1.984E-02	7.939E-06	3.834E-10	0.000E+00	0.000E+00
Pa-231	1.994E-02	7.976E-06	3.851E-10	0.000E+00	0.000E+00
Pb-210	6.460E+00	2.584E-03	1.248E-07	0.000E+00	0.000E+00
Ra-226	6.460E+00	2.584E-03	1.248E-07	0.000E+00	0.000E+00
Th-230	7.110E+00	2.844E-03	1.373E-07	0.000E+00	0.000E+00
U-234	5.483E-01	2.193E-04	1.059E-08	0.000E+00	0.000E+00
U-235	1.994E-02	7.976E-06	3.851E-10	0.000E+00	0.000E+00
U-238	4.885E-01	1.954E-04	9.436E-09	0.000E+00	0.000E+00

*The Surface Soil is the top layer of soil within the user specified mixing zone/depth.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Concentration of radionuclides in foodstuff media
at t = 1.000E+00 years*

Radio-Nuclide	Drinking Water pCi/L	Nonleafy Vegetable pCi/kg	Leafy Vegetable pCi/kg	Fodder Meat pCi/kg	Fodder Milk pCi/kg	Meat pCi/kg	Milk pCi/L	Fish pCi/kg	Crustacea pCi/kg
Ac-227	0.000E+00	4.151E-02	4.136E-02	4.189E-02	4.188E-02	1.554E-04	4.614E-05	0.000E+00	0.000E+00
Pa-231	0.000E+00	1.662E-01	1.662E-01	1.662E-01	1.662E-01	5.654E-02	4.573E-05	0.000E+00	0.000E+00
Pb-210	0.000E+00	5.403E+01	5.385E+01	5.445E+01	5.445E+01	2.983E+00	8.998E-01	0.000E+00	0.000E+00
Ra-226	0.000E+00	2.154E+02	2.154E+02	2.153E+02	2.153E+02	1.464E+01	1.185E+01	0.000E+00	0.000E+00
Th-230	0.000E+00	5.925E+00	5.925E+00	5.925E+00	5.925E+00	4.043E-02	1.637E-03	0.000E+00	0.000E+00
U-234	0.000E+00	1.142E+00	1.142E+00	1.143E+00	1.143E+00	2.646E-02	3.778E-02	0.000E+00	0.000E+00
U-235	0.000E+00	4.154E-02	4.154E-02	4.156E-02	4.155E-02	9.622E-04	1.374E-03	0.000E+00	0.000E+00
U-238	0.000E+00	1.018E+00	1.018E+00	1.018E+00	1.018E+00	2.357E-02	3.366E-02	0.000E+00	0.000E+00

*Concentrations are at consumption time and include radioactive decay and ingrowth during storage time.
For livestock fodder, consumption time is t minus meat or milk storage time.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Concent : NFSS VP H Prime Subsurface Soil (>0.15m) Construction Worker
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Concentration of radionuclides in environmental media
at t = 3.000E+00 years

Radio-Nuclide	Contaminated Zone pCi/g	Surface Soil* pCi/g	Air Particulate pCi/m**3	Well Water pCi/L	Surface Water pCi/L
Ac-227	1.955E-02	2.346E-05	1.133E-09	0.000E+00	0.000E+00
Pa-231	1.981E-02	2.377E-05	1.148E-09	0.000E+00	0.000E+00
Pb-210	6.459E+00	7.751E-03	3.743E-07	0.000E+00	0.000E+00
Ra-226	6.461E+00	7.753E-03	3.744E-07	0.000E+00	0.000E+00
Th-230	7.109E+00	8.531E-03	4.120E-07	0.000E+00	0.000E+00
U-234	5.448E-01	6.538E-04	3.157E-08	0.000E+00	0.000E+00
U-235	1.981E-02	2.377E-05	1.148E-09	0.000E+00	0.000E+00
U-238	4.854E-01	5.825E-04	2.813E-08	0.000E+00	0.000E+00

*The Surface Soil is the top layer of soil within the user specified mixing zone/depth.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Concentration of radionuclides in foodstuff media
at t = 3.000E+00 years*

Radio-Nuclide	Drinking Water pCi/L	Nonleafy Vegetable pCi/kg	Leafy Vegetable pCi/kg	Fodder Meat pCi/kg	Fodder Milk pCi/kg	Meat pCi/kg	Milk pCi/L	Fish pCi/kg	Crustacea pCi/kg
Ac-227	0.000E+00	4.090E-02	4.074E-02	4.127E-02	4.126E-02	1.542E-04	4.562E-05	0.000E+00	0.000E+00
Pa-231	0.000E+00	1.652E-01	1.651E-01	1.652E-01	1.652E-01	5.623E-02	4.549E-05	0.000E+00	0.000E+00
Pb-210	0.000E+00	5.403E+01	5.385E+01	5.445E+01	5.445E+01	2.985E+00	9.006E-01	0.000E+00	0.000E+00
Ra-226	0.000E+00	2.154E+02	2.154E+02	2.154E+02	2.154E+02	1.465E+01	1.185E+01	0.000E+00	0.000E+00
Th-230	0.000E+00	5.926E+00	5.926E+00	5.926E+00	5.926E+00	4.071E-02	1.651E-03	0.000E+00	0.000E+00
U-234	0.000E+00	1.135E+00	1.135E+00	1.136E+00	1.136E+00	2.637E-02	3.767E-02	0.000E+00	0.000E+00
U-235	0.000E+00	4.129E-02	4.128E-02	4.131E-02	4.130E-02	9.590E-04	1.370E-03	0.000E+00	0.000E+00
U-238	0.000E+00	1.012E+00	1.011E+00	1.012E+00	1.012E+00	2.349E-02	3.356E-02	0.000E+00	0.000E+00

*Concentrations are at consumption time and include radioactive decay and ingrowth during storage time.
For livestock fodder, consumption time is t minus meat or milk storage time.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Concentration of radionuclides in environmental media
at t = 1.000E+01 years

Radio-Nuclide	Contaminated Zone pCi/g	Surface Soil* pCi/g	Air Particulate pCi/m**3	Well Water pCi/L	Surface Water pCi/L
Ac-227	1.861E-02	7.446E-05	3.596E-09	0.000E+00	0.000E+00
Pa-231	1.938E-02	7.751E-05	3.743E-09	0.000E+00	0.000E+00
Pb-210	6.456E+00	2.582E-02	1.247E-06	0.000E+00	0.000E+00
Ra-226	6.463E+00	2.585E-02	1.248E-06	0.000E+00	0.000E+00
Th-230	7.107E+00	2.843E-02	1.373E-06	0.000E+00	0.000E+00
U-234	5.329E-01	2.131E-03	1.029E-07	0.000E+00	0.000E+00
U-235	1.938E-02	7.751E-05	3.743E-09	0.000E+00	0.000E+00
U-238	4.747E-01	1.899E-03	9.170E-08	0.000E+00	0.000E+00

*The Surface Soil is the top layer of soil within the user specified mixing zone/depth.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Concentration of radionuclides in foodstuff media
at t = 1.000E+01 years*

Radio-Nuclide	Drinking Water pCi/L	Nonleafy Vegetable pCi/kg	Leafy Vegetable pCi/kg	Fodder Meat pCi/kg	Fodder Milk pCi/kg	Meat pCi/kg	Milk pCi/L	Fish pCi/kg	Crustacea pCi/kg
Ac-227	0.000E+00	3.897E-02	3.882E-02	3.934E-02	3.932E-02	1.502E-04	4.400E-05	0.000E+00	0.000E+00
Pa-231	0.000E+00	1.616E-01	1.616E-01	1.617E-01	1.617E-01	5.517E-02	4.465E-05	0.000E+00	0.000E+00
Pb-210	0.000E+00	5.404E+01	5.386E+01	5.446E+01	5.446E+01	2.993E+00	9.034E-01	0.000E+00	0.000E+00
Ra-226	0.000E+00	2.156E+02	2.156E+02	2.156E+02	2.156E+02	1.467E+01	1.187E+01	0.000E+00	0.000E+00
Th-230	0.000E+00	5.927E+00	5.927E+00	5.927E+00	5.927E+00	4.172E-02	1.701E-03	0.000E+00	0.000E+00
U-234	0.000E+00	1.111E+00	1.111E+00	1.112E+00	1.111E+00	2.606E-02	3.732E-02	0.000E+00	0.000E+00
U-235	0.000E+00	4.041E-02	4.040E-02	4.042E-02	4.042E-02	9.477E-04	1.357E-03	0.000E+00	0.000E+00
U-238	0.000E+00	9.899E-01	9.898E-01	9.904E-01	9.902E-01	2.322E-02	3.325E-02	0.000E+00	0.000E+00

*Concentrations are at consumption time and include radioactive decay and ingrowth during storage time.
For livestock fodder, consumption time is t minus meat or milk storage time.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Concentration of radionuclides in environmental media
at t = 3.000E+01 years

Radio-Nuclide	Contaminated Zone pCi/g	Surface Soil* pCi/g	Air Particulate pCi/m**3	Well Water pCi/L	Surface Water pCi/L
Ac-227	1.663E-02	1.996E-04	9.638E-09	0.000E+00	0.000E+00
Pa-231	1.819E-02	2.183E-04	1.054E-08	0.000E+00	0.000E+00
Pb-210	6.453E+00	7.744E-02	3.739E-06	0.000E+00	0.000E+00
Ra-226	6.468E+00	7.761E-02	3.748E-06	0.000E+00	0.000E+00
Th-230	7.101E+00	8.521E-02	4.115E-06	0.000E+00	0.000E+00
U-234	5.002E-01	6.002E-03	2.898E-07	0.000E+00	0.000E+00
U-235	1.819E-02	2.183E-04	1.054E-08	0.000E+00	0.000E+00
U-238	4.456E-01	5.348E-03	2.582E-07	0.000E+00	0.000E+00

*The Surface Soil is the top layer of soil within the user specified mixing zone/depth.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Concentration of radionuclides in foodstuff media
at t = 3.000E+01 years*

Radio-Nuclide	Drinking Water pCi/L	Nonleafy Vegetable pCi/kg	Leafy Vegetable pCi/kg	Fodder Meat pCi/kg	Fodder Milk pCi/kg	Meat pCi/kg	Milk pCi/L	Fish pCi/kg	Crustacea pCi/kg
Ac-227	0.000E+00	3.488E-02	3.474E-02	3.522E-02	3.521E-02	1.408E-04	4.073E-05	0.000E+00	0.000E+00
Pa-231	0.000E+00	1.520E-01	1.519E-01	1.520E-01	1.520E-01	5.223E-02	4.235E-05	0.000E+00	0.000E+00
Pb-210	0.000E+00	5.410E+01	5.392E+01	5.452E+01	5.452E+01	3.017E+00	9.122E-01	0.000E+00	0.000E+00
Ra-226	0.000E+00	2.161E+02	2.161E+02	2.161E+02	2.161E+02	1.473E+01	1.192E+01	0.000E+00	0.000E+00
Th-230	0.000E+00	5.931E+00	5.932E+00	5.932E+00	5.932E+00	4.459E-02	1.844E-03	0.000E+00	0.000E+00
U-234	0.000E+00	1.045E+00	1.045E+00	1.045E+00	1.045E+00	2.518E-02	3.629E-02	0.000E+00	0.000E+00
U-235	0.000E+00	3.799E-02	3.799E-02	3.801E-02	3.800E-02	9.157E-04	1.319E-03	0.000E+00	0.000E+00
U-238	0.000E+00	9.307E-01	9.306E-01	9.311E-01	9.310E-01	2.244E-02	3.233E-02	0.000E+00	0.000E+00

*Concentrations are at consumption time and include radioactive decay and ingrowth during storage time.
For livestock fodder, consumption time is t minus meat or milk storage time.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Concentration of radionuclides in environmental media
at t = 1.000E+02 years

Radio-Nuclide	Contaminated Zone pCi/g	Surface Soil* pCi/g	Air Particulate pCi/m**3	Well Water pCi/L	Surface Water pCi/L
Ac-227	1.275E-02	5.100E-04	2.463E-08	0.000E+00	0.000E+00
Pa-231	1.458E-02	5.830E-04	2.815E-08	0.000E+00	0.000E+00
Pb-210	6.462E+00	2.585E-01	1.248E-05	0.000E+00	0.000E+00
Ra-226	6.484E+00	2.594E-01	1.252E-05	0.000E+00	0.000E+00
Th-230	7.079E+00	2.832E-01	1.367E-05	0.000E+00	0.000E+00
U-234	4.008E-01	1.603E-02	7.742E-07	0.000E+00	0.000E+00
U-235	1.458E-02	5.830E-04	2.815E-08	0.000E+00	0.000E+00
U-238	3.571E-01	1.428E-02	6.898E-07	0.000E+00	0.000E+00

*The Surface Soil is the top layer of soil within the user specified mixing zone/depth.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Concentration of radionuclides in foodstuff media
at t = 1.000E+02 years*

Radio-Nuclide	Drinking Water pCi/L	Nonleafy Vegetable pCi/kg	Leafy Vegetable pCi/kg	Fodder Meat pCi/kg	Fodder Milk pCi/kg	Meat pCi/kg	Milk pCi/L	Fish pCi/kg	Crustacea pCi/kg
Ac-227	0.000E+00	2.690E-02	2.679E-02	2.717E-02	2.716E-02	1.171E-04	3.498E-05	0.000E+00	0.000E+00
Pa-231	0.000E+00	1.224E-01	1.224E-01	1.225E-01	1.225E-01	4.311E-02	3.514E-05	0.000E+00	0.000E+00
Pb-210	0.000E+00	5.448E+01	5.429E+01	5.491E+01	5.491E+01	3.110E+00	9.457E-01	0.000E+00	0.000E+00
Ra-226	0.000E+00	2.179E+02	2.179E+02	2.179E+02	2.179E+02	1.494E+01	1.211E+01	0.000E+00	0.000E+00
Th-230	0.000E+00	5.946E+00	5.947E+00	5.947E+00	5.947E+00	5.459E-02	2.343E-03	0.000E+00	0.000E+00
U-234	0.000E+00	8.418E-01	8.417E-01	8.422E-01	8.421E-01	2.220E-02	3.260E-02	0.000E+00	0.000E+00
U-235	0.000E+00	3.061E-02	3.061E-02	3.063E-02	3.062E-02	8.072E-04	1.185E-03	0.000E+00	0.000E+00
U-238	0.000E+00	7.500E-01	7.499E-01	7.504E-01	7.502E-01	1.978E-02	2.904E-02	0.000E+00	0.000E+00

*Concentrations are at consumption time and include radioactive decay and ingrowth during storage time.
For livestock fodder, consumption time is t minus meat or milk storage time.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Concentration of radionuclides in environmental media
at t = 3.000E+02 years

Radio-Nuclide	Contaminated Zone pCi/g	Surface Soil* pCi/g	Air Particulate pCi/m**3	Well Water pCi/L	Surface Water pCi/L
Ac-227	6.746E-03	8.095E-04	3.909E-08	2.067E-03	3.349E-05
Pa-231	7.741E-03	9.289E-04	4.486E-08	0.000E+00	0.000E+00
Pb-210	6.504E+00	7.805E-01	3.769E-05	0.000E+00	0.000E+00
Ra-226	6.526E+00	7.831E-01	3.782E-05	0.000E+00	0.000E+00
Th-230	7.017E+00	8.420E-01	4.066E-05	0.000E+00	0.000E+00
U-234	2.129E-01	2.554E-02	1.233E-06	0.000E+00	0.000E+00
U-235	7.741E-03	9.289E-04	4.486E-08	0.000E+00	0.000E+00
U-238	1.897E-01	2.276E-02	1.099E-06	0.000E+00	0.000E+00

*The Surface Soil is the top layer of soil within the user specified mixing zone/depth.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Concentration of radionuclides in foodstuff media
at t = 3.000E+02 years*

Radio-Nuclide	Drinking Water pCi/L	Nonleafy Vegetable pCi/kg	Leafy Vegetable pCi/kg	Fodder Meat pCi/kg	Fodder Milk pCi/kg	Meat pCi/kg	Milk pCi/L	Fish pCi/kg	Crustacea pCi/kg
Ac-227	2.067E-03	1.517E-02	1.782E-02	1.832E-02	1.833E-02	7.820E-05	3.487E-05	5.018E-04	3.345E-02
Pa-231	0.000E+00	6.607E-02	6.606E-02	6.610E-02	6.609E-02	2.480E-02	2.050E-05	0.000E+00	0.000E+00
Pb-210	0.000E+00	5.570E+01	5.551E+01	5.614E+01	5.614E+01	3.387E+00	1.044E+00	0.000E+00	0.000E+00
Ra-226	0.000E+00	2.227E+02	2.227E+02	2.227E+02	2.227E+02	1.554E+01	1.264E+01	0.000E+00	0.000E+00
Th-230	0.000E+00	5.988E+00	5.990E+00	5.990E+00	5.990E+00	8.283E-02	3.752E-03	0.000E+00	0.000E+00
U-234	0.000E+00	4.542E-01	4.542E-01	4.544E-01	4.543E-01	1.485E-02	2.266E-02	0.000E+00	0.000E+00
U-235	0.000E+00	1.652E-02	1.652E-02	1.653E-02	1.652E-02	5.400E-04	8.239E-04	0.000E+00	0.000E+00
U-238	0.000E+00	4.047E-01	4.047E-01	4.049E-01	4.048E-01	1.323E-02	2.019E-02	0.000E+00	0.000E+00

*Concentrations are at consumption time and include radioactive decay and ingrowth during storage time.
For livestock fodder, consumption time is t minus meat or milk storage time.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Concentration of radionuclides in environmental media
at t = 1.000E+03 years

Radio-Nuclide	Contaminated Zone pCi/g	Surface Soil* pCi/g	Air Particulate pCi/m**3	Well Water pCi/L	Surface Water pCi/L
Ac-227	7.365E-04	2.946E-04	1.423E-08	2.495E-01	4.043E-03
Pa-231	8.452E-04	3.381E-04	1.633E-08	9.744E-02	1.578E-03
Pb-210	6.590E+00	2.636E+00	1.273E-04	1.135E-05	1.838E-07
Ra-226	6.608E+00	2.643E+00	1.276E-04	7.398E-07	1.199E-08
Th-230	6.803E+00	2.721E+00	1.314E-04	8.340E-05	1.351E-06
U-234	2.324E-02	9.294E-03	4.488E-07	2.679E+00	4.340E-02
U-235	8.452E-04	3.381E-04	1.633E-08	9.744E-02	1.578E-03
U-238	2.071E-02	8.283E-03	4.000E-07	2.387E+00	3.867E-02

*The Surface Soil is the top layer of soil within the user specified mixing zone/depth.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Concentration of radionuclides in foodstuff media
at t = 1.000E+03 years*

Radio-Nuclide	Drinking Water pCi/L	Nonleafy Vegetable pCi/kg	Leafy Vegetable pCi/kg	Fodder Meat pCi/kg	Fodder Milk pCi/kg	Meat pCi/kg	Milk pCi/L	Fish pCi/kg	Crustacea pCi/kg
Ac-227	2.495E-01	8.781E-02	4.148E-01	4.532E-01	4.532E-01	1.020E-03	1.300E-03	6.061E-02	4.040E+00
Pa-231	9.744E-02	4.135E-02	1.691E-01	1.844E-01	1.844E-01	8.789E-02	1.295E-04	1.578E-02	1.736E-01
Pb-210	1.135E-05	5.953E+01	5.933E+01	6.000E+01	6.000E+01	4.341E+00	1.387E+00	5.511E-05	1.837E-05
Ra-226	7.399E-07	2.379E+02	2.379E+02	2.379E+02	2.379E+02	1.750E+01	1.441E+01	6.003E-07	3.002E-06
Th-230	8.346E-05	6.124E+00	6.129E+00	6.129E+00	6.129E+00	1.777E-01	8.489E-03	1.352E-04	6.759E-04
U-234	2.679E+00	9.778E-01	4.488E+00	4.911E+00	4.911E+00	1.607E-01	4.220E-01	4.339E-01	2.604E+00
U-235	9.744E-02	3.557E-02	1.632E-01	1.786E-01	1.786E-01	5.844E-03	1.535E-02	1.578E-02	9.471E-02
U-238	2.387E+00	8.714E-01	3.999E+00	4.376E+00	4.377E+00	1.432E-01	3.761E-01	3.867E-01	2.320E+00

*Concentrations are at consumption time and include radioactive decay and ingrowth during storage time.
For livestock fodder, consumption time is t minus meat or milk storage time.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Industrial Worker
RESRAD Output Files

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Industrial Worker
File : C:\USERS\H5TDERJC\DESKTOP\NFSS\02 - VPH\13 - RISK ASSESSMENT\04 - RESRAD\FINAL\IW SURFACE SOIL.RAD

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Part I: Mixture Sums and Single Radionuclide Guidelines

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Industrial Worker
File : C:\USERS\H5TDERJC\DESKTOP\NFSS\02 - VPH\13 - RISK ASSESSMENT\04 - RESRAD\FINAL\IW SURFACE SOIL.RAD

Dose Conversion Factor (and Related) Parameter Summary
Dose Library: ICRP 72 (Adult)

Menu	Parameter	Current Value#	Base Case*	Parameter Name
A-1	DCF's for external ground radiation, (mrem/yr)/(pCi/g)			
A-1	Ac-227 (Source: ICRP 60)	4.485E-04	4.485E-04	DCF1(1)
A-1	At-218 (Source: ICRP 60)	4.878E-03	4.878E-03	DCF1(2)
A-1	Bi-210 (Source: ICRP 60)	5.476E-03	5.476E-03	DCF1(3)
A-1	Bi-211 (Source: ICRP 60)	2.373E-01	2.373E-01	DCF1(4)
A-1	Bi-214 (Source: ICRP 60)	9.325E+00	9.325E+00	DCF1(5)
A-1	Fr-223 (Source: ICRP 60)	1.813E-01	1.813E-01	DCF1(6)
A-1	Pa-231 (Source: ICRP 60)	1.762E-01	1.762E-01	DCF1(7)
A-1	Pa-234 (Source: ICRP 60)	1.088E+01	1.088E+01	DCF1(8)
A-1	Pa-234m (Source: ICRP 60)	9.867E-02	9.867E-02	DCF1(9)
A-1	Pb-210 (Source: ICRP 60)	1.981E-03	1.981E-03	DCF1(10)
A-1	Pb-211 (Source: ICRP 60)	2.915E-01	2.915E-01	DCF1(11)
A-1	Pb-214 (Source: ICRP 60)	1.243E+00	1.243E+00	DCF1(12)
A-1	Po-210 (Source: ICRP 60)	4.934E-05	4.934E-05	DCF1(13)
A-1	Po-211 (Source: ICRP 60)	4.485E-02	4.485E-02	DCF1(14)
A-1	Po-214 (Source: ICRP 60)	4.840E-04	4.840E-04	DCF1(15)
A-1	Po-215 (Source: ICRP 60)	9.456E-04	9.456E-04	DCF1(16)
A-1	Po-218 (Source: ICRP 60)	5.326E-05	5.326E-05	DCF1(17)
A-1	Ra-223 (Source: ICRP 60)	5.532E-01	5.532E-01	DCF1(18)
A-1	Ra-226 (Source: ICRP 60)	2.915E-02	2.915E-02	DCF1(19)
A-1	Rn-219 (Source: ICRP 60)	2.859E-01	2.859E-01	DCF1(20)
A-1	Rn-222 (Source: ICRP 60)	2.186E-03	2.186E-03	DCF1(21)
A-1	Th-227 (Source: ICRP 60)	4.803E-01	4.803E-01	DCF1(22)
A-1	Th-230 (Source: ICRP 60)	1.071E-03	1.071E-03	DCF1(23)
A-1	Th-231 (Source: ICRP 60)	3.214E-02	3.214E-02	DCF1(24)
A-1	Th-234 (Source: ICRP 60)	2.130E-02	2.130E-02	DCF1(25)
A-1	Tl-207 (Source: ICRP 60)	2.299E-02	2.299E-02	DCF1(26)
A-1	Tl-210 (Source: ICRP 60)	1.661E+01	1.661E+01	DCF1(27)
A-1	U-234 (Source: ICRP 60)	3.439E-04	3.439E-04	DCF1(28)
A-1	U-235 (Source: ICRP 60)	6.597E-01	6.597E-01	DCF1(29)
A-1	U-238 (Source: ICRP 60)	7.961E-05	7.961E-05	DCF1(30)
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	2.104E+00	2.035E+00	DCF2(1)
B-1	Pa-231	5.180E-01	5.180E-01	DCF2(2)
B-1	Pb-210+D	3.697E-02	2.072E-02	DCF2(3)
B-1	Ra-226+D	3.526E-02	3.515E-02	DCF2(4)
B-1	Th-230	3.700E-01	3.700E-01	DCF2(5)
B-1	U-234	3.478E-02	3.478E-02	DCF2(6)
B-1	U-235+D	3.145E-02	3.145E-02	DCF2(7)
B-1	U-238	2.960E-02	2.960E-02	DCF2(8)
B-1	U-238+D	2.963E-02	2.960E-02	DCF2(9)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	4.473E-03	4.070E-03	DCF3(1)
D-1	Pa-231	2.627E-03	2.627E-03	DCF3(2)
D-1	Pb-210+D	6.998E-03	2.553E-03	DCF3(3)
D-1	Ra-226+D	1.037E-03	1.036E-03	DCF3(4)
D-1	Th-230	7.770E-04	7.770E-04	DCF3(5)
D-1	U-234	1.813E-04	1.813E-04	DCF3(6)

Dose Conversion Factor (and Related) Parameter Summary (continued)
Dose Library: ICRP 72 (Adult)

Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-1	U-235+D	1.752E-04	1.739E-04	DCF3(7)
D-1	U-238	1.665E-04	1.665E-04	DCF3(8)
D-1	U-238+D	1.791E-04	1.665E-04	DCF3(9)
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	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(2,1)
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(2,2)
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(2,3)
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(3,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(3,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(3,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(4,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(4,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(4,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(5,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(5,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(5,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(6,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(6,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(6,3)
D-34				
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(7,1)
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(7,2)
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(7,3)
D-34				
D-34	U-238 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(8,1)
D-34	U-238 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(8,2)
D-34	U-238 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(8,3)
D-34				
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(9,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(9,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(9,3)
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	Pa-231 , fish	1.000E+01	1.000E+01	BIOFAC(2,1)
D-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(2,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(3,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(3,2)

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Dose Conversion Factor (and Related) Parameter Summary (continued)

Dose Library: ICRP 72 (Adult)

Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(4,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(4,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(5,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(5,2)
D-5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(6,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(6,2)
D-5				
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIOFAC(7,1)
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(7,2)
D-5				
D-5	U-238 , fish	1.000E+01	1.000E+01	BIOFAC(8,1)
D-5	U-238 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(8,2)
D-5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(9,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(9,2)

#For DCF1(xxx) only, factors are for infinite depth & area. See ETFG table in Ground Pathway of Detailed Report.

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

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Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.620E+04	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	1.500E-01	2.000E+00	---	THICK0
R011	Fraction of contamination that is submerged	0.000E+00	0.000E+00	---	SUBMFRACT
R011	Length parallel to aquifer flow (m)	not used	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Ac-227	1.000E+00	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g): Pa-231	1.000E+00	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Pb-210	1.000E+00	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): Ra-226	1.000E+00	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Th-230	1.000E+00	0.000E+00	---	S1(5)
R012	Initial principal radionuclide (pCi/g): U-234	1.000E+00	0.000E+00	---	S1(6)
R012	Initial principal radionuclide (pCi/g): U-235	1.000E+00	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): U-238	1.000E+00	0.000E+00	---	S1(8)
R012	Concentration in groundwater (pCi/L): Ac-227	not used	0.000E+00	---	W1(1)
R012	Concentration in groundwater (pCi/L): Pa-231	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Pb-210	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	W1(4)
R012	Concentration in groundwater (pCi/L): Th-230	not used	0.000E+00	---	W1(5)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(6)
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	---	W1(7)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(8)
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)	1.700E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	6.000E-05	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.200E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	3.600E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	6.840E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	1.040E+01	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	4.400E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	9.000E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	4.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	not used	1.000E+06	---	WAREA

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R013	Accuracy for water/soil computations	not used	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	not used	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	not used	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	not used	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	not used	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	not used	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	not used	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	not used	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	not used	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	not used	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	not used	2.500E+02	---	UW
R015	Number of unsaturated zone strata	not used	1	---	NS
R015	Unsat. zone 1, thickness (m)	not used	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	not used	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	not used	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	not used	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	not used	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	not used	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	not used	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Ac-227				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	not used	2.000E+01	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	not used	2.000E+01	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.179E-02	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for Pa-231				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.890E-02	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Pb-210				
R016	Contaminated zone (cm**3/g)	2.100E+03	1.000E+02	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	not used	1.000E+02	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	6.909E-04	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	3.800E+04	7.000E+01	---	DCNUCC(4)
R016	Unsaturated zone 1 (cm**3/g)	not used	7.000E+01	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.818E-05	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Th-230				
R016	Contaminated zone (cm**3/g)	4.500E+03	6.000E+04	---	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	not used	6.000E+04	---	DCNUCU(5,1)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.224E-04	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(6)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.890E-02	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R016	Distribution coefficients for U-235				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(7)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(7,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.890E-02	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(8)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(8,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.890E-02	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R017	Inhalation rate (m**3/yr)	1.020E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	2.500E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	2.100E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	2.000E-01	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	2.900E-02	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)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	2.050E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	not used	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	not used	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	not used	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	not used	-1	---	FPLANT
R018	Contamination fraction of meat	not used	-1	---	FMEAT
R018	Contamination fraction of milk	not used	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	not used	5.000E-01	---	LSI
R019	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	not used	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	not used	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	not used	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	not used	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	not used	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	not used	8.000E-02	---	TE(3)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	not used	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	not used	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	not used	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
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

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Industrial Worker
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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	257	---	---	KYMAX

Summary of Pathway Selections

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

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Industrial Worker

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Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	16200.00 square meters	Ac-227	1.000E+00
Thickness:	0.15 meters	Pa-231	1.000E+00
Cover Depth:	0.00 meters	Pb-210	1.000E+00
		Ra-226	1.000E+00
		Th-230	1.000E+00
		U-234	1.000E+00
		U-235	1.000E+00
		U-238	1.000E+00

Total Dose TDOSE(t), mrem/yr

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

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

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	9.395E-01	9.261E-01	9.022E-01	8.412E-01	7.596E-01	6.898E-01	6.528E-01	5.174E-01
M(t):	3.758E-02	3.704E-02	3.609E-02	3.365E-02	3.038E-02	2.759E-02	2.611E-02	2.070E-02

Maximum TDOSE(t): 9.395E-01 mrem/yr at t = 0.000E+00 years

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Industrial Worker
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	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.
Ac-227	1.174E-01	0.1250	1.789E-02	0.0190	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.994E-02	0.0212
Pa-231	1.340E-02	0.0143	4.856E-03	0.0052	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.247E-02	0.0133
Pb-210	5.077E-04	0.0005	3.257E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.233E-02	0.0344
Ra-226	6.482E-01	0.6899	3.206E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.371E-03	0.0057
Th-230	2.139E-04	0.0002	3.311E-03	0.0035	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.647E-03	0.0039
U-234	2.344E-05	0.0000	3.068E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.388E-04	0.0009
U-235	4.606E-02	0.0490	2.775E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.105E-04	0.0009
U-238	9.879E-03	0.0105	2.614E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.285E-04	0.0009
Total	8.357E-01	0.8895	2.754E-02	0.0293	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.624E-02	0.0812

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.553E-01	0.1653
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.073E-02	0.0327
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.316E-02	0.0353
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.539E-01	0.6960
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.172E-03	0.0076
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.169E-03	0.0012
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.714E-02	0.0502
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.097E-02	0.0117
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.395E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Industrial Worker
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 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.
Ac-227	1.059E-01	0.1143	1.612E-02	0.0174	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.797E-02	0.0194
Pa-231	1.652E-02	0.0178	5.249E-03	0.0057	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.271E-02	0.0137
Pb-210	4.918E-04	0.0005	3.154E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.130E-02	0.0338
Ra-226	6.478E-01	0.6995	3.302E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.354E-03	0.0069
Th-230	4.945E-04	0.0005	3.309E-03	0.0036	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.647E-03	0.0039
U-234	2.277E-05	0.0000	2.980E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.146E-04	0.0009
U-235	4.474E-02	0.0483	2.696E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.873E-04	0.0009
U-238	9.597E-03	0.0104	2.538E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.046E-04	0.0009
Total	8.256E-01	0.8914	2.614E-02	0.0282	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.439E-02	0.0803

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.400E-01	0.1511
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.448E-02	0.0372
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.211E-02	0.0347
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.545E-01	0.7067
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.450E-03	0.0080
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.135E-03	0.0012
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.580E-02	0.0495
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.066E-02	0.0115
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.261E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Industrial Worker
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 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.
Ac-227	8.604E-02	0.0954	1.309E-02	0.0145	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.460E-02	0.0162
Pa-231	2.150E-02	0.0238	5.849E-03	0.0065	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.299E-02	0.0144
Pb-210	4.615E-04	0.0005	2.957E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.935E-02	0.0325
Ra-226	6.471E-01	0.7172	3.486E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.227E-03	0.0091
Th-230	1.055E-03	0.0012	3.304E-03	0.0037	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.648E-03	0.0040
U-234	2.151E-05	0.0000	2.811E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.683E-04	0.0009
U-235	4.223E-02	0.0468	2.545E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.431E-04	0.0008
U-238	9.057E-03	0.0100	2.394E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.588E-04	0.0008
Total	8.075E-01	0.8950	2.366E-02	0.0262	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.108E-02	0.0788

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.137E-01	0.1261
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.033E-02	0.0447
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.011E-02	0.0334
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.557E-01	0.7267
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.007E-03	0.0089
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.071E-03	0.0012
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.323E-02	0.0479
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.006E-02	0.0111
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.022E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Industrial Worker
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 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.
Ac-227	4.164E-02	0.0495	6.320E-03	0.0075	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.047E-03	0.0084
Pa-231	2.974E-02	0.0354	6.614E-03	0.0079	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.264E-02	0.0150
Pb-210	3.694E-04	0.0004	2.361E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.343E-02	0.0279
Ra-226	6.446E-01	0.7662	4.039E-04	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.388E-02	0.0165
Th-230	3.007E-03	0.0036	3.288E-03	0.0039	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.663E-03	0.0044
U-234	1.769E-05	0.0000	2.292E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.260E-04	0.0007
U-235	3.449E-02	0.0410	2.081E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.070E-04	0.0007
U-238	7.395E-03	0.0088	1.950E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.181E-04	0.0007
Total	7.612E-01	0.9049	1.749E-02	0.0208	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.251E-02	0.0743

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.501E-02	0.0654
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.900E-02	0.0582
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.404E-02	0.0286
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.588E-01	0.7832
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.959E-03	0.0118
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.729E-04	0.0010
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.531E-02	0.0420
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.208E-03	0.0098
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.412E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Industrial Worker
File : C:\USERS\H5TDERJC\DESKTOP\NFSS\02 - VPH\13 - RISK ASSESSMENT\04 - RESRAD\FINAL\IW SURFACE SOIL.RAD

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	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.
Ac-227	5.235E-03	0.0069	7.891E-04	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.799E-04	0.0012
Pa-231	2.437E-02	0.0321	4.841E-03	0.0064	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.327E-03	0.0110
Pb-210	1.956E-04	0.0003	1.241E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.231E-02	0.0162
Ra-226	6.373E-01	0.8390	5.041E-04	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.428E-02	0.0320
Th-230	8.509E-03	0.0112	3.244E-03	0.0043	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.779E-03	0.0050
U-234	1.074E-05	0.0000	1.280E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.489E-04	0.0005
U-235	1.935E-02	0.0255	1.177E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.411E-04	0.0004
U-238	4.143E-03	0.0055	1.085E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.440E-04	0.0005
Total	6.991E-01	0.9204	9.857E-03	0.0130	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.061E-02	0.0666

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.904E-03	0.0091
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.754E-02	0.0494
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.263E-02	0.0166
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.621E-01	0.8716
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.553E-02	0.0205
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.876E-04	0.0006
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.981E-02	0.0261
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.595E-03	0.0061
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.596E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Industrial Worker
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 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.
Ac-227	3.689E-06	0.0000	5.425E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.049E-07	0.0000
Pa-231	3.498E-03	0.0051	6.643E-04	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.117E-03	0.0016
Pb-210	2.114E-05	0.0000	1.304E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.294E-03	0.0019
Ra-226	6.118E-01	0.8869	5.768E-04	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.303E-02	0.0479
Th-230	2.689E-02	0.0390	3.097E-03	0.0045	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.491E-03	0.0065
U-234	7.005E-06	0.0000	1.729E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.597E-05	0.0001
U-235	2.558E-03	0.0037	1.610E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.549E-05	0.0001
U-238	5.452E-04	0.0008	1.395E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.423E-05	0.0001
Total	6.453E-01	0.9355	4.399E-03	0.0064	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.007E-02	0.0581

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.837E-06	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.279E-03	0.0077
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.328E-03	0.0019
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.454E-01	0.9357
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.448E-02	0.0500
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.026E-05	0.0001
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.619E-03	0.0038
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.034E-04	0.0009
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.898E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Industrial Worker
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 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.
Ac-227	3.632E-15	0.0000	4.965E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.537E-16	0.0000
Pa-231	1.062E-05	0.0000	1.875E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.150E-06	0.0000
Pb-210	3.660E-08	0.0000	2.078E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.062E-06	0.0000
Ra-226	5.424E-01	0.8309	4.919E-04	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.862E-02	0.0438
Th-230	7.218E-02	0.1106	2.700E-03	0.0041	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.353E-03	0.0097
U-234	2.014E-05	0.0000	8.944E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.991E-06	0.0000
U-235	7.877E-06	0.0000	5.356E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.422E-07	0.0000
U-238	1.658E-06	0.0000	3.964E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.255E-07	0.0000
Total	6.146E-01	0.9415	3.194E-03	0.0049	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.498E-02	0.0536

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.683E-15	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.564E-05	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.119E-06	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.715E-01	0.8755
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.123E-02	0.1244
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.303E-05	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.073E-06	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.823E-06	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.528E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Industrial Worker
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pa-231	1.563E-14	0.0000	2.066E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.472E-15	0.0000
Pb-210	7.785E-18	0.0000	3.103E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.080E-16	0.0000
Ra-226	3.369E-01	0.6511	2.411E-04	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.403E-02	0.0271
Th-230	1.568E-01	0.3030	1.536E-03	0.0030	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.905E-03	0.0153
U-234	4.778E-05	0.0001	4.829E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.423E-06	0.0000
U-235	1.228E-14	0.0000	9.075E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.109E-16	0.0000
U-238	4.580E-09	0.0000	4.780E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.338E-10	0.0000
Total	4.937E-01	0.9542	1.778E-03	0.0034	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.194E-02	0.0424

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.117E-14	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.189E-16	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.511E-01	0.6787
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.662E-01	0.3212
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.069E-05	0.0001
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.258E-14	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.862E-09	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.174E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Industrial Worker
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Dose/Source Ratios Summed Over All Pathways
Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g) 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-227+D	Ac-227+D	1.000E+00	1.553E-01	1.400E-01	1.137E-01	5.501E-02	6.904E-03	4.837E-06	4.683E-15	0.000E+00
Pa-231	Pa-231	1.000E+00	2.824E-02	2.743E-02	2.588E-02	2.110E-02	1.177E-02	1.526E-03	4.440E-06	5.604E-15
Pa-231	Ac-227+D	1.000E+00	2.490E-03	7.044E-03	1.446E-02	2.790E-02	2.577E-02	3.753E-03	1.120E-05	1.557E-14
Pa-231	äDSR(j)		3.073E-02	3.448E-02	4.033E-02	4.900E-02	3.754E-02	5.279E-03	1.564E-05	2.117E-14
Pb-210+D	Pb-210+D	1.000E+00	3.316E-02	3.211E-02	3.011E-02	2.404E-02	1.263E-02	1.328E-03	2.119E-06	3.189E-16
Ra-226+D	Ra-226+D	1.000E+00	6.534E-01	6.530E-01	6.522E-01	6.496E-01	6.420E-01	6.161E-01	5.459E-01	3.385E-01
Ra-226+D	Pb-210+D	1.000E+00	5.180E-04	1.531E-03	3.461E-03	9.287E-03	2.004E-02	2.933E-02	2.560E-02	1.264E-02
Ra-226+D	äDSR(j)		6.539E-01	6.545E-01	6.557E-01	6.588E-01	6.621E-01	6.454E-01	5.715E-01	3.511E-01
Th-230	Th-230	1.000E+00	7.031E-03	7.026E-03	7.015E-03	6.980E-03	6.878E-03	6.532E-03	5.609E-03	3.047E-03
Th-230	Ra-226+D	1.000E+00	1.415E-04	4.244E-04	9.892E-04	2.957E-03	8.501E-03	2.701E-02	7.258E-02	1.575E-01
Th-230	Pb-210+D	1.000E+00	7.499E-08	5.199E-07	2.690E-06	2.231E-05	1.534E-04	9.337E-04	3.036E-03	5.681E-03
Th-230	äDSR(j)		7.172E-03	7.450E-03	8.007E-03	9.959E-03	1.553E-02	3.448E-02	8.123E-02	1.662E-01
U-234	U-234	1.000E+00	1.169E-03	1.135E-03	1.071E-03	8.722E-04	4.855E-04	6.242E-05	1.771E-07	1.996E-16
U-234	Th-230	1.000E+00	3.134E-08	9.279E-08	2.103E-07	5.699E-07	1.261E-06	1.942E-06	1.767E-06	9.602E-07
U-234	Ra-226+D	1.000E+00	4.216E-10	2.926E-09	1.517E-08	1.269E-07	8.913E-07	5.723E-06	2.025E-05	4.800E-05
U-234	Pb-210+D	1.000E+00	1.681E-13	2.487E-12	2.816E-11	6.708E-10	1.220E-08	1.765E-07	8.339E-07	1.729E-06
U-234	äDSR(j)		1.169E-03	1.135E-03	1.071E-03	8.729E-04	4.876E-04	7.026E-05	2.303E-05	5.069E-05
U-235+D	U-235+D	1.000E+00	4.714E-02	4.580E-02	4.322E-02	3.530E-02	1.979E-02	2.609E-03	7.976E-06	1.213E-14
U-235+D	Pa-231	1.000E+00	2.973E-07	8.692E-07	1.915E-06	4.686E-06	7.597E-06	3.248E-06	2.832E-08	1.199E-16
U-235+D	Ac-227+D	1.000E+00	1.762E-08	1.178E-07	5.618E-07	3.502E-06	1.123E-05	6.928E-06	6.827E-08	3.286E-16
U-235+D	äDSR(j)		4.714E-02	4.580E-02	4.323E-02	3.531E-02	1.981E-02	2.619E-03	8.073E-06	1.258E-14
U-238	U-238		5.400E-05	5.600E-08	5.438E-08	5.128E-08	4.178E-08	2.325E-08	2.989E-09	8.472E-12	9.504E-21
U-238+D	U-238+D	9.999E-01	1.097E-02	1.066E-02	1.005E-02	8.208E-03	4.595E-03	6.033E-04	1.821E-06	2.640E-15
U-238+D	U-234	9.999E-01	1.649E-09	4.820E-09	1.062E-08	2.596E-08	4.197E-08	1.779E-08	1.509E-10	5.669E-19
U-238+D	Th-230	9.999E-01	2.947E-14	2.029E-13	1.032E-12	8.063E-12	4.668E-11	1.595E-10	1.751E-10	9.529E-11
U-238+D	Ra-226+D	9.999E-01	2.975E-16	4.407E-15	4.999E-14	1.199E-12	2.220E-11	3.383E-10	1.749E-09	4.601E-09
U-238+D	Pb-210+D	9.999E-01	9.504E-20	2.900E-18	7.054E-17	4.859E-15	2.417E-13	9.220E-12	7.058E-11	1.656E-10
U-238+D	äDSR(j)		1.097E-02	1.066E-02	1.005E-02	8.208E-03	4.595E-03	6.034E-04	1.823E-06	4.862E-09

The DSR includes contributions from associated (half-life ó 180 days) daughters.

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Industrial Worker
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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
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Ac-227 1.610E+02 1.786E+02 2.198E+02 4.545E+02 3.621E+03 5.169E+06 *7.232E+13 *7.232E+13
Pa-231 8.134E+02 7.251E+02 6.198E+02 5.103E+02 6.660E+02 4.736E+03 1.598E+06 *4.723E+10
Pb-210 7.539E+02 7.785E+02 8.303E+02 1.040E+03 1.979E+03 1.882E+04 1.180E+07 *7.634E+13
Ra-226 3.823E+01 3.820E+01 3.813E+01 3.795E+01 3.776E+01 3.873E+01 4.374E+01 7.120E+01
Th-230 3.486E+03 3.356E+03 3.122E+03 2.510E+03 1.609E+03 7.251E+02 3.078E+02 1.504E+02
U-234 2.138E+04 2.202E+04 2.334E+04 2.864E+04 5.127E+04 3.558E+05 1.086E+06 4.932E+05
U-235 5.303E+02 5.459E+02 5.784E+02 7.081E+02 1.262E+03 9.544E+03 *2.161E+06 *2.161E+06
U-238 2.279E+03 2.346E+03 2.486E+03 3.046E+03 5.440E+03 4.143E+04 *3.361E+05 *3.361E+05
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*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) (pCi/g)	G(i,tmin) (pCi/g)	DSR(i,tmax) (pCi/g)	G(i,tmax) (pCi/g)
Ac-227	1.000E+00	0.000E+00	1.553E-01	1.610E+02	1.553E-01	1.610E+02
Pa-231	1.000E+00	11.92 ñ 0.02	4.929E-02	5.072E+02	3.073E-02	8.134E+02
Pb-210	1.000E+00	0.000E+00	3.316E-02	7.539E+02	3.316E-02	7.539E+02
Ra-226	1.000E+00	30.03 ñ 0.06	6.621E-01	3.776E+01	6.539E-01	3.823E+01
Th-230	1.000E+00	1.000E+03	1.662E-01	1.504E+02	7.172E-03	3.486E+03
U-234	1.000E+00	0.000E+00	1.169E-03	2.138E+04	1.169E-03	2.138E+04
U-235	1.000E+00	0.000E+00	4.714E-02	5.303E+02	4.714E-02	5.303E+02
U-238	1.000E+00	0.000E+00	1.097E-02	2.279E+03	1.097E-02	2.279E+03

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Summary : NFSS VP H Prime Surface Soil (0-0.15m) Industrial Worker
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Individual Nuclide Dose Summed Over All Pathways
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	DOSE(j,t), mrem/yr t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-227	Ac-227	1.000E+00	1.553E-01	1.400E-01	1.137E-01	5.501E-02	6.904E-03	4.837E-06	4.683E-15	0.000E+00
Ac-227	Pa-231	1.000E+00	2.490E-03	7.044E-03	1.446E-02	2.790E-02	2.577E-02	3.753E-03	1.120E-05	1.557E-14
Ac-227	U-235	1.000E+00	1.762E-08	1.178E-07	5.618E-07	3.502E-06	1.123E-05	6.928E-06	6.827E-08	3.286E-16
Ac-227	äDOSE(j)		1.577E-01	1.470E-01	1.282E-01	8.291E-02	3.268E-02	3.764E-03	1.127E-05	1.590E-14
Pa-231	Pa-231	1.000E+00	2.824E-02	2.743E-02	2.588E-02	2.110E-02	1.177E-02	1.526E-03	4.440E-06	5.604E-15
Pa-231	U-235	1.000E+00	2.973E-07	8.692E-07	1.915E-06	4.686E-06	7.597E-06	3.248E-06	2.832E-08	1.199E-16
Pa-231	äDOSE(j)		2.824E-02	2.743E-02	2.588E-02	2.110E-02	1.178E-02	1.529E-03	4.469E-06	5.724E-15
Pb-210	Pb-210	1.000E+00	3.316E-02	3.211E-02	3.011E-02	2.404E-02	1.263E-02	1.328E-03	2.119E-06	3.189E-16
Pb-210	Ra-226	1.000E+00	5.180E-04	1.531E-03	3.461E-03	9.287E-03	2.004E-02	2.933E-02	2.560E-02	1.264E-02
Pb-210	Th-230	1.000E+00	7.499E-08	5.199E-07	2.690E-06	2.231E-05	1.534E-04	9.337E-04	3.036E-03	5.681E-03
Pb-210	U-234	1.000E+00	1.681E-13	2.487E-12	2.816E-11	6.708E-10	1.220E-08	1.765E-07	8.339E-07	1.729E-06
Pb-210	U-238	9.999E-01	9.504E-20	2.900E-18	7.054E-17	4.859E-15	2.417E-13	9.220E-12	7.058E-11	1.656E-10
Pb-210	äDOSE(j)		3.368E-02	3.364E-02	3.357E-02	3.335E-02	3.283E-02	3.159E-02	2.864E-02	1.832E-02
Ra-226	Ra-226	1.000E+00	6.534E-01	6.530E-01	6.522E-01	6.496E-01	6.420E-01	6.161E-01	5.459E-01	3.385E-01
Ra-226	Th-230	1.000E+00	1.415E-04	4.244E-04	9.892E-04	2.957E-03	8.501E-03	2.701E-02	7.258E-02	1.575E-01
Ra-226	U-234	1.000E+00	4.216E-10	2.926E-09	1.517E-08	1.269E-07	8.913E-07	5.723E-06	2.025E-05	4.800E-05
Ra-226	U-238	9.999E-01	2.975E-16	4.407E-15	4.999E-14	1.199E-12	2.220E-11	3.383E-10	1.749E-09	4.601E-09
Ra-226	äDOSE(j)		6.535E-01	6.534E-01	6.532E-01	6.525E-01	6.505E-01	6.431E-01	6.185E-01	4.960E-01
Th-230	Th-230	1.000E+00	7.031E-03	7.026E-03	7.015E-03	6.980E-03	6.878E-03	6.532E-03	5.609E-03	3.047E-03
Th-230	U-234	1.000E+00	3.134E-08	9.279E-08	2.103E-07	5.699E-07	1.261E-06	1.942E-06	1.767E-06	9.602E-07
Th-230	U-238	9.999E-01	2.947E-14	2.029E-13	1.032E-12	8.063E-12	4.668E-11	1.595E-10	1.751E-10	9.529E-11
Th-230	äDOSE(j)		7.031E-03	7.026E-03	7.016E-03	6.980E-03	6.880E-03	6.534E-03	5.611E-03	3.048E-03
U-234	U-234	1.000E+00	1.169E-03	1.135E-03	1.071E-03	8.722E-04	4.855E-04	6.242E-05	1.771E-07	1.996E-16
U-234	U-238	9.999E-01	1.649E-09	4.820E-09	1.062E-08	2.596E-08	4.197E-08	1.779E-08	1.509E-10	5.669E-19
U-234	äDOSE(j)		1.169E-03	1.135E-03	1.071E-03	8.722E-04	4.855E-04	6.244E-05	1.772E-07	2.002E-16
U-235	U-235	1.000E+00	4.714E-02	4.580E-02	4.322E-02	3.530E-02	1.979E-02	2.609E-03	7.976E-06	1.213E-14
U-238	U-238	5.400E-05	5.600E-08	5.438E-08	5.128E-08	4.178E-08	2.325E-08	2.989E-09	8.472E-12	9.504E-21
U-238	U-238	9.999E-01	1.097E-02	1.066E-02	1.005E-02	8.208E-03	4.595E-03	6.033E-04	1.821E-06	2.640E-15
U-238	äDOSE(j)		1.097E-02	1.066E-02	1.005E-02	8.208E-03	4.595E-03	6.033E-04	1.821E-06	2.640E-15

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

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Industrial Worker
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Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-227	Ac-227	1.000E+00	1.000E+00	9.016E-01	7.328E-01	3.548E-01	4.466E-02	3.160E-05	3.155E-14	1.401E-45
Ac-227	Pa-231	1.000E+00	0.000E+00	2.980E-02	7.845E-02	1.679E-01	1.599E-01	2.363E-02	7.275E-05	1.176E-13
Ac-227	U-235	1.000E+00	0.000E+00	3.192E-07	2.583E-06	1.996E-05	6.832E-05	4.337E-05	4.425E-07	2.481E-15
Ac-227	äS(j):		1.000E+00	9.314E-01	8.113E-01	5.227E-01	2.047E-01	2.370E-02	7.319E-05	1.201E-13
Pa-231	Pa-231	1.000E+00	1.000E+00	9.715E-01	9.169E-01	7.489E-01	4.200E-01	5.547E-02	1.707E-04	2.760E-13
Pa-231	U-235	1.000E+00	0.000E+00	2.056E-05	5.820E-05	1.585E-04	2.667E-04	1.175E-04	1.087E-06	5.902E-15
Pa-231	äS(j):		1.000E+00	9.715E-01	9.170E-01	7.490E-01	4.202E-01	5.559E-02	1.718E-04	2.819E-13
Pb-210	Pb-210	1.000E+00	1.000E+00	9.687E-01	9.091E-01	7.278E-01	3.855E-01	4.170E-02	7.249E-05	1.588E-14
Pb-210	Ra-226	1.000E+00	0.000E+00	3.059E-02	8.888E-02	2.656E-01	5.962E-01	9.059E-01	8.620E-01	6.198E-01
Pb-210	Th-230	1.000E+00	0.000E+00	6.660E-06	5.867E-05	6.056E-04	4.479E-03	2.866E-02	1.020E-01	2.784E-01
Pb-210	U-234	1.000E+00	0.000E+00	1.990E-11	5.210E-10	1.736E-08	3.510E-07	5.402E-06	2.802E-05	8.474E-05
Pb-210	U-238	9.999E-01	0.000E+00	1.406E-17	1.099E-15	1.197E-13	6.851E-12	2.813E-10	2.371E-09	8.112E-09
Pb-210	äS(j):		1.000E+00	9.993E-01	9.980E-01	9.940E-01	9.862E-01	9.762E-01	9.641E-01	8.982E-01
Ra-226	Ra-226	1.000E+00	1.000E+00	9.995E-01	9.986E-01	9.953E-01	9.860E-01	9.540E-01	8.681E-01	6.241E-01
Ra-226	Th-230	1.000E+00	0.000E+00	4.330E-04	1.298E-03	4.315E-03	1.284E-02	4.162E-02	1.152E-01	2.902E-01
Ra-226	U-234	1.000E+00	0.000E+00	1.931E-09	1.704E-08	1.770E-07	1.330E-06	8.800E-06	3.214E-05	8.845E-05
Ra-226	U-238	9.999E-01	0.000E+00	1.816E-15	4.762E-14	1.595E-12	3.265E-11	5.187E-10	2.775E-09	8.479E-09
Ra-226	äS(j):		1.000E+00	1.000E+00	9.999E-01	9.996E-01	9.988E-01	9.956E-01	9.834E-01	9.144E-01
Th-230	Th-230	1.000E+00	1.000E+00	9.997E-01	9.990E-01	9.967E-01	9.901E-01	9.674E-01	9.054E-01	7.179E-01
Th-230	U-234	1.000E+00	0.000E+00	8.872E-06	2.586E-05	7.804E-05	1.796E-04	2.873E-04	2.852E-04	2.262E-04
Th-230	U-238	9.999E-01	0.000E+00	1.251E-11	1.084E-10	1.054E-09	6.558E-09	2.355E-08	2.826E-08	2.245E-08
Th-230	äS(j):		1.000E+00	9.997E-01	9.990E-01	9.968E-01	9.903E-01	9.677E-01	9.056E-01	7.181E-01
U-234	U-234	1.000E+00	1.000E+00	9.715E-01	9.170E-01	7.490E-01	4.202E-01	5.558E-02	1.717E-04	2.811E-13
U-234	U-238	9.999E-01	0.000E+00	2.754E-06	7.798E-06	2.123E-05	3.574E-05	1.576E-05	1.460E-07	7.980E-16
U-234	äS(j):		1.000E+00	9.715E-01	9.170E-01	7.490E-01	4.202E-01	5.559E-02	1.718E-04	2.819E-13
U-235	U-235	1.000E+00	1.000E+00	9.715E-01	9.170E-01	7.490E-01	4.202E-01	5.559E-02	1.718E-04	2.819E-13
U-238	U-238	5.400E-05	5.400E-05	5.246E-05	4.952E-05	4.045E-05	2.269E-05	3.002E-06	9.277E-09	1.522E-17
U-238	U-238	9.999E-01	9.999E-01	9.715E-01	9.169E-01	7.490E-01	4.202E-01	5.559E-02	1.718E-04	2.819E-13
U-238	äS(j):		1.000E+00	9.715E-01	9.170E-01	7.490E-01	4.202E-01	5.559E-02	1.718E-04	2.819E-13

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

RESCALC.EXE execution time = 1.45 seconds

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Part III: Intake Quantities and Health Risk Factors

Cancer Risk Slope Factors Summary Table
Risk Library: FGR 13 Morbidity

Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-1	Ground external radiation slope factors, 1/yr per (pCi/g):			
Sf-1	Ac-227+D	1.47E-06	3.48E-10	SLPF(1,1)
Sf-1	Pa-231	1.39E-07	1.39E-07	SLPF(2,1)
Sf-1	Pb-210+D	4.21E-09	1.41E-09	SLPF(3,1)
Sf-1	Ra-226+D	8.49E-06	2.29E-08	SLPF(4,1)
Sf-1	Th-230	8.19E-10	8.19E-10	SLPF(5,1)
Sf-1	U-234	2.52E-10	2.52E-10	SLPF(6,1)
Sf-1	U-235+D	5.43E-07	5.18E-07	SLPF(7,1)
Sf-1	U-238	4.99E-11	4.99E-11	SLPF(8,1)
Sf-1	U-238+D	1.14E-07	4.99E-11	SLPF(9,1)
Sf-2	Inhalation, slope factors, 1/(pCi):			
Sf-2	Ac-227+D	2.13E-07	1.49E-07	SLPF(1,2)
Sf-2	Pa-231	7.62E-08	7.62E-08	SLPF(2,2)
Sf-2	Pb-210+D	3.08E-08	1.58E-08	SLPF(3,2)
Sf-2	Ra-226+D	2.83E-08	2.82E-08	SLPF(4,2)
Sf-2	Th-230	3.40E-08	3.40E-08	SLPF(5,2)
Sf-2	U-234	2.78E-08	2.78E-08	SLPF(6,2)
Sf-2	U-235+D	2.50E-08	2.50E-08	SLPF(7,2)
Sf-2	U-238	2.36E-08	2.36E-08	SLPF(8,2)
Sf-2	U-238+D	2.36E-08	2.36E-08	SLPF(9,2)
Sf-3	Food ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.53E-10	2.45E-10	SLPF(1,3)
Sf-3	Pa-231	2.26E-10	2.26E-10	SLPF(2,3)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF(3,3)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF(4,3)
Sf-3	Th-230	1.19E-10	1.19E-10	SLPF(5,3)
Sf-3	U-234	9.55E-11	9.55E-11	SLPF(6,3)
Sf-3	U-235+D	9.76E-11	9.44E-11	SLPF(7,3)
Sf-3	U-238	8.66E-11	8.66E-11	SLPF(8,3)
Sf-3	U-238+D	1.21E-10	8.66E-11	SLPF(9,3)
Sf-3	Water ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	4.86E-10	2.01E-10	SLPF(1,4)
Sf-3	Pa-231	1.73E-10	1.73E-10	SLPF(2,4)
Sf-3	Pb-210+D	2.66E-09	8.81E-10	SLPF(3,4)
Sf-3	Ra-226+D	3.86E-10	3.85E-10	SLPF(4,4)
Sf-3	Th-230	9.10E-11	9.10E-11	SLPF(5,4)
Sf-3	U-234	7.07E-11	7.07E-11	SLPF(6,4)
Sf-3	U-235+D	7.18E-11	6.96E-11	SLPF(7,4)
Sf-3	U-238	6.40E-11	6.40E-11	SLPF(8,4)
Sf-3	U-238+D	8.71E-11	6.40E-11	SLPF(9,4)
Sf-3	Soil ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.53E-10	2.45E-10	SLPF(1,5)
Sf-3	Pa-231	2.26E-10	2.26E-10	SLPF(2,5)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF(3,5)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF(4,5)
Sf-3	Th-230	1.19E-10	1.19E-10	SLPF(5,5)

Cancer Risk Slope Factors Summary Table (continued)
Risk Library: FGR 13 Morbidity

Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-3	U-234	9.55E-11	9.55E-11	SLPF(6,5)
Sf-3	U-235+D	9.76E-11	9.44E-11	SLPF(7,5)
Sf-3	U-238	8.66E-11	8.66E-11	SLPF(8,5)
Sf-3	U-238+D	1.21E-10	8.66E-11	SLPF(9,5)
Sf-Rn	Radon Inhalation slope factors, 1/(pCi):			
Sf-Rn	Rn-222	1.80E-12	1.80E-12	SLPFRN(1,1)
Sf-Rn	Po-218	3.70E-12	3.70E-12	SLPFRN(1,2)
Sf-Rn	Pb-214	6.20E-12	6.20E-12	SLPFRN(1,3)
Sf-Rn	Bi-214	1.50E-11	1.50E-11	SLPFRN(1,4)
Sf-Rn	Radon K factors, (mrem/WLM):			
Sf-Rn	Rn-222 Indoor	3.88E+02	3.88E+02	KFACTR(1,1)
Sf-Rn	Rn-222 Outdoor	3.88E+02	3.88E+02	KFACTR(1,2)

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

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Risk Slope and Environmental Transport Factors for the Ground Pathway

Nuclide	Slope(i)*	ETFG(i,t) At Time in Years (dimensionless)							
(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
Ac-227	3.480E-10	6.833E-02	6.833E-02	6.832E-02	6.832E-02	6.829E-02	6.819E-02	6.781E-02	6.444E-02
At-218	3.570E-09	6.914E-02	6.914E-02	6.914E-02	6.915E-02	6.916E-02	6.920E-02	6.931E-02	6.957E-02
Bi-210	2.760E-09	6.836E-02	6.836E-02	6.835E-02	6.835E-02	6.832E-02	6.821E-02	6.784E-02	6.515E-02
Bi-211	1.880E-07	6.575E-02	6.575E-02	6.574E-02	6.571E-02	6.563E-02	6.533E-02	6.431E-02	5.806E-02
Bi-214	7.480E-06	6.051E-02	6.051E-02	6.049E-02	6.044E-02	6.030E-02	5.979E-02	5.815E-02	4.988E-02
Fr-223	1.400E-07	6.738E-02	6.738E-02	6.738E-02	6.736E-02	6.732E-02	6.714E-02	6.653E-02	6.208E-02
Pa-231	1.390E-07	6.634E-02	6.633E-02	6.633E-02	6.630E-02	6.623E-02	6.596E-02	6.503E-02	5.915E-02
Pa-234	8.710E-06	6.279E-02	6.278E-02	6.277E-02	6.273E-02	6.261E-02	6.217E-02	6.075E-02	5.312E-02
Pa-234m	6.870E-08	6.396E-02	6.395E-02	6.394E-02	6.391E-02	6.381E-02	6.344E-02	6.225E-02	5.580E-02
Pb-210	1.410E-09	6.984E-02	6.984E-02	6.984E-02	6.984E-02	6.985E-02	6.986E-02	6.990E-02	7.001E-02
Pb-211	2.290E-07	6.392E-02	6.391E-02	6.390E-02	6.387E-02	6.376E-02	6.336E-02	6.207E-02	5.483E-02
Pb-214	9.820E-07	6.576E-02	6.576E-02	6.575E-02	6.572E-02	6.564E-02	6.534E-02	6.433E-02	5.812E-02
Po-210	3.950E-11	6.270E-02	6.270E-02	6.268E-02	6.264E-02	6.252E-02	6.208E-02	6.065E-02	5.299E-02
Po-211	3.580E-08	6.303E-02	6.302E-02	6.301E-02	6.297E-02	6.286E-02	6.243E-02	6.105E-02	5.355E-02
Po-214	3.860E-10	6.284E-02	6.283E-02	6.282E-02	6.278E-02	6.266E-02	6.223E-02	6.083E-02	5.327E-02
Po-215	7.480E-10	6.490E-02	6.490E-02	6.489E-02	6.485E-02	6.476E-02	6.441E-02	6.326E-02	5.652E-02
Po-218	4.260E-11	6.267E-02	6.267E-02	6.265E-02	6.261E-02	6.249E-02	6.205E-02	6.061E-02	5.291E-02
Ra-223	4.340E-07	6.729E-02	6.729E-02	6.728E-02	6.727E-02	6.721E-02	6.702E-02	6.632E-02	6.146E-02
Ra-226	2.290E-08	6.737E-02	6.737E-02	6.736E-02	6.735E-02	6.730E-02	6.711E-02	6.645E-02	6.169E-02
Rn-219	2.250E-07	6.568E-02	6.568E-02	6.567E-02	6.564E-02	6.556E-02	6.525E-02	6.422E-02	5.791E-02
Rn-222	1.740E-09	6.465E-02	6.464E-02	6.463E-02	6.460E-02	6.450E-02	6.414E-02	6.294E-02	5.601E-02
Th-227	3.780E-07	6.673E-02	6.673E-02	6.672E-02	6.670E-02	6.664E-02	6.641E-02	6.560E-02	6.019E-02
Th-230	8.190E-10	6.867E-02	6.867E-02	6.867E-02	6.867E-02	6.866E-02	6.863E-02	6.845E-02	6.632E-02
Th-231	2.450E-08	6.887E-02	6.887E-02	6.887E-02	6.887E-02	6.887E-02	6.884E-02	6.870E-02	6.678E-02
Th-234	1.630E-08	6.888E-02	6.888E-02	6.888E-02	6.888E-02	6.888E-02	6.887E-02	6.879E-02	6.726E-02
Tl-207	1.520E-08	6.539E-02	6.539E-02	6.538E-02	6.535E-02	6.527E-02	6.497E-02	6.400E-02	5.841E-02
Tl-210	0.000E+00	6.230E-02	6.229E-02	6.228E-02	6.223E-02	6.209E-02	6.157E-02	5.993E-02	5.157E-02
U-234	2.520E-10	6.914E-02	6.914E-02	6.914E-02	6.914E-02	6.913E-02	6.911E-02	6.899E-02	6.737E-02
U-235	5.180E-07	6.747E-02	6.747E-02	6.747E-02	6.745E-02	6.740E-02	6.722E-02	6.658E-02	6.192E-02
U-238	4.990E-11	7.045E-02	7.045E-02	7.045E-02	7.045E-02	7.046E-02	7.046E-02	7.048E-02	7.052E-02

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

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

	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Radio-Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	8.952E-03	0.000E+00	0.000E+00	0.000E+00	4.694E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.694E+00
Pa-231	8.952E-03	0.000E+00	0.000E+00	0.000E+00	4.694E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.694E+00
Pb-210	8.952E-03	0.000E+00	0.000E+00	0.000E+00	4.694E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.694E+00
Ra-226	8.952E-03	0.000E+00	0.000E+00	0.000E+00	4.694E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.694E+00
Th-230	8.952E-03	0.000E+00	0.000E+00	0.000E+00	4.694E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.694E+00
U-234	8.952E-03	0.000E+00	0.000E+00	0.000E+00	4.694E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.694E+00
U-235	8.952E-03	0.000E+00	0.000E+00	0.000E+00	4.694E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.694E+00
U-238	8.952E-03	0.000E+00	0.000E+00	0.000E+00	4.695E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.695E+00

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.233E-06	0.0782	2.412E-08	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.880E-08	0.0025
Pa-231	1.641E-07	0.0104	1.209E-08	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.880E-08	0.0012
Pb-210	7.190E-09	0.0005	6.801E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.993E-07	0.0253
Ra-226	1.295E-05	0.8215	6.292E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.008E-08	0.0038
Th-230	1.400E-09	0.0001	7.540E-09	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.384E-08	0.0009
U-234	3.102E-10	0.0000	4.411E-09	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.946E-09	0.0005
U-235	6.520E-07	0.0414	3.967E-09	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.124E-09	0.0005
U-238	1.301E-07	0.0083	3.749E-09	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.004E-08	0.0006
Total	1.514E-05	0.9603	6.897E-08	0.0044	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.569E-07	0.0353

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

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.296E-06	0.0822
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.949E-07	0.0124
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.133E-07	0.0262
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.301E-05	0.8257
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.278E-08	0.0014
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.267E-08	0.0008
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.641E-07	0.0421
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.439E-07	0.0091
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.576E-05	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Industrial Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground risk	Ground fract.	Inhalation risk	Inhalation fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	Soil risk	Soil fract.
Ac-227	8.661E-07	0.0550	1.696E-08	0.0011	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.728E-08	0.0017
Pa-231	5.306E-07	0.0337	1.925E-08	0.0012	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.032E-08	0.0019
Pb-210	4.996E-09	0.0003	4.729E-09	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.776E-07	0.0176
Ra-226	1.288E-05	0.8172	8.323E-09	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.810E-07	0.0115
Th-230	7.106E-08	0.0045	7.581E-09	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.463E-08	0.0009
U-234	3.147E-10	0.0000	4.411E-09	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.947E-09	0.0005
U-235	6.521E-07	0.0414	3.971E-09	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.130E-09	0.0005
U-238	1.301E-07	0.0083	3.749E-09	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.004E-08	0.0006
Total	1.514E-05	0.9603	6.897E-08	0.0044	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.569E-07	0.0353

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

Water Dependent Pathways

Radio-Nuclide	Water risk	Water fract.	Fish risk	Fish fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	All pathways risk	All pathways fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.104E-07	0.0578
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.802E-07	0.0368
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.873E-07	0.0182
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.307E-05	0.8292
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.327E-08	0.0059
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.267E-08	0.0008
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.642E-07	0.0421
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.439E-07	0.0091
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.576E-05	1.0000

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

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

	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Radio-Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	8.334E-03	0.000E+00	0.000E+00	0.000E+00	4.371E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.371E+00
Pa-231	8.693E-03	0.000E+00	0.000E+00	0.000E+00	4.559E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.559E+00
Pb-210	8.942E-03	0.000E+00	0.000E+00	0.000E+00	4.689E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.689E+00
Ra-226	8.948E-03	0.000E+00	0.000E+00	0.000E+00	4.692E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.692E+00
Th-230	8.945E-03	0.000E+00	0.000E+00	0.000E+00	4.691E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.691E+00
U-234	8.693E-03	0.000E+00	0.000E+00	0.000E+00	4.559E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.559E+00
U-235	8.693E-03	0.000E+00	0.000E+00	0.000E+00	4.559E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.559E+00
U-238	8.693E-03	0.000E+00	0.000E+00	0.000E+00	4.559E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.559E+00

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.163E-06	0.0743	2.274E-08	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.659E-08	0.0023
Pa-231	1.594E-07	0.0102	1.174E-08	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.826E-08	0.0012
Pb-210	7.186E-09	0.0005	6.795E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.990E-07	0.0255
Ra-226	1.295E-05	0.8269	6.289E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.005E-08	0.0038
Th-230	1.400E-09	0.0001	7.535E-09	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.383E-08	0.0009
U-234	3.013E-10	0.0000	4.283E-09	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.717E-09	0.0005
U-235	6.334E-07	0.0405	3.852E-09	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.889E-09	0.0005
U-238	1.264E-07	0.0081	3.641E-09	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.745E-09	0.0006
Total	1.504E-05	0.9604	6.688E-08	0.0043	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.530E-07	0.0353

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Industrial Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.222E-06	0.0781
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.894E-07	0.0121
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.129E-07	0.0264
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.301E-05	0.8311
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.276E-08	0.0015
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.230E-08	0.0008
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.451E-07	0.0412
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.398E-07	0.0089
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.566E-05	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Industrial Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	7.808E-07	0.0499	1.528E-08	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.459E-08	0.0016
Pa-231	5.413E-07	0.0346	1.920E-08	0.0012	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.026E-08	0.0019
Pb-210	4.839E-09	0.0003	4.579E-09	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.688E-07	0.0172
Ra-226	1.287E-05	0.8222	8.460E-09	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.893E-07	0.0121
Th-230	7.661E-08	0.0049	7.579E-09	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.470E-08	0.0009
U-234	3.064E-10	0.0000	4.284E-09	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.718E-09	0.0005
U-235	6.335E-07	0.0405	3.856E-09	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.896E-09	0.0005
U-238	1.264E-07	0.0081	3.641E-09	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.746E-09	0.0006
Total	1.504E-05	0.9604	6.688E-08	0.0043	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.530E-07	0.0353

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.207E-07	0.0524
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.907E-07	0.0377
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.782E-07	0.0178
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.307E-05	0.8348
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.888E-08	0.0063
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.231E-08	0.0008
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.453E-07	0.0412
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.398E-07	0.0089
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.566E-05	1.0000

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

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

	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Radio-Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	7.253E-03	0.000E+00	0.000E+00	0.000E+00	3.804E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.804E+00
Pa-231	8.198E-03	0.000E+00	0.000E+00	0.000E+00	4.300E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.300E+00
Pb-210	8.923E-03	0.000E+00	0.000E+00	0.000E+00	4.680E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.680E+00
Ra-226	8.940E-03	0.000E+00	0.000E+00	0.000E+00	4.688E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.688E+00
Th-230	8.932E-03	0.000E+00	0.000E+00	0.000E+00	4.684E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.684E+00
U-234	8.198E-03	0.000E+00	0.000E+00	0.000E+00	4.300E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.300E+00
U-235	8.198E-03	0.000E+00	0.000E+00	0.000E+00	4.300E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.300E+00
U-238	8.198E-03	0.000E+00	0.000E+00	0.000E+00	4.300E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.300E+00

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.039E-06	0.0672	2.030E-08	0.0013	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.266E-08	0.0021
Pa-231	1.504E-07	0.0097	1.107E-08	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.722E-08	0.0011
Pb-210	7.179E-09	0.0005	6.784E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.983E-07	0.0258
Ra-226	1.294E-05	0.8368	6.284E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.000E-08	0.0039
Th-230	1.399E-09	0.0001	7.524E-09	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.381E-08	0.0009
U-234	2.844E-10	0.0000	4.039E-09	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.277E-09	0.0005
U-235	5.978E-07	0.0387	3.633E-09	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.440E-09	0.0005
U-238	1.193E-07	0.0077	3.434E-09	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.191E-09	0.0006
Total	1.486E-05	0.9606	6.307E-08	0.0041	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.459E-07	0.0353

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Industrial Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.092E-06	0.0706
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.787E-07	0.0116
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.122E-07	0.0267
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.301E-05	0.8411
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.273E-08	0.0015
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.160E-08	0.0008
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.089E-07	0.0394
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.319E-07	0.0085
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.547E-05	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Industrial Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	6.346E-07	0.0410	1.241E-08	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.997E-08	0.0013
Pa-231	5.544E-07	0.0358	1.896E-08	0.0012	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.990E-08	0.0019
Pb-210	4.541E-09	0.0003	4.293E-09	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.521E-07	0.0163
Ra-226	1.286E-05	0.8314	8.721E-09	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.052E-07	0.0133
Th-230	8.768E-08	0.0057	7.576E-09	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.484E-08	0.0010
U-234	2.906E-10	0.0000	4.040E-09	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.279E-09	0.0005
U-235	5.979E-07	0.0387	3.638E-09	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.448E-09	0.0005
U-238	1.193E-07	0.0077	3.434E-09	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.191E-09	0.0006
Total	1.486E-05	0.9606	6.307E-08	0.0041	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.459E-07	0.0353

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.670E-07	0.0431
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.033E-07	0.0390
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.609E-07	0.0169
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.307E-05	0.8452
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.101E-07	0.0071
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.161E-08	0.0008
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.090E-07	0.0394
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.319E-07	0.0085
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.547E-05	1.0000

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

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

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	4.661E-03	0.000E+00	0.000E+00	0.000E+00	2.444E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.444E+00
Pa-231	6.678E-03	0.000E+00	0.000E+00	0.000E+00	3.502E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.502E+00
Pb-210	8.862E-03	0.000E+00	0.000E+00	0.000E+00	4.648E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.648E+00
Ra-226	8.912E-03	0.000E+00	0.000E+00	0.000E+00	4.674E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.674E+00
Th-230	8.887E-03	0.000E+00	0.000E+00	0.000E+00	4.661E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.661E+00
U-234	6.678E-03	0.000E+00	0.000E+00	0.000E+00	3.502E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.502E+00
U-235	6.678E-03	0.000E+00	0.000E+00	0.000E+00	3.502E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.502E+00
U-238	6.678E-03	0.000E+00	0.000E+00	0.000E+00	3.502E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.502E+00

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	7.270E-07	0.0486	1.417E-08	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.280E-08	0.0015
Pa-231	1.228E-07	0.0082	9.019E-09	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.403E-08	0.0009
Pb-210	7.158E-09	0.0005	6.745E-09	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.960E-07	0.0265
Ra-226	1.293E-05	0.8647	6.264E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.982E-08	0.0040
Th-230	1.396E-09	0.0001	7.485E-09	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.374E-08	0.0009
U-234	2.323E-10	0.0000	3.290E-09	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.928E-09	0.0004
U-235	4.882E-07	0.0327	2.959E-09	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.061E-09	0.0004
U-238	9.739E-08	0.0065	2.797E-09	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.487E-09	0.0005
Total	1.437E-05	0.9613	5.273E-08	0.0035	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.259E-07	0.0352

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Industrial Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.640E-07	0.0511
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.459E-07	0.0098
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.099E-07	0.0274
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.299E-05	0.8691
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.262E-08	0.0015
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.451E-09	0.0006
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.972E-07	0.0333
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.077E-07	0.0072
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.495E-05	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Industrial Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground risk	Ground fract.	Inhalation risk	Inhalation fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	Soil risk	Soil fract.
Ac-227	3.071E-07	0.0205	5.992E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.640E-09	0.0006
Pa-231	5.425E-07	0.0363	1.719E-08	0.0011	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.718E-08	0.0018
Pb-210	3.635E-09	0.0002	3.428E-09	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.012E-07	0.0135
Ra-226	1.281E-05	0.8566	9.502E-09	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.529E-07	0.0169
Th-230	1.263E-07	0.0084	7.564E-09	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.546E-08	0.0010
U-234	2.435E-10	0.0000	3.291E-09	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.930E-09	0.0004
U-235	4.884E-07	0.0327	2.966E-09	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.071E-09	0.0004
U-238	9.739E-08	0.0065	2.797E-09	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.487E-09	0.0005
Total	1.437E-05	0.9613	5.273E-08	0.0035	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.259E-07	0.0352

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

Water Dependent Pathways

Radio-Nuclide	Water risk	Water fract.	Fish risk	Fish fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	All pathways risk	All pathways fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.228E-07	0.0216
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.869E-07	0.0393
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.083E-07	0.0139
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.307E-05	0.8741
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.493E-07	0.0100
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.464E-09	0.0006
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.974E-07	0.0333
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.077E-07	0.0072
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.495E-05	1.0000

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

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 3.000E+01 years

	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways				
Radio-Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.810E-03	0.000E+00	0.000E+00	0.000E+00	9.493E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.493E-01
Pa-231	3.717E-03	0.000E+00	0.000E+00	0.000E+00	1.949E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.949E+00
Pb-210	8.722E-03	0.000E+00	0.000E+00	0.000E+00	4.574E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.574E+00
Ra-226	8.833E-03	0.000E+00	0.000E+00	0.000E+00	4.633E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.633E+00
Th-230	8.758E-03	0.000E+00	0.000E+00	0.000E+00	4.593E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.593E+00
U-234	3.717E-03	0.000E+00	0.000E+00	0.000E+00	1.949E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.949E+00
U-235	3.717E-03	0.000E+00	0.000E+00	0.000E+00	1.949E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.949E+00
U-238	3.717E-03	0.000E+00	0.000E+00	0.000E+00	1.949E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.949E+00

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

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 3.000E+01 years

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

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

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	3.308E-07	0.0234	6.403E-09	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.030E-08	0.0007
Pa-231	6.883E-08	0.0049	5.019E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.807E-09	0.0006
Pb-210	7.116E-09	0.0005	6.652E-09	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.906E-07	0.0276
Ra-226	1.289E-05	0.9106	6.208E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.928E-08	0.0042
Th-230	1.386E-09	0.0001	7.377E-09	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.354E-08	0.0010
U-234	1.303E-10	0.0000	1.831E-09	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.299E-09	0.0002
U-235	2.737E-07	0.0193	1.647E-09	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.373E-09	0.0002
U-238	5.456E-08	0.0039	1.557E-09	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.166E-09	0.0003
Total	1.363E-05	0.9626	3.669E-08	0.0026	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.923E-07	0.0348

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Industrial Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.475E-07	0.0246
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.165E-08	0.0058
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.043E-07	0.0286
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.295E-05	0.9152
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.230E-08	0.0016
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.261E-09	0.0004
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.787E-07	0.0197
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.028E-08	0.0043
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.415E-05	1.0000

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

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+01 years

Radionuclides

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

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

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Industrial Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	3.862E-08	0.0027	7.482E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.204E-09	0.0001
Pa-231	3.608E-07	0.0255	1.067E-08	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.689E-08	0.0012
Pb-210	1.925E-09	0.0001	1.801E-09	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.057E-07	0.0075
Ra-226	1.266E-05	0.8944	1.089E-08	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.398E-07	0.0240
Th-230	2.350E-07	0.0166	7.542E-09	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.783E-08	0.0013
U-234	1.620E-10	0.0000	1.833E-09	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.302E-09	0.0002
U-235	2.740E-07	0.0194	1.655E-09	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.385E-09	0.0002
U-238	5.456E-08	0.0039	1.557E-09	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.167E-09	0.0003
Total	1.363E-05	0.9626	3.669E-08	0.0026	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.923E-07	0.0348

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.057E-08	0.0029
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.883E-07	0.0274
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.095E-07	0.0077
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.301E-05	0.9192
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.604E-07	0.0184
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.297E-09	0.0004
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.790E-07	0.0197
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.028E-08	0.0043
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.415E-05	1.0000

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

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

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	2.037E-04	0.000E+00	0.000E+00	0.000E+00	1.068E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.068E-01
Pa-231	4.777E-04	0.000E+00	0.000E+00	0.000E+00	2.505E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.505E-01
Pb-210	8.389E-03	0.000E+00	0.000E+00	0.000E+00	4.400E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.400E+00
Ra-226	8.555E-03	0.000E+00	0.000E+00	0.000E+00	4.487E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.487E+00
Th-230	8.316E-03	0.000E+00	0.000E+00	0.000E+00	4.361E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.361E+00
U-234	4.777E-04	0.000E+00	0.000E+00	0.000E+00	2.505E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.505E-01
U-235	4.777E-04	0.000E+00	0.000E+00	0.000E+00	2.505E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.505E-01
U-238	4.777E-04	0.000E+00	0.000E+00	0.000E+00	2.505E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.505E-01

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	4.068E-08	0.0031	7.680E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.235E-09	0.0001
Pa-231	9.067E-09	0.0007	6.451E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.003E-09	0.0001
Pb-210	7.051E-09	0.0005	6.411E-09	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.764E-07	0.0283
Ra-226	1.274E-05	0.9569	6.011E-09	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.740E-08	0.0043
Th-230	1.354E-09	0.0001	7.003E-09	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.285E-08	0.0010
U-234	1.723E-11	0.0000	2.353E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.240E-10	0.0000
U-235	3.611E-08	0.0027	2.116E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.335E-10	0.0000
U-238	7.180E-09	0.0005	2.000E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.355E-10	0.0000
Total	1.284E-05	0.9646	2.149E-08	0.0016	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.503E-07	0.0338

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Industrial Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.268E-08	0.0032
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.072E-08	0.0008
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.899E-07	0.0293
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.281E-05	0.9617
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.121E-08	0.0016
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.766E-10	0.0001
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.676E-08	0.0028
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.915E-09	0.0006
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.331E-05	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Industrial Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground risk	Ground fract.	Inhalation risk	Inhalation fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	Soil risk	Soil fract.
Ac-227	2.721E-11	0.0000	5.143E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.275E-13	0.0000
Pa-231	4.961E-08	0.0037	1.409E-09	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.233E-09	0.0002
Pb-210	2.080E-10	0.0000	1.892E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.111E-08	0.0008
Ra-226	1.215E-05	0.9126	1.173E-08	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.071E-07	0.0306
Th-230	5.980E-07	0.0449	7.502E-09	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.845E-08	0.0021
U-234	1.497E-10	0.0000	2.375E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.309E-10	0.0000
U-235	3.622E-08	0.0027	2.147E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.384E-10	0.0000
U-238	7.180E-09	0.0005	2.001E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.356E-10	0.0000
Total	1.284E-05	0.9646	2.149E-08	0.0016	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.503E-07	0.0338

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

Water Dependent Pathways

Radio-Nuclide	Water risk	Water fract.	Fish risk	Fish fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	All pathways risk	All pathways fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.855E-11	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.325E-08	0.0040
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.151E-08	0.0009
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.257E-05	0.9441
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.340E-07	0.0476
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.181E-10	0.0001
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.687E-08	0.0028
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.915E-09	0.0006
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.331E-05	1.0000

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

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

	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways				
Radio-Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	5.766E-07	0.000E+00	0.000E+00	0.000E+00	3.024E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.024E-04
Pa-231	1.353E-06	0.000E+00	0.000E+00	0.000E+00	7.097E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.097E-04
Pb-210	7.595E-03	0.000E+00	0.000E+00	0.000E+00	3.983E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.983E+00
Ra-226	7.746E-03	0.000E+00	0.000E+00	0.000E+00	4.063E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.063E+00
Th-230	7.134E-03	0.000E+00	0.000E+00	0.000E+00	3.741E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.741E+00
U-234	1.353E-06	0.000E+00	0.000E+00	0.000E+00	7.097E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.097E-04
U-235	1.353E-06	0.000E+00	0.000E+00	0.000E+00	7.097E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.097E-04
U-238	1.353E-06	0.000E+00	0.000E+00	0.000E+00	7.097E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.097E-04

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.239E-10	0.0000	2.174E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.497E-12	0.0000
Pa-231	2.762E-11	0.0000	1.827E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.841E-12	0.0000
Pb-210	6.938E-09	0.0005	5.801E-09	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.406E-07	0.0269
Ra-226	1.225E-05	0.9662	5.439E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.194E-08	0.0041
Th-230	1.264E-09	0.0001	6.005E-09	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.102E-08	0.0009
U-234	5.317E-14	0.0000	6.664E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.201E-12	0.0000
U-235	1.106E-10	0.0000	5.993E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.227E-12	0.0000
U-238	2.181E-11	0.0000	5.665E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.516E-12	0.0000
Total	1.226E-05	0.9668	1.725E-08	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.035E-07	0.0318

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

Water Dependent Pathways

	Water		Fish		Plant		Meat		Milk		All Pathways**	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.296E-10	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.229E-11	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.533E-07	0.0279
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.231E-05	0.9707
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.829E-08	0.0014
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.920E-12	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.124E-10	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.389E-11	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.268E-05	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Industrial Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.679E-20	0.0000	4.706E-22	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.571E-22	0.0000
Pa-231	1.506E-10	0.0000	3.975E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.298E-12	0.0000
Pb-210	3.603E-13	0.0000	3.014E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.770E-11	0.0000
Ra-226	1.077E-05	0.8492	9.938E-09	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.486E-07	0.0275
Th-230	1.491E-06	0.1176	7.304E-09	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.489E-08	0.0043
U-234	4.183E-10	0.0000	2.919E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.682E-11	0.0000
U-235	1.115E-10	0.0000	6.250E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.268E-12	0.0000
U-238	2.184E-11	0.0000	5.673E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.519E-12	0.0000
Total	1.226E-05	0.9668	1.725E-08	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.035E-07	0.0318

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.802E-20	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.608E-10	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.836E-11	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.113E-05	0.8774
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.554E-06	0.1225
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.380E-10	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.134E-10	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.393E-11	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.268E-05	1.0000

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

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

	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways				
Radio-Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	6.450E-16	0.000E+00	0.000E+00	0.000E+00	3.383E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.383E-13
Pa-231	1.514E-15	0.000E+00	0.000E+00	0.000E+00	7.940E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.940E-13
Pb-210	4.824E-03	0.000E+00	0.000E+00	0.000E+00	2.530E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.530E+00
Ra-226	4.911E-03	0.000E+00	0.000E+00	0.000E+00	2.576E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.576E+00
Th-230	3.857E-03	0.000E+00	0.000E+00	0.000E+00	2.023E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.023E+00
U-234	1.514E-15	0.000E+00	0.000E+00	0.000E+00	7.940E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.940E-13
U-235	1.514E-15	0.000E+00	0.000E+00	0.000E+00	7.940E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.940E-13
U-238	1.514E-15	0.000E+00	0.000E+00	0.000E+00	7.940E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.940E-13

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.849E-19	0.0000	2.426E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.903E-21	0.0000
Pa-231	4.116E-20	0.0000	2.039E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.171E-21	0.0000
Pb-210	6.286E-09	0.0006	3.672E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.156E-07	0.0214
Ra-226	9.815E-06	0.9730	3.437E-09	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.282E-08	0.0033
Th-230	9.700E-10	0.0001	3.238E-09	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.943E-09	0.0006
U-234	8.514E-23	0.0000	7.438E-22	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.340E-21	0.0000
U-235	1.689E-19	0.0000	6.689E-22	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.370E-21	0.0000
U-238	3.230E-20	0.0000	6.323E-22	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.692E-21	0.0000
Total	9.823E-06	0.9738	1.035E-08	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.544E-07	0.0252

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Industrial Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.912E-19	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.637E-20	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.256E-07	0.0224
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.852E-06	0.9766
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.015E-08	0.0010
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.169E-21	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.709E-19	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.462E-20	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.009E-05	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Industrial Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground risk	Ground fract.	Inhalation risk	Inhalation fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	Soil risk	Soil fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pa-231	2.213E-19	0.0000	4.371E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.926E-21	0.0000
Pb-210	7.682E-23	0.0000	4.492E-23	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.637E-21	0.0000
Ra-226	6.675E-06	0.6617	4.859E-09	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.704E-07	0.0169
Th-230	3.146E-06	0.3119	5.486E-09	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.390E-08	0.0083
U-234	9.594E-10	0.0001	1.705E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.562E-11	0.0000
U-235	1.736E-19	0.0000	7.628E-22	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.519E-21	0.0000
U-238	9.201E-14	0.0000	1.669E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.461E-15	0.0000
Total	9.823E-06	0.9738	1.035E-08	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.544E-07	0.0252

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

Water Dependent Pathways

Radio-Nuclide	Water risk	Water fract.	Fish risk	Fish fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	All pathways risk	All pathways fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.326E-19	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.759E-21	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.851E-06	0.6791
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.236E-06	0.3208
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.867E-10	0.0001
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.759E-19	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.464E-14	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.009E-05	1.0000

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

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Industrial Worker
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Part I: Mixture Sums and Single Radionuclide Guidelines

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Industrial Worker
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Dose Conversion Factor (and Related) Parameter Summary
Dose Library: ICRP 72 (Adult)

Menu	Parameter	Current Value#	Base Case*	Parameter Name
A-1	DCF's for external ground radiation, (mrem/yr)/(pCi/g)			
A-1	Ac-227 (Source: ICRP 60)	4.485E-04	4.485E-04	DCF1(1)
A-1	At-218 (Source: ICRP 60)	4.878E-03	4.878E-03	DCF1(2)
A-1	Bi-210 (Source: ICRP 60)	5.476E-03	5.476E-03	DCF1(3)
A-1	Bi-211 (Source: ICRP 60)	2.373E-01	2.373E-01	DCF1(4)
A-1	Bi-214 (Source: ICRP 60)	9.325E+00	9.325E+00	DCF1(5)
A-1	Fr-223 (Source: ICRP 60)	1.813E-01	1.813E-01	DCF1(6)
A-1	Pa-231 (Source: ICRP 60)	1.762E-01	1.762E-01	DCF1(7)
A-1	Pa-234 (Source: ICRP 60)	1.088E+01	1.088E+01	DCF1(8)
A-1	Pa-234m (Source: ICRP 60)	9.867E-02	9.867E-02	DCF1(9)
A-1	Pb-210 (Source: ICRP 60)	1.981E-03	1.981E-03	DCF1(10)
A-1	Pb-211 (Source: ICRP 60)	2.915E-01	2.915E-01	DCF1(11)
A-1	Pb-214 (Source: ICRP 60)	1.243E+00	1.243E+00	DCF1(12)
A-1	Po-210 (Source: ICRP 60)	4.934E-05	4.934E-05	DCF1(13)
A-1	Po-211 (Source: ICRP 60)	4.485E-02	4.485E-02	DCF1(14)
A-1	Po-214 (Source: ICRP 60)	4.840E-04	4.840E-04	DCF1(15)
A-1	Po-215 (Source: ICRP 60)	9.456E-04	9.456E-04	DCF1(16)
A-1	Po-218 (Source: ICRP 60)	5.326E-05	5.326E-05	DCF1(17)
A-1	Ra-223 (Source: ICRP 60)	5.532E-01	5.532E-01	DCF1(18)
A-1	Ra-226 (Source: ICRP 60)	2.915E-02	2.915E-02	DCF1(19)
A-1	Rn-219 (Source: ICRP 60)	2.859E-01	2.859E-01	DCF1(20)
A-1	Rn-222 (Source: ICRP 60)	2.186E-03	2.186E-03	DCF1(21)
A-1	Th-227 (Source: ICRP 60)	4.803E-01	4.803E-01	DCF1(22)
A-1	Th-230 (Source: ICRP 60)	1.071E-03	1.071E-03	DCF1(23)
A-1	Th-231 (Source: ICRP 60)	3.214E-02	3.214E-02	DCF1(24)
A-1	Th-234 (Source: ICRP 60)	2.130E-02	2.130E-02	DCF1(25)
A-1	Tl-207 (Source: ICRP 60)	2.299E-02	2.299E-02	DCF1(26)
A-1	Tl-210 (Source: ICRP 60)	1.661E+01	1.661E+01	DCF1(27)
A-1	U-234 (Source: ICRP 60)	3.439E-04	3.439E-04	DCF1(28)
A-1	U-235 (Source: ICRP 60)	6.597E-01	6.597E-01	DCF1(29)
A-1	U-238 (Source: ICRP 60)	7.961E-05	7.961E-05	DCF1(30)
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	2.104E+00	2.035E+00	DCF2(1)
B-1	Pa-231	5.180E-01	5.180E-01	DCF2(2)
B-1	Pb-210+D	3.697E-02	2.072E-02	DCF2(3)
B-1	Ra-226+D	3.526E-02	3.515E-02	DCF2(4)
B-1	Th-230	3.700E-01	3.700E-01	DCF2(5)
B-1	U-234	3.478E-02	3.478E-02	DCF2(6)
B-1	U-235+D	3.145E-02	3.145E-02	DCF2(7)
B-1	U-238	2.960E-02	2.960E-02	DCF2(8)
B-1	U-238+D	2.963E-02	2.960E-02	DCF2(9)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	4.473E-03	4.070E-03	DCF3(1)
D-1	Pa-231	2.627E-03	2.627E-03	DCF3(2)
D-1	Pb-210+D	6.998E-03	2.553E-03	DCF3(3)
D-1	Ra-226+D	1.037E-03	1.036E-03	DCF3(4)
D-1	Th-230	7.770E-04	7.770E-04	DCF3(5)
D-1	U-234	1.813E-04	1.813E-04	DCF3(6)

Dose Conversion Factor (and Related) Parameter Summary (continued)
Dose Library: ICRP 72 (Adult)

Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-1	U-235+D	1.752E-04	1.739E-04	DCF3(7)
D-1	U-238	1.665E-04	1.665E-04	DCF3(8)
D-1	U-238+D	1.791E-04	1.665E-04	DCF3(9)
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	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(2,1)
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(2,2)
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(2,3)
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(3,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(3,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(3,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(4,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(4,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(4,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(5,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(5,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(5,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(6,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(6,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(6,3)
D-34				
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(7,1)
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(7,2)
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(7,3)
D-34				
D-34	U-238 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(8,1)
D-34	U-238 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(8,2)
D-34	U-238 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(8,3)
D-34				
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(9,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(9,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(9,3)
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	Pa-231 , fish	1.000E+01	1.000E+01	BIOFAC(2,1)
D-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(2,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(3,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(3,2)

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Industrial Worker

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Dose Conversion Factor (and Related) Parameter Summary (continued)

Dose Library: ICRP 72 (Adult)

Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(4,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(4,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(5,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(5,2)
D-5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(6,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(6,2)
D-5				
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIOFAC(7,1)
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(7,2)
D-5				
D-5	U-238 , fish	1.000E+01	1.000E+01	BIOFAC(8,1)
D-5	U-238 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(8,2)
D-5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(9,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(9,2)

#For DCF1(xxx) only, factors are for infinite depth & area. See ETFG table in Ground Pathway of Detailed Report.

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

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Site-Specific Parameter Summary

Menu	Parameter	User Input	Used by RESRAD Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.620E+04	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	1.370E+00	2.000E+00	---	THICK0
R011	Fraction of contamination that is submerged	0.000E+00	0.000E+00	---	SUBMFRACT
R011	Length parallel to aquifer flow (m)	not used	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Ac-227	1.000E+00	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g): Pa-231	1.000E+00	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Pb-210	1.000E+00	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): Ra-226	1.000E+00	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Th-230	1.000E+00	0.000E+00	---	S1(5)
R012	Initial principal radionuclide (pCi/g): U-234	1.000E+00	0.000E+00	---	S1(6)
R012	Initial principal radionuclide (pCi/g): U-235	1.000E+00	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): U-238	1.000E+00	0.000E+00	---	S1(8)
R012	Concentration in groundwater (pCi/L): Ac-227	not used	0.000E+00	---	W1(1)
R012	Concentration in groundwater (pCi/L): Pa-231	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Pb-210	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	W1(4)
R012	Concentration in groundwater (pCi/L): Th-230	not used	0.000E+00	---	W1(5)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(6)
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	---	W1(7)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(8)
R013	Cover depth (m)	1.500E-01	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	1.700E+00	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	6.000E-05	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.700E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.200E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	3.600E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	6.840E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	1.040E+01	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	4.400E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	9.000E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	4.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	not used	1.000E+06	---	WAREA

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R013	Accuracy for water/soil computations	not used	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	not used	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	not used	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	not used	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	not used	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	not used	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	not used	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	not used	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	not used	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	not used	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	not used	2.500E+02	---	UW
R015	Number of unsaturated zone strata	not used	1	---	NS
R015	Unsat. zone 1, thickness (m)	not used	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	not used	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	not used	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	not used	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	not used	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	not used	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	not used	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Ac-227				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	not used	2.000E+01	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	not used	2.000E+01	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.860E-03	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for Pa-231				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.164E-03	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Pb-210				
R016	Contaminated zone (cm**3/g)	2.100E+03	1.000E+02	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	not used	1.000E+02	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.564E-05	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	3.800E+04	7.000E+01	---	DCNUCC(4)
R016	Unsaturated zone 1 (cm**3/g)	not used	7.000E+01	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.181E-06	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Th-230				
R016	Contaminated zone (cm**3/g)	4.500E+03	6.000E+04	---	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	not used	6.000E+04	---	DCNUCU(5,1)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.530E-05	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(6)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.164E-03	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R016	Distribution coefficients for U-235				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(7)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(7,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.164E-03	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(8)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(8,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.164E-03	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R017	Inhalation rate (m**3/yr)	1.020E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	2.500E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	2.100E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	2.000E-01	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	2.900E-02	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)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	2.050E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	not used	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	not used	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	not used	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	not used	-1	---	FPLANT
R018	Contamination fraction of meat	not used	-1	---	FMEAT
R018	Contamination fraction of milk	not used	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	not used	5.000E-01	---	LSI
R019	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	not used	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	not used	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	not used	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	not used	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	not used	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	not used	8.000E-02	---	TE(3)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	not used	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	not used	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	not used	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
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

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Industrial Worker
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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	257	---	---	KYMAX

Summary of Pathway Selections

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

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Industrial Worker

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Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	16200.00 square meters	Ac-227	1.000E+00
Thickness:	1.37 meters	Pa-231	1.000E+00
Cover Depth:	0.15 meters	Pb-210	1.000E+00
		Ra-226	1.000E+00
		Th-230	1.000E+00
		U-234	1.000E+00
		U-235	1.000E+00
		U-238	1.000E+00

Total Dose TDOSE(t), mrem/yr

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

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

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	9.928E-02	9.935E-02	9.949E-02	1.000E-01	1.016E-01	1.079E-01	1.272E-01	2.199E-01
M(t):	3.971E-03	3.974E-03	3.980E-03	4.000E-03	4.065E-03	4.318E-03	5.087E-03	8.798E-03

Maximum TDOSE(t): 2.199E-01 mrem/yr at t = 1.000E+03 years

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Industrial Worker
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Ac-227	6.194E-03	0.0624	3.668E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.090E-06	0.0000
Pa-231	6.712E-04	0.0068	1.004E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.549E-06	0.0000
Pb-210	6.733E-06	0.0001	6.484E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.435E-06	0.0001
Ra-226	9.024E-02	0.9089	6.446E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.108E-06	0.0000
Th-230	2.011E-05	0.0002	6.624E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.298E-07	0.0000
U-234	1.208E-07	0.0000	6.214E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.699E-07	0.0000
U-235	1.317E-03	0.0133	5.620E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.641E-07	0.0000
U-238	8.098E-04	0.0082	5.293E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.678E-07	0.0000
Total	9.926E-02	0.9998	5.635E-06	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.541E-05	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 = 0.000E+00 years

Water Dependent Pathways

Radio-Nuclide	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.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.202E-03	0.0625
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.747E-04	0.0068
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.323E-05	0.0001
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.025E-02	0.9090
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.150E-05	0.0002
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.528E-07	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.317E-03	0.0133
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.100E-04	0.0082
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.928E-02	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Industrial Worker
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	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.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Ac-227	5.960E-03	0.0600	1.062E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.184E-05	0.0001
Pa-231	8.631E-04	0.0087	3.309E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.966E-06	0.0001
Pb-210	6.535E-06	0.0001	1.892E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.878E-05	0.0002
Ra-226	9.028E-02	0.9087	1.986E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.848E-06	0.0000
Th-230	5.924E-05	0.0006	1.987E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.191E-06	0.0000
U-234	1.210E-07	0.0000	1.859E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.082E-07	0.0000
U-235	1.315E-03	0.0132	1.682E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.912E-07	0.0000
U-238	8.080E-04	0.0081	1.583E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.019E-07	0.0000
Total	9.929E-02	0.9994	1.682E-05	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.613E-05	0.0005

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 mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.983E-03	0.0602
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.744E-04	0.0088
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.550E-05	0.0003
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.028E-02	0.9087
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.342E-05	0.0006
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.151E-07	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.315E-03	0.0132
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.086E-04	0.0081
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.935E-02	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Industrial Worker
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	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.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Ac-227	5.518E-03	0.0555	2.292E-05	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.556E-05	0.0003
Pa-231	1.224E-03	0.0123	9.162E-06	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.013E-05	0.0002
Pb-210	6.157E-06	0.0001	4.152E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.121E-05	0.0004
Ra-226	9.034E-02	0.9081	4.892E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.157E-05	0.0001
Th-230	1.376E-04	0.0014	4.637E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.120E-06	0.0001
U-234	1.225E-07	0.0000	4.312E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.178E-06	0.0000
U-235	1.310E-03	0.0132	3.904E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.140E-06	0.0000
U-238	8.044E-04	0.0081	3.672E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.164E-06	0.0000
Total	9.934E-02	0.9985	3.882E-05	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.071E-04	0.0011

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 mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.567E-03	0.0560
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.253E-03	0.0126
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.778E-05	0.0005
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.036E-02	0.9082
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.474E-04	0.0015
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.732E-06	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.311E-03	0.0132
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.059E-04	0.0081
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.949E-02	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Industrial Worker
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 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.
Ac-227	4.214E-03	0.0421	5.212E-05	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.812E-05	0.0006
Pa-231	2.277E-03	0.0228	4.008E-05	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.378E-05	0.0007
Pb-210	4.998E-06	0.0000	1.002E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.945E-05	0.0010
Ra-226	9.058E-02	0.9058	1.706E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.869E-05	0.0006
Th-230	4.134E-04	0.0041	1.391E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.550E-05	0.0002
U-234	1.388E-07	0.0000	1.266E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.459E-06	0.0000
U-235	1.294E-03	0.0129	1.150E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.355E-06	0.0000
U-238	7.918E-04	0.0079	1.078E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.416E-06	0.0000
Total	9.957E-02	0.9957	1.123E-04	0.0011	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.158E-04	0.0032

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.324E-03	0.0432
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.391E-03	0.0239
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.055E-04	0.0011
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.064E-02	0.9064
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.428E-04	0.0044
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.864E-06	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.299E-03	0.0130
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.963E-04	0.0080
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.000E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Industrial Worker
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	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.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Ac-227	1.950E-03	0.0192	6.846E-05	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.633E-05	0.0008
Pa-231	4.015E-03	0.0395	1.734E-04	0.0017	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.727E-04	0.0027
Pb-210	2.754E-06	0.0000	1.561E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.549E-04	0.0015
Ra-226	9.124E-02	0.8979	6.251E-06	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.020E-04	0.0030
Th-230	1.213E-03	0.0119	4.042E-05	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.708E-05	0.0005
U-234	2.785E-07	0.0000	3.459E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.439E-06	0.0001
U-235	1.251E-03	0.0123	3.198E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.249E-06	0.0001
U-238	7.570E-04	0.0075	2.938E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.314E-06	0.0001
Total	1.004E-01	0.9884	2.997E-04	0.0029	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.810E-04	0.0087

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 mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.094E-03	0.0206
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.461E-03	0.0439
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.593E-04	0.0016
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.155E-02	0.9010
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.301E-03	0.0128
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.318E-05	0.0001
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.263E-03	0.0124
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.693E-04	0.0076
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.016E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Industrial Worker
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	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.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Ac-227	1.314E-04	0.0012	1.401E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.563E-05	0.0001
Pa-231	4.847E-03	0.0449	6.024E-04	0.0056	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.808E-04	0.0082
Pb-210	3.420E-07	0.0000	5.809E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.765E-05	0.0005
Ra-226	9.362E-02	0.8672	2.444E-05	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.408E-03	0.0130
Th-230	4.158E-03	0.0385	1.335E-04	0.0012	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.934E-04	0.0018
U-234	1.817E-06	0.0000	9.207E-06	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.502E-05	0.0002
U-235	1.113E-03	0.0103	9.272E-06	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.565E-05	0.0002
U-238	6.469E-04	0.0060	7.760E-06	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.460E-05	0.0002
Total	1.045E-01	0.9682	8.012E-04	0.0074	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.630E-03	0.0244

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

Water Dependent Pathways

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.610E-04	0.0015
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.330E-03	0.0586
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.858E-05	0.0005
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.505E-02	0.8805
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.485E-03	0.0415
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.604E-05	0.0003
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.148E-03	0.0106
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.793E-04	0.0063
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.079E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Industrial Worker
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	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.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Ac-227	5.912E-08	0.0000	1.494E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.666E-08	0.0000
Pa-231	3.315E-03	0.0261	9.719E-04	0.0076	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.414E-03	0.0111
Pb-210	8.828E-10	0.0000	3.415E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.389E-07	0.0000
Ra-226	1.007E-01	0.7921	6.855E-05	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.016E-03	0.0316
Th-230	1.392E-02	0.1095	4.018E-04	0.0032	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.327E-04	0.0073
U-234	1.442E-05	0.0001	1.515E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.074E-05	0.0003
U-235	7.972E-04	0.0063	1.884E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.672E-05	0.0004
U-238	4.130E-04	0.0032	1.233E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.909E-05	0.0003
Total	1.192E-01	0.9373	1.489E-03	0.0117	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.490E-03	0.0510

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 mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.072E-08	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.701E-03	0.0448
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.432E-07	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.048E-01	0.8242
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.526E-02	0.1200
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.031E-05	0.0006
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.628E-04	0.0068
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.644E-04	0.0037
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.272E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Industrial Worker
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	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.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Ac-227	1.150E-19	0.0000	4.257E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.747E-20	0.0000
Pa-231	8.122E-04	0.0037	3.481E-04	0.0016	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.066E-04	0.0023
Pb-210	7.740E-19	0.0000	3.831E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.803E-16	0.0000
Ra-226	1.306E-01	0.5936	1.681E-04	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.845E-03	0.0448
Th-230	6.934E-02	0.3152	1.355E-03	0.0062	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.447E-03	0.0293
U-234	1.441E-04	0.0007	8.917E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.855E-05	0.0001
U-235	2.451E-04	0.0011	1.204E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.454E-05	0.0001
U-238	8.655E-05	0.0004	4.496E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.425E-05	0.0001
Total	2.012E-01	0.9147	1.897E-03	0.0086	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.687E-02	0.0767

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

Water Dependent Pathways

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.050E-19	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.667E-03	0.0076
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.849E-16	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.406E-01	0.6391
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.714E-02	0.3507
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.816E-04	0.0008
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.816E-04	0.0013
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.053E-04	0.0005
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.199E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Industrial Worker
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Dose/Source Ratios Summed Over All Pathways
Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g) 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-227+D	Ac-227+D	1.000E+00	6.202E-03	5.983E-03	5.567E-03	4.324E-03	2.094E-03	1.610E-04	9.072E-08	2.050E-19
Pa-231	Pa-231	1.000E+00	5.754E-04	5.810E-04	5.921E-04	6.297E-04	7.269E-04	9.646E-04	1.099E-03	3.595E-04
Pa-231	Ac-227+D	1.000E+00	9.933E-05	2.934E-04	6.613E-04	1.761E-03	3.735E-03	5.366E-03	4.602E-03	1.307E-03
Pa-231	äDSR(j)		6.747E-04	8.744E-04	1.253E-03	2.391E-03	4.461E-03	6.330E-03	5.701E-03	1.667E-03
Pb-210+D	Pb-210+D	1.000E+00	1.323E-05	2.550E-05	4.778E-05	1.055E-04	1.593E-04	5.858E-05	3.432E-07	3.849E-16
Ra-226+D	Ra-226+D	1.000E+00	9.024E-02	9.028E-02	9.035E-02	9.060E-02	9.130E-02	9.381E-02	1.013E-01	1.319E-01
Ra-226+D	Pb-210+D	1.000E+00	2.411E-07	1.250E-06	5.520E-06	4.064E-05	2.501E-04	1.240E-03	3.547E-03	8.691E-03
Ra-226+D	äDSR(j)		9.025E-02	9.028E-02	9.036E-02	9.064E-02	9.155E-02	9.505E-02	1.048E-01	1.406E-01
Th-230	Th-230	1.000E+00	1.951E-06	4.735E-06	1.030E-05	2.979E-05	8.538E-05	2.792E-04	8.265E-04	2.668E-03
Th-230	Ra-226+D	1.000E+00	1.955E-05	5.869E-05	1.371E-04	4.130E-04	1.214E-03	4.166E-03	1.400E-02	7.003E-02
Th-230	Pb-210+D	1.000E+00	3.739E-11	4.351E-10	4.316E-09	9.768E-08	1.915E-06	3.970E-05	4.346E-04	4.436E-03
Th-230	äDSR(j)		2.150E-05	6.342E-05	1.474E-04	4.428E-04	1.301E-03	4.485E-03	1.526E-02	7.714E-02
U-234	U-234	1.000E+00	3.528E-07	8.146E-07	1.730E-06	4.842E-06	1.299E-05	3.410E-05	5.404E-05	1.961E-05
U-234	Th-230	1.000E+00	1.086E-11	6.586E-11	3.249E-10	2.772E-09	2.236E-08	2.168E-07	1.450E-06	7.354E-06
U-234	Ra-226+D	1.000E+00	5.863E-11	4.103E-10	2.167E-09	1.933E-08	1.618E-07	1.713E-06	1.441E-05	1.455E-04
U-234	Pb-210+D	1.000E+00	8.757E-17	2.150E-15	4.649E-14	3.142E-12	1.839E-10	1.326E-08	4.142E-07	9.096E-06
U-234	äDSR(j)		3.528E-07	8.151E-07	1.732E-06	4.864E-06	1.318E-05	3.604E-05	7.031E-05	1.816E-04
U-235+D	U-235+D	1.000E+00	1.317E-03	1.315E-03	1.311E-03	1.298E-03	1.261E-03	1.137E-03	8.291E-04	2.467E-04
U-235+D	Pa-231	1.000E+00	6.097E-09	1.845E-08	4.386E-08	1.399E-07	4.692E-07	2.053E-06	7.010E-06	7.691E-06
U-235+D	Ac-227+D	1.000E+00	7.027E-10	4.870E-09	2.518E-08	2.083E-07	1.425E-06	8.606E-06	2.667E-05	2.720E-05
U-235+D	äDSR(j)		1.317E-03	1.315E-03	1.311E-03	1.299E-03	1.263E-03	1.148E-03	8.628E-04	2.816E-04
U-238	U-238	5.400E-05	1.128E-11	3.374E-11	7.825E-11	2.296E-10	6.261E-10	1.653E-09	2.625E-09	9.543E-10
U-238+D	U-238+D	9.999E-01	8.100E-04	8.086E-04	8.059E-04	7.963E-04	7.693E-04	6.793E-04	4.644E-04	1.051E-04
U-238+D	U-234	9.999E-01	6.095E-13	3.573E-12	1.727E-11	1.442E-10	1.124E-09	9.716E-09	4.605E-08	5.570E-08
U-238+D	Th-230	9.999E-01	1.124E-17	1.493E-16	1.630E-15	4.109E-14	9.516E-13	2.927E-11	5.227E-10	5.721E-09
U-238+D	Ra-226+D	9.999E-01	4.153E-17	6.225E-16	7.251E-15	1.911E-13	4.594E-12	1.548E-10	3.530E-09	8.469E-08
U-238+D	Pb-210+D	9.999E-01	5.095E-23	2.570E-21	1.187E-19	2.371E-17	4.094E-15	1.010E-12	9.373E-11	5.204E-09
U-238+D	äDSR(j)		8.100E-04	8.086E-04	8.059E-04	7.963E-04	7.693E-04	6.793E-04	4.644E-04	1.053E-04

The DSR includes contributions from associated (half-life ó 180 days) daughters.

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Industrial Worker
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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
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Ac-227 4.031E+03 4.179E+03 4.491E+03 5.782E+03 1.194E+04 1.553E+05 2.756E+08 *7.232E+13
Pa-231 3.705E+04 2.859E+04 1.994E+04 1.046E+04 5.604E+03 3.949E+03 4.385E+03 1.500E+04
Pb-210 1.889E+06 9.803E+05 5.232E+05 2.371E+05 1.570E+05 4.268E+05 7.284E+07 *7.634E+13
Ra-226 2.770E+02 2.769E+02 2.767E+02 2.758E+02 2.731E+02 2.630E+02 2.385E+02 1.778E+02
Th-230 1.163E+06 3.942E+05 1.696E+05 5.645E+04 1.922E+04 5.574E+03 1.639E+03 3.241E+02
U-234 7.085E+07 3.067E+07 1.443E+07 5.140E+06 1.897E+06 6.936E+05 3.556E+05 1.377E+05
U-235 1.898E+04 1.901E+04 1.906E+04 1.925E+04 1.979E+04 2.178E+04 2.898E+04 8.877E+04
U-238 3.086E+04 3.092E+04 3.102E+04 3.139E+04 3.250E+04 3.680E+04 5.383E+04 2.374E+05
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*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 = 1.000E+03 years

Nuclide Initial tmin DSR(i,tmin) G(i,tmin) DSR(i,tmax) G(i,tmax)
(i) (pCi/g) (years) (pCi/g) (pCi/g)
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Ac-227 1.000E+00 0.000E+00 6.202E-03 4.031E+03 2.050E-19 *7.232E+13
Pa-231 1.000E+00 132.4 ñ 0.3 6.405E-03 3.903E+03 1.667E-03 1.500E+04
Pb-210 1.000E+00 31.09 ñ 0.06 1.593E-04 1.569E+05 3.849E-16 *7.634E+13
Ra-226 1.000E+00 1.000E+03 1.406E-01 1.778E+02 1.406E-01 1.778E+02
Th-230 1.000E+00 1.000E+03 7.714E-02 3.241E+02 7.714E-02 3.241E+02
U-234 1.000E+00 1.000E+03 1.816E-04 1.377E+05 1.816E-04 1.377E+05
U-235 1.000E+00 0.000E+00 1.317E-03 1.898E+04 2.816E-04 8.877E+04
U-238 1.000E+00 0.000E+00 8.100E-04 3.086E+04 1.053E-04 2.374E+05
íííííííí íííííííííí íííííííííííííííí íííííííííí íííííííííí íííííííííí íííííííííí
*At specific activity limit

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Industrial Worker
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Individual Nuclide Dose Summed Over All Pathways
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	DOSE(j,t), mrem/yr t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-227	Ac-227	1.000E+00	6.202E-03	5.983E-03	5.567E-03	4.324E-03	2.094E-03	1.610E-04	9.072E-08	2.050E-19
Ac-227	Pa-231	1.000E+00	9.933E-05	2.934E-04	6.613E-04	1.761E-03	3.735E-03	5.366E-03	4.602E-03	1.307E-03
Ac-227	U-235	1.000E+00	7.027E-10	4.870E-09	2.518E-08	2.083E-07	1.425E-06	8.606E-06	2.667E-05	2.720E-05
Ac-227	äDOSE(j)		6.301E-03	6.276E-03	6.228E-03	6.085E-03	5.830E-03	5.536E-03	4.629E-03	1.335E-03
Pa-231	Pa-231	1.000E+00	5.754E-04	5.810E-04	5.921E-04	6.297E-04	7.269E-04	9.646E-04	1.099E-03	3.595E-04
Pa-231	U-235	1.000E+00	6.097E-09	1.845E-08	4.386E-08	1.399E-07	4.692E-07	2.053E-06	7.010E-06	7.691E-06
Pa-231	äDOSE(j)		5.754E-04	5.810E-04	5.922E-04	6.299E-04	7.274E-04	9.666E-04	1.106E-03	3.672E-04
Pb-210	Pb-210	1.000E+00	1.323E-05	2.550E-05	4.778E-05	1.055E-04	1.593E-04	5.858E-05	3.432E-07	3.849E-16
Pb-210	Ra-226	1.000E+00	2.411E-07	1.250E-06	5.520E-06	4.064E-05	2.501E-04	1.240E-03	3.547E-03	8.691E-03
Pb-210	Th-230	1.000E+00	3.739E-11	4.351E-10	4.316E-09	9.768E-08	1.915E-06	3.970E-05	4.346E-04	4.436E-03
Pb-210	U-234	1.000E+00	8.757E-17	2.150E-15	4.649E-14	3.142E-12	1.839E-10	1.326E-08	4.142E-07	9.096E-06
Pb-210	U-238	9.999E-01	5.095E-23	2.570E-21	1.187E-19	2.371E-17	4.094E-15	1.010E-12	9.373E-11	5.204E-09
Pb-210	äDOSE(j)		1.347E-05	2.675E-05	5.331E-05	1.462E-04	4.113E-04	1.338E-03	3.983E-03	1.314E-02
Ra-226	Ra-226	1.000E+00	9.024E-02	9.028E-02	9.035E-02	9.060E-02	9.130E-02	9.381E-02	1.013E-01	1.319E-01
Ra-226	Th-230	1.000E+00	1.955E-05	5.869E-05	1.371E-04	4.130E-04	1.214E-03	4.166E-03	1.400E-02	7.003E-02
Ra-226	U-234	1.000E+00	5.863E-11	4.103E-10	2.167E-09	1.933E-08	1.618E-07	1.713E-06	1.441E-05	1.455E-04
Ra-226	U-238	9.999E-01	4.153E-17	6.225E-16	7.251E-15	1.911E-13	4.594E-12	1.548E-10	3.530E-09	8.469E-08
Ra-226	äDOSE(j)		9.026E-02	9.034E-02	9.049E-02	9.101E-02	9.252E-02	9.797E-02	1.153E-01	2.021E-01
Th-230	Th-230	1.000E+00	1.951E-06	4.735E-06	1.030E-05	2.979E-05	8.538E-05	2.792E-04	8.265E-04	2.668E-03
Th-230	U-234	1.000E+00	1.086E-11	6.586E-11	3.249E-10	2.772E-09	2.236E-08	2.168E-07	1.450E-06	7.354E-06
Th-230	U-238	9.999E-01	1.124E-17	1.493E-16	1.630E-15	4.109E-14	9.516E-13	2.927E-11	5.227E-10	5.721E-09
Th-230	äDOSE(j)		1.951E-06	4.735E-06	1.030E-05	2.979E-05	8.541E-05	2.794E-04	8.279E-04	2.675E-03
U-234	U-234	1.000E+00	3.528E-07	8.146E-07	1.730E-06	4.842E-06	1.299E-05	3.410E-05	5.404E-05	1.961E-05
U-234	U-238	9.999E-01	6.095E-13	3.573E-12	1.727E-11	1.442E-10	1.124E-09	9.716E-09	4.605E-08	5.570E-08
U-234	äDOSE(j)		3.528E-07	8.147E-07	1.730E-06	4.842E-06	1.299E-05	3.411E-05	5.408E-05	1.967E-05
U-235	U-235	1.000E+00	1.317E-03	1.315E-03	1.311E-03	1.298E-03	1.261E-03	1.137E-03	8.291E-04	2.467E-04
U-238	U-238	5.400E-05	1.128E-11	3.374E-11	7.825E-11	2.296E-10	6.261E-10	1.653E-09	2.625E-09	9.543E-10
U-238	U-238	9.999E-01	8.100E-04	8.086E-04	8.059E-04	7.963E-04	7.693E-04	6.793E-04	4.644E-04	1.051E-04
U-238	äDOSE(j)		8.100E-04	8.086E-04	8.059E-04	7.963E-04	7.693E-04	6.793E-04	4.644E-04	1.051E-04

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

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Industrial Worker
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Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-227	Ac-227	1.000E+00	1.000E+00	9.611E-01	8.877E-01	6.724E-01	3.040E-01	1.888E-02	6.732E-06	5.762E-18
Ac-227	Pa-231	1.000E+00	0.000E+00	3.116E-02	8.960E-02	2.583E-01	5.275E-01	6.176E-01	3.354E-01	3.608E-02
Ac-227	U-235	1.000E+00	0.000E+00	3.317E-07	2.896E-06	2.899E-05	1.974E-04	9.846E-04	1.940E-03	7.501E-04
Ac-227	äS(j):		1.000E+00	9.922E-01	9.773E-01	9.307E-01	8.316E-01	6.375E-01	3.373E-01	3.683E-02
Pa-231	Pa-231	1.000E+00	1.000E+00	9.968E-01	9.905E-01	9.687E-01	9.089E-01	7.272E-01	3.846E-01	4.137E-02
Pa-231	U-235	1.000E+00	0.000E+00	2.109E-05	6.287E-05	2.050E-04	5.771E-04	1.540E-03	2.449E-03	8.847E-04
Pa-231	äS(j):		1.000E+00	9.968E-01	9.906E-01	9.689E-01	9.094E-01	7.288E-01	3.871E-01	4.226E-02
Pb-210	Pb-210	1.000E+00	1.000E+00	9.693E-01	9.108E-01	7.323E-01	3.927E-01	4.434E-02	8.718E-05	2.938E-14
Pb-210	Ra-226	1.000E+00	0.000E+00	3.060E-02	8.896E-02	2.665E-01	6.013E-01	9.236E-01	8.873E-01	6.533E-01
Pb-210	Th-230	1.000E+00	0.000E+00	6.662E-06	5.872E-05	6.075E-04	4.518E-03	2.939E-02	1.085E-01	3.332E-01
Pb-210	U-234	1.000E+00	0.000E+00	2.003E-11	5.315E-10	1.855E-08	4.263E-07	9.767E-06	1.033E-04	6.832E-04
Pb-210	U-238	9.999E-01	0.000E+00	1.421E-17	1.134E-15	1.329E-13	9.328E-12	7.402E-10	2.333E-08	3.907E-07
Pb-210	äS(j):		1.000E+00	9.999E-01	9.998E-01	9.993E-01	9.985E-01	9.974E-01	9.960E-01	9.872E-01
Ra-226	Ra-226	1.000E+00	1.000E+00	9.996E-01	9.987E-01	9.956E-01	9.870E-01	9.572E-01	8.770E-01	6.457E-01
Ra-226	Th-230	1.000E+00	0.000E+00	4.331E-04	1.299E-03	4.322E-03	1.290E-02	4.229E-02	1.210E-01	3.427E-01
Ra-226	U-234	1.000E+00	0.000E+00	1.948E-09	1.749E-08	1.926E-07	1.692E-06	1.731E-05	1.244E-04	7.118E-04
Ra-226	U-238	9.999E-01	0.000E+00	1.839E-15	4.949E-14	1.811E-12	4.728E-11	1.557E-09	3.043E-08	4.142E-07
Ra-226	äS(j):		1.000E+00	1.000E+00	1.000E+00	1.000E+00	9.999E-01	9.995E-01	9.981E-01	9.891E-01
Th-230	Th-230	1.000E+00	1.000E+00	1.000E+00	9.999E-01	9.996E-01	9.987E-01	9.956E-01	9.868E-01	9.567E-01
Th-230	U-234	1.000E+00	0.000E+00	8.987E-06	2.688E-05	8.859E-05	2.575E-04	7.698E-04	1.730E-03	2.637E-03
Th-230	U-238	9.999E-01	0.000E+00	1.273E-11	1.141E-10	1.249E-09	1.078E-08	1.035E-07	6.226E-07	2.051E-06
Th-230	äS(j):		1.000E+00	1.000E+00	9.999E-01	9.996E-01	9.989E-01	9.963E-01	9.885E-01	9.593E-01
U-234	U-234	1.000E+00	1.000E+00	9.968E-01	9.905E-01	9.688E-01	9.094E-01	7.286E-01	3.867E-01	4.214E-02
U-234	U-238	9.999E-01	0.000E+00	2.826E-06	8.424E-06	2.746E-05	7.734E-05	2.066E-04	3.290E-04	1.196E-04
U-234	äS(j):		1.000E+00	9.968E-01	9.906E-01	9.689E-01	9.094E-01	7.288E-01	3.871E-01	4.226E-02
U-235	U-235	1.000E+00	1.000E+00	9.968E-01	9.906E-01	9.689E-01	9.094E-01	7.288E-01	3.871E-01	4.226E-02
U-238	U-238	5.400E-05	5.400E-05	5.383E-05	5.349E-05	5.232E-05	4.911E-05	3.935E-05	2.090E-05	2.282E-06
U-238	U-238	9.999E-01	9.999E-01	9.968E-01	9.905E-01	9.688E-01	9.094E-01	7.287E-01	3.870E-01	4.226E-02
U-238	äS(j):		1.000E+00	9.968E-01	9.906E-01	9.689E-01	9.094E-01	7.288E-01	3.871E-01	4.226E-02

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

RESCALC.EXE execution time = 1.30 seconds

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Industrial Worker
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Part III: Intake Quantities and Health Risk Factors

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Industrial Worker
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Cancer Risk Slope Factors Summary Table
Risk Library: FGR 13 Morbidity

Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-1	Ground external radiation slope factors, 1/yr per (pCi/g):			
Sf-1	Ac-227+D	1.47E-06	3.48E-10	SLPF(1,1)
Sf-1	Pa-231	1.39E-07	1.39E-07	SLPF(2,1)
Sf-1	Pb-210+D	4.21E-09	1.41E-09	SLPF(3,1)
Sf-1	Ra-226+D	8.49E-06	2.29E-08	SLPF(4,1)
Sf-1	Th-230	8.19E-10	8.19E-10	SLPF(5,1)
Sf-1	U-234	2.52E-10	2.52E-10	SLPF(6,1)
Sf-1	U-235+D	5.43E-07	5.18E-07	SLPF(7,1)
Sf-1	U-238	4.99E-11	4.99E-11	SLPF(8,1)
Sf-1	U-238+D	1.14E-07	4.99E-11	SLPF(9,1)
Sf-2	Inhalation, slope factors, 1/(pCi):			
Sf-2	Ac-227+D	2.13E-07	1.49E-07	SLPF(1,2)
Sf-2	Pa-231	7.62E-08	7.62E-08	SLPF(2,2)
Sf-2	Pb-210+D	3.08E-08	1.58E-08	SLPF(3,2)
Sf-2	Ra-226+D	2.83E-08	2.82E-08	SLPF(4,2)
Sf-2	Th-230	3.40E-08	3.40E-08	SLPF(5,2)
Sf-2	U-234	2.78E-08	2.78E-08	SLPF(6,2)
Sf-2	U-235+D	2.50E-08	2.50E-08	SLPF(7,2)
Sf-2	U-238	2.36E-08	2.36E-08	SLPF(8,2)
Sf-2	U-238+D	2.36E-08	2.36E-08	SLPF(9,2)
Sf-3	Food ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.53E-10	2.45E-10	SLPF(1,3)
Sf-3	Pa-231	2.26E-10	2.26E-10	SLPF(2,3)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF(3,3)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF(4,3)
Sf-3	Th-230	1.19E-10	1.19E-10	SLPF(5,3)
Sf-3	U-234	9.55E-11	9.55E-11	SLPF(6,3)
Sf-3	U-235+D	9.76E-11	9.44E-11	SLPF(7,3)
Sf-3	U-238	8.66E-11	8.66E-11	SLPF(8,3)
Sf-3	U-238+D	1.21E-10	8.66E-11	SLPF(9,3)
Sf-3	Water ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	4.86E-10	2.01E-10	SLPF(1,4)
Sf-3	Pa-231	1.73E-10	1.73E-10	SLPF(2,4)
Sf-3	Pb-210+D	2.66E-09	8.81E-10	SLPF(3,4)
Sf-3	Ra-226+D	3.86E-10	3.85E-10	SLPF(4,4)
Sf-3	Th-230	9.10E-11	9.10E-11	SLPF(5,4)
Sf-3	U-234	7.07E-11	7.07E-11	SLPF(6,4)
Sf-3	U-235+D	7.18E-11	6.96E-11	SLPF(7,4)
Sf-3	U-238	6.40E-11	6.40E-11	SLPF(8,4)
Sf-3	U-238+D	8.71E-11	6.40E-11	SLPF(9,4)
Sf-3	Soil ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.53E-10	2.45E-10	SLPF(1,5)
Sf-3	Pa-231	2.26E-10	2.26E-10	SLPF(2,5)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF(3,5)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF(4,5)
Sf-3	Th-230	1.19E-10	1.19E-10	SLPF(5,5)

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Industrial Worker
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Cancer Risk Slope Factors Summary Table (continued)
Risk Library: FGR 13 Morbidity

Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-3	U-234	9.55E-11	9.55E-11	SLPF(6,5)
Sf-3	U-235+D	9.76E-11	9.44E-11	SLPF(7,5)
Sf-3	U-238	8.66E-11	8.66E-11	SLPF(8,5)
Sf-3	U-238+D	1.21E-10	8.66E-11	SLPF(9,5)
Sf-Rn	Radon Inhalation slope factors, 1/(pCi):			
Sf-Rn	Rn-222	1.80E-12	1.80E-12	SLPFRN(1,1)
Sf-Rn	Po-218	3.70E-12	3.70E-12	SLPFRN(1,2)
Sf-Rn	Pb-214	6.20E-12	6.20E-12	SLPFRN(1,3)
Sf-Rn	Bi-214	1.50E-11	1.50E-11	SLPFRN(1,4)
Sf-Rn	Radon K factors, (mrem/WLM):			
Sf-Rn	Rn-222 Indoor	3.88E+02	3.88E+02	KFACTR(1,1)
Sf-Rn	Rn-222 Outdoor	3.88E+02	3.88E+02	KFACTR(1,2)

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

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Industrial Worker

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Risk Slope and Environmental Transport Factors for the Ground Pathway

Nuclide	Slope(i)*	ETFG(i,t) At Time in Years (dimensionless)							
(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
Ac-227	3.480E-10	1.060E-03	1.062E-03	1.066E-03	1.078E-03	1.114E-03	1.250E-03	1.737E-03	5.495E-03
At-218	3.570E-09	3.553E-06	3.567E-06	3.595E-06	3.694E-06	3.992E-06	5.239E-06	1.139E-05	1.724E-04
Bi-210	2.760E-09	1.185E-03	1.187E-03	1.190E-03	1.202E-03	1.236E-03	1.361E-03	1.795E-03	4.726E-03
Bi-211	1.880E-07	3.836E-03	3.840E-03	3.849E-03	3.880E-03	3.969E-03	4.297E-03	5.392E-03	1.194E-02
Bi-214	7.480E-06	9.157E-03	9.164E-03	9.178E-03	9.229E-03	9.375E-03	9.904E-03	1.159E-02	2.006E-02
Fr-223	1.400E-07	1.969E-03	1.972E-03	1.977E-03	1.996E-03	2.052E-03	2.260E-03	2.976E-03	7.803E-03
Pa-231	1.390E-07	3.250E-03	3.254E-03	3.261E-03	3.289E-03	3.369E-03	3.666E-03	4.664E-03	1.084E-02
Pa-234	8.710E-06	6.858E-03	6.864E-03	6.877E-03	6.920E-03	7.046E-03	7.503E-03	8.981E-03	1.685E-02
Pa-234m	6.870E-08	5.669E-03	5.674E-03	5.685E-03	5.721E-03	5.826E-03	6.210E-03	7.452E-03	1.411E-02
Pb-210	1.410E-09	2.932E-08	2.949E-08	2.984E-08	3.108E-08	3.493E-08	5.254E-08	1.687E-07	1.001E-05
Pb-211	2.290E-07	5.708E-03	5.713E-03	5.724E-03	5.764E-03	5.877E-03	6.293E-03	7.648E-03	1.514E-02
Pb-214	9.820E-07	3.811E-03	3.815E-03	3.824E-03	3.854E-03	3.943E-03	4.269E-03	5.357E-03	1.186E-02
Po-210	3.950E-11	6.954E-03	6.960E-03	6.973E-03	7.016E-03	7.143E-03	7.603E-03	9.089E-03	1.698E-02
Po-211	3.580E-08	6.553E-03	6.559E-03	6.571E-03	6.614E-03	6.736E-03	7.183E-03	8.631E-03	1.641E-02
Po-214	3.860E-10	6.751E-03	6.757E-03	6.769E-03	6.812E-03	6.936E-03	7.390E-03	8.857E-03	1.669E-02
Po-215	7.480E-10	4.708E-03	4.712E-03	4.722E-03	4.757E-03	4.858E-03	5.230E-03	6.454E-03	1.347E-02
Po-218	4.260E-11	6.984E-03	6.991E-03	7.003E-03	7.047E-03	7.174E-03	7.637E-03	9.129E-03	1.705E-02
Ra-223	4.340E-07	2.183E-03	2.186E-03	2.192E-03	2.213E-03	2.274E-03	2.501E-03	3.281E-03	8.487E-03
Ra-226	2.290E-08	2.073E-03	2.076E-03	2.082E-03	2.102E-03	2.161E-03	2.381E-03	3.139E-03	8.266E-03
Rn-219	2.250E-07	3.913E-03	3.918E-03	3.927E-03	3.958E-03	4.048E-03	4.381E-03	5.490E-03	1.209E-02
Rn-222	1.740E-09	4.966E-03	4.971E-03	4.982E-03	5.018E-03	5.123E-03	5.507E-03	6.771E-03	1.396E-02
Th-227	3.780E-07	2.758E-03	2.762E-03	2.769E-03	2.794E-03	2.866E-03	3.132E-03	4.036E-03	9.812E-03
Th-230	8.190E-10	5.211E-04	5.221E-04	5.241E-04	5.312E-04	5.518E-04	6.306E-04	9.232E-04	3.506E-03
Th-231	2.450E-08	4.223E-04	4.231E-04	4.248E-04	4.308E-04	4.483E-04	5.155E-04	7.683E-04	3.105E-03
Th-234	1.630E-08	3.035E-04	3.041E-04	3.054E-04	3.100E-04	3.236E-04	3.757E-04	5.760E-04	2.569E-03
Tl-207	1.520E-08	4.207E-03	4.211E-03	4.219E-03	4.249E-03	4.336E-03	4.652E-03	5.691E-03	1.152E-02
Tl-210	0.000E+00	8.702E-03	8.709E-03	8.723E-03	8.772E-03	8.914E-03	9.430E-03	1.107E-02	1.943E-02
U-234	2.520E-10	3.514E-04	3.521E-04	3.535E-04	3.585E-04	3.732E-04	4.295E-04	6.418E-04	2.618E-03
U-235	5.180E-07	1.977E-03	1.980E-03	1.986E-03	2.005E-03	2.062E-03	2.275E-03	3.012E-03	8.038E-03
U-238	4.990E-11	9.479E-08	9.527E-08	9.625E-08	9.975E-08	1.105E-07	1.579E-07	4.378E-07	1.555E-05

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

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

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pa-231	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pb-210	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.156E-07	0.0579	2.132E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.430E-10	0.0002
Pa-231	1.102E-08	0.0055	8.090E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.258E-10	0.0001
Pb-210	9.009E-11	0.0000	3.438E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.018E-09	0.0010
Ra-226	1.826E-06	0.9149	3.163E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.020E-10	0.0002
Th-230	1.092E-11	0.0000	3.802E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.979E-11	0.0000
U-234	2.182E-12	0.0000	2.951E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.317E-11	0.0000
U-235	2.530E-08	0.0127	2.654E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.436E-11	0.0000
U-238	1.436E-08	0.0072	2.509E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.715E-11	0.0000
Total	1.992E-06	0.9982	4.793E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.034E-09	0.0015

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Industrial Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.161E-07	0.0582
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.123E-08	0.0056
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.143E-09	0.0011
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.826E-06	0.9150
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.187E-10	0.0001
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.487E-11	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.539E-08	0.0127
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.445E-08	0.0072
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.995E-06	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Industrial Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	7.955E-08	0.0399	1.265E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.034E-10	0.0001
Pa-231	4.702E-08	0.0236	1.676E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.653E-10	0.0001
Pb-210	6.250E-11	0.0000	2.083E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.223E-09	0.0006
Ra-226	1.816E-06	0.9099	4.489E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.092E-09	0.0005
Th-230	9.890E-09	0.0050	3.830E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.543E-11	0.0000
U-234	2.912E-12	0.0000	2.952E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.318E-11	0.0000
U-235	2.531E-08	0.0127	2.659E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.444E-11	0.0000
U-238	1.436E-08	0.0072	2.509E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.715E-11	0.0000
Total	1.992E-06	0.9982	4.793E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.034E-09	0.0015

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

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.988E-08	0.0400
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.745E-08	0.0238
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.306E-09	0.0007
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.817E-06	0.9105
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.000E-08	0.0050
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.561E-11	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.540E-08	0.0127
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.445E-08	0.0072
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.995E-06	1.0000

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

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

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	3.553E-06	0.000E+00	0.000E+00	0.000E+00	1.863E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.863E-03
Pa-231	3.570E-06	0.000E+00	0.000E+00	0.000E+00	1.872E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.872E-03
Pb-210	3.581E-06	0.000E+00	0.000E+00	0.000E+00	1.878E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.878E-03
Ra-226	3.581E-06	0.000E+00	0.000E+00	0.000E+00	1.878E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.878E-03
Th-230	3.581E-06	0.000E+00	0.000E+00	0.000E+00	1.878E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.878E-03
U-234	3.570E-06	0.000E+00	0.000E+00	0.000E+00	1.872E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.872E-03
U-235	3.570E-06	0.000E+00	0.000E+00	0.000E+00	1.872E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.872E-03
U-238	3.570E-06	0.000E+00	0.000E+00	0.000E+00	1.872E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.872E-03

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.150E-07	0.0576	2.293E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.690E-10	0.0002
Pa-231	1.100E-08	0.0055	8.718E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.356E-10	0.0001
Pb-210	9.021E-11	0.0000	3.713E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.180E-09	0.0011
Ra-226	1.827E-06	0.9151	3.416E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.262E-10	0.0002
Th-230	1.094E-11	0.0000	4.106E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.537E-11	0.0000
U-234	2.179E-12	0.0000	3.181E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.730E-11	0.0000
U-235	2.526E-08	0.0127	2.860E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.858E-11	0.0000
U-238	1.433E-08	0.0072	2.704E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.237E-11	0.0000
Total	1.993E-06	0.9981	5.163E-10	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.274E-09	0.0016

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Industrial Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.156E-07	0.0579
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.122E-08	0.0056
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.307E-09	0.0012
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.827E-06	0.9153
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.274E-10	0.0001
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.129E-11	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.535E-08	0.0127
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.442E-08	0.0072
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.996E-06	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Industrial Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	7.654E-08	0.0383	1.331E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.142E-10	0.0001
Pa-231	4.941E-08	0.0247	1.833E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.903E-10	0.0001
Pb-210	6.066E-11	0.0000	2.205E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.294E-09	0.0006
Ra-226	1.816E-06	0.9098	4.892E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.205E-09	0.0006
Th-230	1.068E-08	0.0054	4.138E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.184E-11	0.0000
U-234	3.000E-12	0.0000	3.181E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.731E-11	0.0000
U-235	2.527E-08	0.0127	2.866E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.867E-11	0.0000
U-238	1.433E-08	0.0072	2.704E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.237E-11	0.0000
Total	1.993E-06	0.9981	5.163E-10	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.274E-09	0.0016

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.689E-08	0.0385
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.988E-08	0.0250
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.377E-09	0.0007
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.818E-06	0.9104
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.081E-08	0.0054
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.212E-11	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.536E-08	0.0127
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.442E-08	0.0072
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.996E-06	1.0000

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

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

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.050E-05	0.000E+00	0.000E+00	0.000E+00	5.506E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.506E-03
Pa-231	1.064E-05	0.000E+00	0.000E+00	0.000E+00	5.580E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.580E-03
Pb-210	1.074E-05	0.000E+00	0.000E+00	0.000E+00	5.632E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.632E-03
Ra-226	1.074E-05	0.000E+00	0.000E+00	0.000E+00	5.634E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.634E-03
Th-230	1.074E-05	0.000E+00	0.000E+00	0.000E+00	5.633E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.633E-03
U-234	1.064E-05	0.000E+00	0.000E+00	0.000E+00	5.580E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.580E-03
U-235	1.064E-05	0.000E+00	0.000E+00	0.000E+00	5.580E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.580E-03
U-238	1.064E-05	0.000E+00	0.000E+00	0.000E+00	5.580E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.580E-03

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.138E-07	0.0569	2.611E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.200E-10	0.0002
Pa-231	1.096E-08	0.0055	9.962E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.550E-10	0.0001
Pb-210	9.044E-11	0.0000	4.263E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.503E-09	0.0013
Ra-226	1.830E-06	0.9156	3.922E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.745E-10	0.0002
Th-230	1.098E-11	0.0000	4.714E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.653E-11	0.0000
U-234	2.174E-12	0.0000	3.635E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.548E-11	0.0000
U-235	2.517E-08	0.0126	3.269E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.695E-11	0.0000
U-238	1.426E-08	0.0071	3.089E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.269E-11	0.0000
Total	1.994E-06	0.9978	5.896E-10	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.754E-09	0.0019

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Industrial Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.145E-07	0.0573
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.121E-08	0.0056
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.636E-09	0.0013
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.830E-06	0.9158
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.447E-10	0.0001
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.040E-10	0.0001
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.527E-08	0.0126
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.437E-08	0.0072
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.999E-06	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Industrial Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	7.086E-08	0.0355	1.444E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.324E-10	0.0001
Pa-231	5.389E-08	0.0270	2.162E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.425E-10	0.0002
Pb-210	5.715E-11	0.0000	2.420E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.421E-09	0.0007
Ra-226	1.818E-06	0.9095	5.724E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.448E-09	0.0007
Th-230	1.228E-08	0.0061	4.755E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.492E-11	0.0000
U-234	3.197E-12	0.0000	3.635E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.549E-11	0.0000
U-235	2.518E-08	0.0126	3.275E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.705E-11	0.0000
U-238	1.426E-08	0.0071	3.090E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.270E-11	0.0000
Total	1.994E-06	0.9978	5.896E-10	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.754E-09	0.0019

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.124E-08	0.0356
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.445E-08	0.0272
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.502E-09	0.0008
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.819E-06	0.9102
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.242E-08	0.0062
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.050E-10	0.0001
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.528E-08	0.0127
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.437E-08	0.0072
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.999E-06	1.0000

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

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

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	3.333E-05	0.000E+00	0.000E+00	0.000E+00	1.748E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.748E-02
Pa-231	3.469E-05	0.000E+00	0.000E+00	0.000E+00	1.819E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.819E-02
Pb-210	3.578E-05	0.000E+00	0.000E+00	0.000E+00	1.877E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.877E-02
Ra-226	3.580E-05	0.000E+00	0.000E+00	0.000E+00	1.878E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.878E-02
Th-230	3.579E-05	0.000E+00	0.000E+00	0.000E+00	1.877E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.877E-02
U-234	3.469E-05	0.000E+00	0.000E+00	0.000E+00	1.819E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.819E-02
U-235	3.469E-05	0.000E+00	0.000E+00	0.000E+00	1.819E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.819E-02
U-238	3.469E-05	0.000E+00	0.000E+00	0.000E+00	1.819E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.819E-02

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.102E-07	0.0549	3.668E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.902E-10	0.0003
Pa-231	1.081E-08	0.0054	1.419E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.207E-10	0.0001
Pb-210	9.127E-11	0.0000	6.186E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.632E-09	0.0018
Ra-226	1.840E-06	0.9171	5.693E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.437E-10	0.0003
Th-230	1.113E-11	0.0000	6.842E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.256E-10	0.0001
U-234	2.157E-12	0.0000	5.178E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.328E-11	0.0000
U-235	2.486E-08	0.0124	4.656E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.537E-11	0.0000
U-238	1.404E-08	0.0070	4.401E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.178E-10	0.0001
Total	2.000E-06	0.9969	8.383E-10	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.419E-09	0.0027

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Industrial Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.112E-07	0.0554
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.117E-08	0.0056
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.785E-09	0.0019
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.841E-06	0.9174
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.051E-10	0.0001
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.472E-10	0.0001
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.501E-08	0.0125
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.420E-08	0.0071
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.006E-06	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Industrial Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	5.411E-08	0.0270	1.663E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.675E-10	0.0001
Pa-231	6.687E-08	0.0333	3.424E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.432E-10	0.0003
Pb-210	4.639E-11	0.0000	2.926E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.718E-09	0.0009
Ra-226	1.822E-06	0.9082	8.872E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.440E-09	0.0012
Th-230	1.788E-08	0.0089	6.922E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.437E-10	0.0001
U-234	4.105E-12	0.0000	5.179E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.330E-11	0.0000
U-235	2.489E-08	0.0124	4.670E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.559E-11	0.0000
U-238	1.404E-08	0.0070	4.401E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.178E-10	0.0001
Total	2.000E-06	0.9969	8.383E-10	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.419E-09	0.0027

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.454E-08	0.0272
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.776E-08	0.0338
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.794E-09	0.0009
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.825E-06	0.9095
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.809E-08	0.0090
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.492E-10	0.0001
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.503E-08	0.0125
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.420E-08	0.0071
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.006E-06	1.0000

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

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 3.000E+01 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	8.933E-05	0.000E+00	0.000E+00	0.000E+00	4.685E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.685E-02
Pa-231	9.769E-05	0.000E+00	0.000E+00	0.000E+00	5.123E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.123E-02
Pb-210	1.073E-04	0.000E+00	0.000E+00	0.000E+00	5.625E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.625E-02
Ra-226	1.074E-04	0.000E+00	0.000E+00	0.000E+00	5.633E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.633E-02
Th-230	1.073E-04	0.000E+00	0.000E+00	0.000E+00	5.627E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.627E-02
U-234	9.769E-05	0.000E+00	0.000E+00	0.000E+00	5.123E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.123E-02
U-235	9.769E-05	0.000E+00	0.000E+00	0.000E+00	5.123E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.123E-02
U-238	9.769E-05	0.000E+00	0.000E+00	0.000E+00	5.123E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.123E-02

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

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 3.000E+01 years

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

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

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.024E-07	0.0504	6.338E-10	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.020E-09	0.0005
Pa-231	1.039E-08	0.0051	2.525E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.927E-10	0.0002
Pb-210	9.370E-11	0.0000	1.168E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.856E-09	0.0034
Ra-226	1.870E-06	0.9203	1.075E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.027E-09	0.0005
Th-230	1.155E-11	0.0000	1.291E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.371E-10	0.0001
U-234	2.108E-12	0.0000	9.212E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.660E-10	0.0001
U-235	2.401E-08	0.0118	8.285E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.697E-10	0.0001
U-238	1.342E-08	0.0066	7.831E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.096E-10	0.0001
Total	2.020E-06	0.9943	1.493E-09	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.008E-08	0.0050

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Industrial Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.041E-07	0.0512
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.104E-08	0.0054
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.067E-09	0.0035
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.871E-06	0.9209
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.778E-10	0.0002
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.602E-10	0.0001
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.426E-08	0.0119
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.371E-08	0.0067
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.032E-06	1.0000

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

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+01 years

Radionuclides

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

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

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Industrial Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.504E-08	0.0123	1.486E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.391E-10	0.0001
Pa-231	8.771E-08	0.0432	7.371E-10	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.172E-09	0.0006
Pb-210	2.555E-11	0.0000	3.071E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.803E-09	0.0009
Ra-226	1.836E-06	0.9036	1.906E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.002E-09	0.0030
Th-230	3.412E-08	0.0168	1.321E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.153E-10	0.0002
U-234	8.543E-12	0.0000	9.216E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.660E-10	0.0001
U-235	2.406E-08	0.0118	8.337E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.705E-10	0.0001
U-238	1.342E-08	0.0066	7.832E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.096E-10	0.0001
Total	2.020E-06	0.9943	1.493E-09	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.008E-08	0.0050

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.542E-08	0.0125
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.962E-08	0.0441
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.859E-09	0.0009
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.842E-06	0.9066
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.456E-08	0.0170
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.667E-10	0.0001
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.431E-08	0.0120
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.371E-08	0.0067
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.032E-06	1.0000

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

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

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	2.283E-04	0.000E+00	0.000E+00	0.000E+00	1.197E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.197E-01
Pa-231	2.609E-04	0.000E+00	0.000E+00	0.000E+00	1.368E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.368E-01
Pb-210	3.571E-04	0.000E+00	0.000E+00	0.000E+00	1.873E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.873E-01
Ra-226	3.579E-04	0.000E+00	0.000E+00	0.000E+00	1.877E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.877E-01
Th-230	3.568E-04	0.000E+00	0.000E+00	0.000E+00	1.871E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.871E-01
U-234	2.609E-04	0.000E+00	0.000E+00	0.000E+00	1.368E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.368E-01
U-235	2.609E-04	0.000E+00	0.000E+00	0.000E+00	1.368E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.368E-01
U-238	2.609E-04	0.000E+00	0.000E+00	0.000E+00	1.368E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.368E-01

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	8.644E-08	0.0405	1.310E-09	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.108E-09	0.0010
Pa-231	9.060E-09	0.0042	5.369E-10	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.351E-10	0.0004
Pb-210	1.029E-10	0.0000	3.089E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.813E-08	0.0085
Ra-226	1.977E-06	0.9263	2.845E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.717E-09	0.0013
Th-230	1.317E-11	0.0000	3.410E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.259E-10	0.0003
U-234	1.944E-12	0.0000	1.959E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.529E-10	0.0002
U-235	2.123E-08	0.0099	1.762E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.608E-10	0.0002
U-238	1.147E-08	0.0054	1.665E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.457E-10	0.0002
Total	2.105E-06	0.9865	3.320E-09	0.0016	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.558E-08	0.0120

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Industrial Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.985E-08	0.0421
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.043E-08	0.0049
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.855E-08	0.0087
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.980E-06	0.9277
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.800E-10	0.0005
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.507E-10	0.0003
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.177E-08	0.0102
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.208E-08	0.0057
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.134E-06	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Industrial Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.687E-09	0.0008	2.520E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.055E-11	0.0000
Pa-231	9.363E-08	0.0439	1.818E-09	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.897E-09	0.0014
Pb-210	3.171E-12	0.0000	9.404E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.521E-10	0.0003
Ra-226	1.883E-06	0.8824	5.597E-10	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.954E-08	0.0092
Th-230	9.389E-08	0.0440	3.650E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.384E-09	0.0006
U-234	4.482E-11	0.0000	1.961E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.536E-10	0.0002
U-235	2.141E-08	0.0100	1.798E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.666E-10	0.0002
U-238	1.147E-08	0.0054	1.666E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.458E-10	0.0002
Total	2.105E-06	0.9865	3.320E-09	0.0016	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.558E-08	0.0120

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.753E-09	0.0008
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.835E-08	0.0461
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.647E-10	0.0003
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.903E-06	0.8918
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.563E-08	0.0448
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.946E-10	0.0003
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.195E-08	0.0103
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.208E-08	0.0057
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.134E-06	1.0000

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

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

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	3.623E-04	0.000E+00	0.000E+00	0.000E+00	1.900E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.900E-01
Pa-231	4.158E-04	0.000E+00	0.000E+00	0.000E+00	2.180E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.180E-01
Pb-210	1.070E-03	0.000E+00	0.000E+00	0.000E+00	5.611E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.611E-01
Ra-226	1.072E-03	0.000E+00	0.000E+00	0.000E+00	5.623E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.623E-01
Th-230	1.062E-03	0.000E+00	0.000E+00	0.000E+00	5.569E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.569E-01
U-234	4.158E-04	0.000E+00	0.000E+00	0.000E+00	2.180E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.180E-01
U-235	4.158E-04	0.000E+00	0.000E+00	0.000E+00	2.180E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.180E-01
U-238	4.158E-04	0.000E+00	0.000E+00	0.000E+00	2.180E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.180E-01

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	5.780E-08	0.0233	1.930E-09	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.105E-09	0.0013
Pa-231	6.122E-09	0.0025	7.928E-10	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.233E-09	0.0005
Pb-210	1.345E-10	0.0001	8.568E-10	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.030E-08	0.0203
Ra-226	2.319E-06	0.9362	7.893E-10	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.537E-09	0.0030
Th-230	1.913E-11	0.0000	9.397E-10	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.725E-09	0.0007
U-234	1.543E-12	0.0000	2.893E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.211E-10	0.0002
U-235	1.495E-08	0.0060	2.601E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.328E-10	0.0002
U-238	7.323E-09	0.0030	2.459E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.581E-10	0.0003
Total	2.405E-06	0.9710	6.104E-09	0.0025	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.561E-08	0.0265

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Industrial Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.284E-08	0.0254
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.149E-09	0.0033
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.129E-08	0.0207
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.327E-06	0.9395
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.684E-09	0.0011
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.119E-10	0.0003
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.574E-08	0.0064
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.227E-09	0.0033
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.477E-06	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Industrial Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	7.593E-13	0.0000	2.526E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.063E-14	0.0000
Pa-231	6.354E-08	0.0257	2.706E-09	0.0011	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.311E-09	0.0017
Pb-210	8.164E-15	0.0000	5.183E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.043E-12	0.0000
Ra-226	2.027E-06	0.8182	1.449E-09	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.116E-08	0.0207
Th-230	2.920E-07	0.1179	1.135E-09	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.393E-09	0.0034
U-234	3.112E-10	0.0001	2.909E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.304E-10	0.0002
U-235	1.533E-08	0.0062	2.770E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.596E-10	0.0002
U-238	7.324E-09	0.0030	2.461E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.586E-10	0.0003
Total	2.405E-06	0.9710	6.104E-09	0.0025	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.561E-08	0.0265

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.252E-13	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.055E-08	0.0285
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.103E-12	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.079E-06	0.8395
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.015E-07	0.1217
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.132E-09	0.0005
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.617E-08	0.0065
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.228E-09	0.0033
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.477E-06	1.0000

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

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

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.319E-04	0.000E+00	0.000E+00	0.000E+00	6.915E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.915E-02
Pa-231	1.513E-04	0.000E+00	0.000E+00	0.000E+00	7.935E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.935E-02
Pb-210	3.535E-03	0.000E+00	0.000E+00	0.000E+00	1.854E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.854E+00
Ra-226	3.542E-03	0.000E+00	0.000E+00	0.000E+00	1.857E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.857E+00
Th-230	3.435E-03	0.000E+00	0.000E+00	0.000E+00	1.801E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.801E+00
U-234	1.513E-04	0.000E+00	0.000E+00	0.000E+00	7.935E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.935E-02
U-235	1.513E-04	0.000E+00	0.000E+00	0.000E+00	7.935E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.935E-02
U-238	1.513E-04	0.000E+00	0.000E+00	0.000E+00	7.935E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.935E-02

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.435E-08	0.0034	6.830E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.099E-09	0.0003
Pa-231	1.553E-09	0.0004	2.806E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.364E-10	0.0001
Pb-210	3.446E-10	0.0001	2.751E-09	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.615E-07	0.0378
Ra-226	4.044E-06	0.9473	2.534E-09	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.420E-08	0.0057
Th-230	7.050E-11	0.0000	2.955E-09	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.423E-09	0.0013
U-234	6.870E-13	0.0000	1.024E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.844E-10	0.0000
U-235	4.383E-09	0.0010	9.206E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.885E-10	0.0000
U-238	1.534E-09	0.0004	8.701E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.329E-10	0.0001
Total	4.066E-06	0.9525	9.485E-09	0.0022	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.933E-07	0.0453

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Industrial Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.613E-08	0.0038
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.270E-09	0.0005
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.646E-07	0.0386
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.070E-06	0.9535
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.448E-09	0.0020
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.875E-10	0.0001
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.663E-09	0.0011
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.854E-09	0.0004
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.269E-06	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Industrial Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.478E-24	0.0000	7.035E-26	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.132E-25	0.0000
Pa-231	1.557E-08	0.0036	9.435E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.503E-09	0.0004
Pb-210	7.110E-24	0.0000	5.680E-23	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.335E-21	0.0000
Ra-226	2.626E-06	0.6152	3.457E-09	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.220E-07	0.0286
Th-230	1.415E-06	0.3315	4.771E-09	0.0011	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.896E-08	0.0162
U-234	2.954E-09	0.0007	1.140E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.300E-10	0.0001
U-235	4.712E-09	0.0011	1.121E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.204E-10	0.0001
U-238	1.536E-09	0.0004	8.731E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.335E-10	0.0001
Total	4.066E-06	0.9525	9.485E-09	0.0022	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.933E-07	0.0453

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.661E-24	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.802E-08	0.0042
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.399E-21	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.752E-06	0.6446
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.489E-06	0.3487
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.398E-09	0.0008
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.044E-09	0.0012
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.857E-09	0.0004
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.269E-06	1.0000

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

Maintenance Worker
RESRAD Output Files

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Maintenance Worker
File : C:\USERS\H5TDERJC\DESKTOP\NFSS\02 - VPH\13 - RISK ASSESSMENT\04 - RESRAD\FINAL\MW SURFACE SOIL.RAD

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Part I: Mixture Sums and Single Radionuclide Guidelines

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Maintenance Worker
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Dose Conversion Factor (and Related) Parameter Summary
Dose Library: ICRP 72 (Adult)

Menu	Parameter	Current Value#	Base Case*	Parameter Name
A-1	DCF's for external ground radiation, (mrem/yr)/(pCi/g)			
A-1	Ac-227 (Source: ICRP 60)	4.485E-04	4.485E-04	DCF1(1)
A-1	At-218 (Source: ICRP 60)	4.878E-03	4.878E-03	DCF1(2)
A-1	Bi-210 (Source: ICRP 60)	5.476E-03	5.476E-03	DCF1(3)
A-1	Bi-211 (Source: ICRP 60)	2.373E-01	2.373E-01	DCF1(4)
A-1	Bi-214 (Source: ICRP 60)	9.325E+00	9.325E+00	DCF1(5)
A-1	Fr-223 (Source: ICRP 60)	1.813E-01	1.813E-01	DCF1(6)
A-1	Pa-231 (Source: ICRP 60)	1.762E-01	1.762E-01	DCF1(7)
A-1	Pa-234 (Source: ICRP 60)	1.088E+01	1.088E+01	DCF1(8)
A-1	Pa-234m (Source: ICRP 60)	9.867E-02	9.867E-02	DCF1(9)
A-1	Pb-210 (Source: ICRP 60)	1.981E-03	1.981E-03	DCF1(10)
A-1	Pb-211 (Source: ICRP 60)	2.915E-01	2.915E-01	DCF1(11)
A-1	Pb-214 (Source: ICRP 60)	1.243E+00	1.243E+00	DCF1(12)
A-1	Po-210 (Source: ICRP 60)	4.934E-05	4.934E-05	DCF1(13)
A-1	Po-211 (Source: ICRP 60)	4.485E-02	4.485E-02	DCF1(14)
A-1	Po-214 (Source: ICRP 60)	4.840E-04	4.840E-04	DCF1(15)
A-1	Po-215 (Source: ICRP 60)	9.456E-04	9.456E-04	DCF1(16)
A-1	Po-218 (Source: ICRP 60)	5.326E-05	5.326E-05	DCF1(17)
A-1	Ra-223 (Source: ICRP 60)	5.532E-01	5.532E-01	DCF1(18)
A-1	Ra-226 (Source: ICRP 60)	2.915E-02	2.915E-02	DCF1(19)
A-1	Rn-219 (Source: ICRP 60)	2.859E-01	2.859E-01	DCF1(20)
A-1	Rn-222 (Source: ICRP 60)	2.186E-03	2.186E-03	DCF1(21)
A-1	Th-227 (Source: ICRP 60)	4.803E-01	4.803E-01	DCF1(22)
A-1	Th-230 (Source: ICRP 60)	1.071E-03	1.071E-03	DCF1(23)
A-1	Th-231 (Source: ICRP 60)	3.214E-02	3.214E-02	DCF1(24)
A-1	Th-234 (Source: ICRP 60)	2.130E-02	2.130E-02	DCF1(25)
A-1	Tl-207 (Source: ICRP 60)	2.299E-02	2.299E-02	DCF1(26)
A-1	Tl-210 (Source: ICRP 60)	1.661E+01	1.661E+01	DCF1(27)
A-1	U-234 (Source: ICRP 60)	3.439E-04	3.439E-04	DCF1(28)
A-1	U-235 (Source: ICRP 60)	6.597E-01	6.597E-01	DCF1(29)
A-1	U-238 (Source: ICRP 60)	7.961E-05	7.961E-05	DCF1(30)
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	2.104E+00	2.035E+00	DCF2(1)
B-1	Pa-231	5.180E-01	5.180E-01	DCF2(2)
B-1	Pb-210+D	3.697E-02	2.072E-02	DCF2(3)
B-1	Ra-226+D	3.526E-02	3.515E-02	DCF2(4)
B-1	Th-230	3.700E-01	3.700E-01	DCF2(5)
B-1	U-234	3.478E-02	3.478E-02	DCF2(6)
B-1	U-235+D	3.145E-02	3.145E-02	DCF2(7)
B-1	U-238	2.960E-02	2.960E-02	DCF2(8)
B-1	U-238+D	2.963E-02	2.960E-02	DCF2(9)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	4.473E-03	4.070E-03	DCF3(1)
D-1	Pa-231	2.627E-03	2.627E-03	DCF3(2)
D-1	Pb-210+D	6.998E-03	2.553E-03	DCF3(3)
D-1	Ra-226+D	1.037E-03	1.036E-03	DCF3(4)
D-1	Th-230	7.770E-04	7.770E-04	DCF3(5)
D-1	U-234	1.813E-04	1.813E-04	DCF3(6)

Dose Conversion Factor (and Related) Parameter Summary (continued)
Dose Library: ICRP 72 (Adult)

Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-1	U-235+D	1.752E-04	1.739E-04	DCF3(7)
D-1	U-238	1.665E-04	1.665E-04	DCF3(8)
D-1	U-238+D	1.791E-04	1.665E-04	DCF3(9)
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	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(2,1)
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(2,2)
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(2,3)
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(3,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(3,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(3,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(4,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(4,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(4,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(5,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(5,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(5,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(6,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(6,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(6,3)
D-34				
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(7,1)
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(7,2)
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(7,3)
D-34				
D-34	U-238 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(8,1)
D-34	U-238 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(8,2)
D-34	U-238 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(8,3)
D-34				
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(9,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(9,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(9,3)
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	Pa-231 , fish	1.000E+01	1.000E+01	BIOFAC(2,1)
D-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(2,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(3,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(3,2)

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Dose Conversion Factor (and Related) Parameter Summary (continued)

Dose Library: ICRP 72 (Adult)

Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(4,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(4,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(5,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(5,2)
D-5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(6,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(6,2)
D-5				
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIOFAC(7,1)
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(7,2)
D-5				
D-5	U-238 , fish	1.000E+01	1.000E+01	BIOFAC(8,1)
D-5	U-238 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(8,2)
D-5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(9,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(9,2)

#For DCF1(xxx) only, factors are for infinite depth & area. See ETFG table in Ground Pathway of Detailed Report.

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

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Site-Specific Parameter Summary

Menu	Parameter	User Input	Used by RESRAD Default	(If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.620E+04	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	1.500E-01	2.000E+00	---	THICK0
R011	Fraction of contamination that is submerged	0.000E+00	0.000E+00	---	SUBMFRACT
R011	Length parallel to aquifer flow (m)	not used	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Ac-227	1.000E+00	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g): Pa-231	1.000E+00	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Pb-210	1.000E+00	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): Ra-226	1.000E+00	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Th-230	1.000E+00	0.000E+00	---	S1(5)
R012	Initial principal radionuclide (pCi/g): U-234	1.000E+00	0.000E+00	---	S1(6)
R012	Initial principal radionuclide (pCi/g): U-235	1.000E+00	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): U-238	1.000E+00	0.000E+00	---	S1(8)
R012	Concentration in groundwater (pCi/L): Ac-227	not used	0.000E+00	---	W1(1)
R012	Concentration in groundwater (pCi/L): Pa-231	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Pb-210	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	W1(4)
R012	Concentration in groundwater (pCi/L): Th-230	not used	0.000E+00	---	W1(5)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(6)
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	---	W1(7)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(8)
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)	1.700E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	6.000E-05	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.200E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	3.600E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	6.840E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	1.040E+01	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	4.400E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	9.000E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	4.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	not used	1.000E+06	---	WAREA

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R013	Accuracy for water/soil computations	not used	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	not used	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	not used	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	not used	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	not used	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	not used	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	not used	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	not used	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	not used	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	not used	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	not used	2.500E+02	---	UW
R015	Number of unsaturated zone strata	not used	1	---	NS
R015	Unsat. zone 1, thickness (m)	not used	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	not used	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	not used	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	not used	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	not used	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	not used	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	not used	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Ac-227				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	not used	2.000E+01	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	not used	2.000E+01	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.179E-02	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for Pa-231				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.890E-02	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Pb-210				
R016	Contaminated zone (cm**3/g)	2.100E+03	1.000E+02	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	not used	1.000E+02	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	6.909E-04	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	3.800E+04	7.000E+01	---	DCNUCC(4)
R016	Unsaturated zone 1 (cm**3/g)	not used	7.000E+01	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.818E-05	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Th-230				
R016	Contaminated zone (cm**3/g)	4.500E+03	6.000E+04	---	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	not used	6.000E+04	---	DCNUCU(5,1)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.224E-04	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(6)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.890E-02	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R016	Distribution coefficients for U-235				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(7)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(7,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.890E-02	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	2.800E+01	5.000E+01	---	DCNUCC(8)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(8,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.143E-02	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R017	Inhalation rate (m**3/yr)	2.000E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	2.500E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	2.300E-02	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)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	not used	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	not used	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	not used	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	not used	-1	---	FPLANT
R018	Contamination fraction of meat	not used	-1	---	FMEAT
R018	Contamination fraction of milk	not used	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	not used	5.000E-01	---	LSI
R019	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	not used	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	not used	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	not used	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	not used	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	not used	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	not used	8.000E-02	---	TE(3)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	not used	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	not used	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	not used	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
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

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Used by RESRAD Default	(If different from user input)	Parameter Name
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	257	---	---	KYMAX

Summary of Pathway Selections

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

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Maintenance Worker

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Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	16200.00 square meters	Ac-227	1.000E+00
Thickness:	0.15 meters	Pa-231	1.000E+00
Cover Depth:	0.00 meters	Pb-210	1.000E+00
		Ra-226	1.000E+00
		Th-230	1.000E+00
		U-234	1.000E+00
		U-235	1.000E+00
		U-238	1.000E+00

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):	2.957E-01	2.914E-01	2.838E-01	2.645E-01	2.389E-01	2.179E-01	2.067E-01	1.646E-01
M(t):	1.183E-02	1.166E-02	1.135E-02	1.058E-02	9.555E-03	8.715E-03	8.267E-03	6.583E-03

Maximum TDOSE(t): 2.957E-01 mrem/yr at t = 0.000E+00 years

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Maintenance Worker
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Ac-227	3.804E-02	0.1286	7.397E-03	0.0250	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.566E-03	0.0121
Pa-231	4.342E-03	0.0147	2.009E-03	0.0068	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.231E-03	0.0075
Pb-210	1.645E-04	0.0006	1.347E-04	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.781E-03	0.0196
Ra-226	2.100E-01	0.7101	1.326E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.604E-04	0.0032
Th-230	6.930E-05	0.0002	1.369E-03	0.0046	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.523E-04	0.0022
U-234	7.592E-06	0.0000	1.269E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.500E-04	0.0005
U-235	1.492E-02	0.0505	1.148E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.449E-04	0.0005
U-238	3.165E-03	0.0107	1.069E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.465E-04	0.0005
Total	2.707E-01	0.9154	1.139E-02	0.0385	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.363E-02	0.0461

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 mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.900E-02	0.1657
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.581E-03	0.0290
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.080E-03	0.0206
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.111E-01	0.7138
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.091E-03	0.0071
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.845E-04	0.0010
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.518E-02	0.0513
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.418E-03	0.0116
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.957E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Maintenance Worker
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 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.
Ac-227	3.429E-02	0.1177	6.666E-03	0.0229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.214E-03	0.0110
Pa-231	5.352E-03	0.0184	2.171E-03	0.0074	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.272E-03	0.0078
Pb-210	1.593E-04	0.0005	1.304E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.598E-03	0.0192
Ra-226	2.099E-01	0.7201	1.366E-04	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.136E-03	0.0039
Th-230	1.602E-04	0.0005	1.368E-03	0.0047	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.522E-04	0.0022
U-234	7.377E-06	0.0000	1.232E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.457E-04	0.0005
U-235	1.449E-02	0.0497	1.115E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.408E-04	0.0005
U-238	3.006E-03	0.0103	1.015E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.391E-04	0.0005
Total	2.673E-01	0.9173	1.081E-02	0.0371	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.330E-02	0.0456

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.417E-02	0.1516
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.795E-03	0.0336
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.888E-03	0.0202
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.111E-01	0.7244
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.181E-03	0.0075
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.763E-04	0.0009
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.475E-02	0.0506
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.246E-03	0.0111
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.914E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Maintenance Worker
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 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.
Ac-227	2.787E-02	0.0982	5.414E-03	0.0191	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.610E-03	0.0092
Pa-231	6.964E-03	0.0245	2.419E-03	0.0085	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.322E-03	0.0082
Pb-210	1.495E-04	0.0005	1.223E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.249E-03	0.0185
Ra-226	2.096E-01	0.7386	1.442E-04	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.471E-03	0.0052
Th-230	3.417E-04	0.0012	1.367E-03	0.0048	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.524E-04	0.0023
U-234	6.967E-06	0.0000	1.163E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.374E-04	0.0005
U-235	1.368E-02	0.0482	1.052E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.329E-04	0.0005
U-238	2.712E-03	0.0096	9.150E-05	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.254E-04	0.0004
Total	2.613E-01	0.9208	9.779E-03	0.0345	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.270E-02	0.0447

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.590E-02	0.1265
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.171E-02	0.0412
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.521E-03	0.0195
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.112E-01	0.7442
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.361E-03	0.0083
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.606E-04	0.0009
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.392E-02	0.0490
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.929E-03	0.0103
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.838E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Maintenance Worker
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 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.
Ac-227	1.349E-02	0.0510	2.614E-03	0.0099	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.260E-03	0.0048
Pa-231	9.635E-03	0.0364	2.735E-03	0.0103	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.260E-03	0.0085
Pb-210	1.197E-04	0.0005	9.765E-05	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.191E-03	0.0158
Ra-226	2.088E-01	0.7895	1.671E-04	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.482E-03	0.0094
Th-230	9.741E-04	0.0037	1.360E-03	0.0051	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.551E-04	0.0025
U-234	5.729E-06	0.0000	9.478E-05	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.120E-04	0.0004
U-235	1.117E-02	0.0422	8.609E-05	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.085E-04	0.0004
U-238	1.891E-03	0.0071	6.366E-05	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.725E-05	0.0003
Total	2.461E-01	0.9305	7.218E-03	0.0273	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.116E-02	0.0422

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.736E-02	0.0657
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.463E-02	0.0553
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.408E-03	0.0167
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.115E-01	0.7995
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.989E-03	0.0113
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.125E-04	0.0008
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.137E-02	0.0430
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.042E-03	0.0077
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.645E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Maintenance Worker
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 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.
Ac-227	1.696E-03	0.0071	3.264E-04	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.574E-04	0.0007
Pa-231	7.895E-03	0.0330	2.002E-03	0.0084	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.489E-03	0.0062
Pb-210	6.337E-05	0.0003	5.131E-05	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.202E-03	0.0092
Ra-226	2.064E-01	0.8642	2.085E-04	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.341E-03	0.0182
Th-230	2.757E-03	0.0115	1.342E-03	0.0056	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.758E-04	0.0028
U-234	3.481E-06	0.0000	5.293E-05	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.239E-05	0.0003
U-235	6.267E-03	0.0262	4.868E-05	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.101E-05	0.0003
U-238	6.750E-04	0.0028	2.258E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.094E-05	0.0001
Total	2.258E-01	0.9453	4.054E-03	0.0170	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.020E-03	0.0378

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.180E-03	0.0091
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.139E-02	0.0477
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.317E-03	0.0097
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.110E-01	0.8833
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.774E-03	0.0200
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.188E-04	0.0005
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.377E-03	0.0267
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.285E-04	0.0030
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.389E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Maintenance Worker
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 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.
Ac-227	1.195E-06	0.0000	2.244E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.082E-07	0.0000
Pa-231	1.133E-03	0.0052	2.747E-04	0.0013	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.997E-04	0.0009
Pb-210	6.847E-06	0.0000	5.392E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.314E-04	0.0011
Ra-226	1.982E-01	0.9097	2.386E-04	0.0011	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.907E-03	0.0271
Th-230	8.711E-03	0.0400	1.281E-03	0.0059	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.032E-04	0.0037
U-234	2.269E-06	0.0000	7.150E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.221E-06	0.0000
U-235	8.286E-04	0.0038	6.659E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.135E-06	0.0000
U-238	1.834E-05	0.0001	6.000E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.222E-07	0.0000
Total	2.089E-01	0.9588	1.814E-03	0.0083	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.159E-03	0.0329

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.528E-06	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.608E-03	0.0074
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.436E-04	0.0011
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.043E-01	0.9379
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.080E-02	0.0495
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.764E-05	0.0001
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.434E-04	0.0039
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.977E-05	0.0001
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.179E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Maintenance Worker
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 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.
Ac-227	1.177E-15	0.0000	2.054E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.901E-17	0.0000
Pa-231	3.440E-06	0.0000	7.753E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.634E-07	0.0000
Pb-210	1.186E-08	0.0000	8.592E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.688E-07	0.0000
Ra-226	1.757E-01	0.8501	2.035E-04	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.119E-03	0.0248
Th-230	2.338E-02	0.1131	1.116E-03	0.0054	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.136E-03	0.0055
U-234	6.525E-06	0.0000	3.699E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.561E-07	0.0000
U-235	2.552E-06	0.0000	2.215E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.543E-08	0.0000
U-238	9.506E-10	0.0000	4.056E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.625E-11	0.0000
Total	1.991E-01	0.9633	1.321E-03	0.0064	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.256E-03	0.0303

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.481E-15	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.779E-06	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.892E-07	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.810E-01	0.8759
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.563E-02	0.1240
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.251E-06	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.599E-06	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.037E-09	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.067E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Maintenance Worker
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pa-231	5.064E-15	0.0000	8.545E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.210E-16	0.0000
Pb-210	2.522E-18	0.0000	1.283E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.508E-17	0.0000
Ra-226	1.091E-01	0.6630	9.972E-05	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.509E-03	0.0152
Th-230	5.078E-02	0.3086	6.353E-04	0.0039	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.414E-03	0.0086
U-234	1.548E-05	0.0001	1.997E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.334E-07	0.0000
U-235	3.977E-15	0.0000	3.753E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.772E-17	0.0000
U-238	8.424E-10	0.0000	1.106E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.367E-11	0.0000
Total	1.599E-01	0.9717	7.352E-04	0.0045	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.923E-03	0.0238

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.540E-15	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.888E-17	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.117E-01	0.6789
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.283E-02	0.3210
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.611E-05	0.0001
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.052E-15	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.771E-10	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.646E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Maintenance Worker
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Dose/Source Ratios Summed Over All Pathways
Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g) 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-227+D	Ac-227+D	1.000E+00	4.900E-02	4.417E-02	3.590E-02	1.736E-02	2.180E-03	1.528E-06	1.481E-15	0.000E+00
Pa-231	Pa-231	1.000E+00	7.795E-03	7.571E-03	7.143E-03	5.824E-03	3.251E-03	4.222E-04	1.235E-06	1.591E-15
Pa-231	Ac-227+D	1.000E+00	7.858E-04	2.223E-03	4.563E-03	8.806E-03	8.135E-03	1.185E-03	3.544E-06	4.948E-15
Pa-231	äDSR(j)		8.581E-03	9.795E-03	1.171E-02	1.463E-02	1.139E-02	1.608E-03	4.779E-06	6.540E-15
Pb-210+D	Pb-210+D	1.000E+00	6.080E-03	5.888E-03	5.521E-03	4.408E-03	2.317E-03	2.436E-04	3.892E-07	5.888E-17
Ra-226+D	Ra-226+D	1.000E+00	2.110E-01	2.108E-01	2.106E-01	2.097E-01	2.073E-01	1.990E-01	1.763E-01	1.094E-01
Ra-226+D	Pb-210+D	1.000E+00	9.498E-05	2.808E-04	6.345E-04	1.703E-03	3.676E-03	5.380E-03	4.701E-03	2.334E-03
Ra-226+D	äDSR(j)		2.111E-01	2.111E-01	2.112E-01	2.115E-01	2.110E-01	2.043E-01	1.810E-01	1.117E-01
Th-230	Th-230	1.000E+00	2.045E-03	2.044E-03	2.041E-03	2.030E-03	2.001E-03	1.900E-03	1.632E-03	8.871E-04
Th-230	Ra-226+D	1.000E+00	4.570E-05	1.370E-04	3.194E-04	9.548E-04	2.745E-03	8.723E-03	2.344E-02	5.090E-02
Th-230	Pb-210+D	1.000E+00	1.375E-08	9.533E-08	4.932E-07	4.090E-06	2.813E-05	1.713E-04	5.575E-04	1.049E-03
Th-230	äDSR(j)		2.091E-03	2.181E-03	2.361E-03	2.989E-03	4.774E-03	1.080E-02	2.563E-02	5.283E-02
U-234	U-234	1.000E+00	2.845E-04	2.763E-04	2.605E-04	2.122E-04	1.181E-04	1.519E-05	4.313E-08	4.877E-17
U-234	Th-230	1.000E+00	9.117E-09	2.699E-08	6.117E-08	1.658E-07	3.667E-07	5.649E-07	5.141E-07	2.795E-07
U-234	Ra-226+D	1.000E+00	1.361E-10	9.449E-10	4.899E-09	4.097E-08	2.878E-07	1.848E-06	6.541E-06	1.551E-05
U-234	Pb-210+D	1.000E+00	3.082E-14	4.561E-13	5.164E-12	1.230E-10	2.236E-09	3.237E-08	1.531E-07	3.193E-07
U-234	äDSR(j)		2.845E-04	2.763E-04	2.606E-04	2.125E-04	1.188E-04	1.764E-05	7.251E-06	1.611E-05
U-235+D	U-235+D	1.000E+00	1.518E-02	1.475E-02	1.392E-02	1.137E-02	6.371E-03	8.403E-04	2.570E-06	3.914E-15
U-235+D	Pa-231	1.000E+00	8.207E-08	2.399E-07	5.286E-07	1.294E-06	2.098E-06	8.988E-07	7.877E-09	3.404E-17
U-235+D	Ac-227+D	1.000E+00	5.563E-09	3.719E-08	1.773E-07	1.105E-06	3.546E-06	2.188E-06	2.159E-08	1.044E-16
U-235+D	äDSR(j)		1.518E-02	1.475E-02	1.392E-02	1.137E-02	6.377E-03	8.434E-04	2.599E-06	4.052E-15
U-238	U-238	5.400E-05	1.322E-08	1.255E-08	1.131E-08	7.872E-09	2.792E-09	7.412E-11	2.318E-15	3.671E-31
U-238+D	U-238+D	9.999E-01	3.418E-03	3.246E-03	2.928E-03	2.042E-03	7.285E-04	1.976E-05	6.591E-10	1.356E-25
U-238+D	U-234	9.999E-01	3.983E-10	1.153E-09	2.484E-09	5.624E-09	7.387E-09	1.713E-09	5.420E-12	6.136E-21
U-238+D	Th-230	9.999E-01	8.526E-15	5.831E-14	2.925E-13	2.175E-12	1.112E-11	2.920E-11	2.851E-11	1.551E-11
U-238+D	Ra-226+D	9.999E-01	9.564E-17	1.410E-15	1.583E-14	3.658E-13	6.173E-12	7.646E-11	3.365E-10	8.442E-10
U-238+D	Pb-210+D	9.999E-01	1.736E-20	5.276E-19	1.273E-17	8.511E-16	3.915E-14	1.228E-12	7.795E-12	1.737E-11
U-238+D	äDSR(j)		3.418E-03	3.246E-03	2.928E-03	2.042E-03	7.285E-04	1.977E-05	1.037E-09	8.771E-10

The DSR includes contributions from associated (half-life ó 180 days) daughters.

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Maintenance Worker
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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
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Ac-227 5.102E+02 5.660E+02 6.965E+02 1.440E+03 1.147E+04 1.636E+07 *7.232E+13 *7.232E+13
Pa-231 2.913E+03 2.552E+03 2.136E+03 1.709E+03 2.196E+03 1.555E+04 5.232E+06 *4.723E+10
Pb-210 4.112E+03 4.246E+03 4.528E+03 5.672E+03 1.079E+04 1.026E+05 6.423E+07 *7.634E+13
Ra-226 1.184E+02 1.184E+02 1.183E+02 1.182E+02 1.185E+02 1.223E+02 1.381E+02 2.237E+02
Th-230 1.196E+04 1.146E+04 1.059E+04 8.363E+03 5.236E+03 2.316E+03 9.753E+02 4.732E+02
U-234 8.788E+04 9.048E+04 9.593E+04 1.177E+05 2.104E+05 1.417E+06 3.448E+06 1.552E+06
U-235 1.647E+03 1.695E+03 1.796E+03 2.199E+03 3.920E+03 2.964E+04 *2.161E+06 *2.161E+06
U-238 7.314E+03 7.701E+03 8.537E+03 1.224E+04 3.432E+04 *3.361E+05 *3.361E+05 *3.361E+05
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*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) (pCi/g)	G(i,tmin) (pCi/g)	DSR(i,tmax) (pCi/g)	G(i,tmax) (pCi/g)
Ac-227	1.000E+00	0.000E+00	4.900E-02	5.102E+02	4.900E-02	5.102E+02
Pa-231	1.000E+00	12.43 ñ 0.02	1.478E-02	1.692E+03	8.581E-03	2.913E+03
Pb-210	1.000E+00	0.000E+00	6.080E-03	4.112E+03	6.080E-03	4.112E+03
Ra-226	1.000E+00	13.16 ñ 0.03	2.115E-01	1.182E+02	2.111E-01	1.184E+02
Th-230	1.000E+00	1.000E+03	5.283E-02	4.732E+02	2.091E-03	1.196E+04
U-234	1.000E+00	0.000E+00	2.845E-04	8.788E+04	2.845E-04	8.788E+04
U-235	1.000E+00	0.000E+00	1.518E-02	1.647E+03	1.518E-02	1.647E+03
U-238	1.000E+00	0.000E+00	3.418E-03	7.314E+03	3.418E-03	7.314E+03

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Summary : NFSS VP H Prime Surface Soil (0-0.15m) Maintenance Worker
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Individual Nuclide Dose Summed Over All Pathways
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	DOSE(j,t), mrem/yr t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-227	Ac-227	1.000E+00	4.900E-02	4.417E-02	3.590E-02	1.736E-02	2.180E-03	1.528E-06	1.481E-15	0.000E+00
Ac-227	Pa-231	1.000E+00	7.858E-04	2.223E-03	4.563E-03	8.806E-03	8.135E-03	1.185E-03	3.544E-06	4.948E-15
Ac-227	U-235	1.000E+00	5.563E-09	3.719E-08	1.773E-07	1.105E-06	3.546E-06	2.188E-06	2.159E-08	1.044E-16
Ac-227	äDOSE(j)		4.979E-02	4.640E-02	4.046E-02	2.617E-02	1.032E-02	1.189E-03	3.565E-06	5.053E-15
Pa-231	Pa-231	1.000E+00	7.795E-03	7.571E-03	7.143E-03	5.824E-03	3.251E-03	4.222E-04	1.235E-06	1.591E-15
Pa-231	U-235	1.000E+00	8.207E-08	2.399E-07	5.286E-07	1.294E-06	2.098E-06	8.988E-07	7.877E-09	3.404E-17
Pa-231	äDOSE(j)		7.795E-03	7.572E-03	7.143E-03	5.825E-03	3.253E-03	4.231E-04	1.243E-06	1.625E-15
Pb-210	Pb-210	1.000E+00	6.080E-03	5.888E-03	5.521E-03	4.408E-03	2.317E-03	2.436E-04	3.892E-07	5.888E-17
Pb-210	Ra-226	1.000E+00	9.498E-05	2.808E-04	6.345E-04	1.703E-03	3.676E-03	5.380E-03	4.701E-03	2.334E-03
Pb-210	Th-230	1.000E+00	1.375E-08	9.533E-08	4.932E-07	4.090E-06	2.813E-05	1.713E-04	5.575E-04	1.049E-03
Pb-210	U-234	1.000E+00	3.082E-14	4.561E-13	5.164E-12	1.230E-10	2.236E-09	3.237E-08	1.531E-07	3.193E-07
Pb-210	U-238	9.999E-01	1.736E-20	5.276E-19	1.273E-17	8.511E-16	3.915E-14	1.228E-12	7.795E-12	1.737E-11
Pb-210	äDOSE(j)		6.175E-03	6.169E-03	6.156E-03	6.115E-03	6.020E-03	5.795E-03	5.259E-03	3.383E-03
Ra-226	Ra-226	1.000E+00	2.110E-01	2.108E-01	2.106E-01	2.097E-01	2.073E-01	1.990E-01	1.763E-01	1.094E-01
Ra-226	Th-230	1.000E+00	4.570E-05	1.370E-04	3.194E-04	9.548E-04	2.745E-03	8.723E-03	2.344E-02	5.090E-02
Ra-226	U-234	1.000E+00	1.361E-10	9.449E-10	4.899E-09	4.097E-08	2.878E-07	1.848E-06	6.541E-06	1.551E-05
Ra-226	U-238	9.999E-01	9.564E-17	1.410E-15	1.583E-14	3.658E-13	6.173E-12	7.646E-11	3.365E-10	8.442E-10
Ra-226	äDOSE(j)		2.110E-01	2.110E-01	2.109E-01	2.107E-01	2.101E-01	2.077E-01	1.998E-01	1.603E-01
Th-230	Th-230	1.000E+00	2.045E-03	2.044E-03	2.041E-03	2.030E-03	2.001E-03	1.900E-03	1.632E-03	8.871E-04
Th-230	U-234	1.000E+00	9.117E-09	2.699E-08	6.117E-08	1.658E-07	3.667E-07	5.649E-07	5.141E-07	2.795E-07
Th-230	U-238	9.999E-01	8.526E-15	5.831E-14	2.925E-13	2.175E-12	1.112E-11	2.920E-11	2.851E-11	1.551E-11
Th-230	äDOSE(j)		2.045E-03	2.044E-03	2.041E-03	2.031E-03	2.001E-03	1.901E-03	1.632E-03	8.874E-04
U-234	U-234	1.000E+00	2.845E-04	2.763E-04	2.605E-04	2.122E-04	1.181E-04	1.519E-05	4.313E-08	4.877E-17
U-234	U-238	9.999E-01	3.983E-10	1.153E-09	2.484E-09	5.624E-09	7.387E-09	1.713E-09	5.420E-12	6.136E-21
U-234	äDOSE(j)		2.845E-04	2.763E-04	2.606E-04	2.123E-04	1.182E-04	1.520E-05	4.313E-08	4.878E-17
U-235	U-235	1.000E+00	1.518E-02	1.475E-02	1.392E-02	1.137E-02	6.371E-03	8.403E-04	2.570E-06	3.914E-15
U-238	U-238	5.400E-05	1.322E-08	1.255E-08	1.131E-08	7.872E-09	2.792E-09	7.412E-11	2.318E-15	0.000E+00
U-238	U-238	9.999E-01	3.418E-03	3.246E-03	2.928E-03	2.042E-03	7.285E-04	1.976E-05	6.591E-10	1.356E-25
U-238	äDOSE(j)		3.418E-03	3.246E-03	2.929E-03	2.042E-03	7.285E-04	1.976E-05	6.591E-10	1.356E-25

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

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Maintenance Worker
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Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-227	Ac-227	1.000E+00	1.000E+00	9.016E-01	7.328E-01	3.548E-01	4.466E-02	3.160E-05	3.155E-14	1.401E-45
Ac-227	Pa-231	1.000E+00	0.000E+00	2.980E-02	7.845E-02	1.679E-01	1.599E-01	2.363E-02	7.275E-05	1.176E-13
Ac-227	U-235	1.000E+00	0.000E+00	3.192E-07	2.583E-06	1.996E-05	6.832E-05	4.337E-05	4.425E-07	2.481E-15
Ac-227	äS(j):		1.000E+00	9.314E-01	8.113E-01	5.227E-01	2.047E-01	2.370E-02	7.319E-05	1.201E-13
Pa-231	Pa-231	1.000E+00	1.000E+00	9.715E-01	9.169E-01	7.489E-01	4.200E-01	5.547E-02	1.707E-04	2.760E-13
Pa-231	U-235	1.000E+00	0.000E+00	2.056E-05	5.820E-05	1.585E-04	2.667E-04	1.175E-04	1.087E-06	5.902E-15
Pa-231	äS(j):		1.000E+00	9.715E-01	9.170E-01	7.490E-01	4.202E-01	5.559E-02	1.718E-04	2.819E-13
Pb-210	Pb-210	1.000E+00	1.000E+00	9.687E-01	9.091E-01	7.278E-01	3.855E-01	4.170E-02	7.249E-05	1.588E-14
Pb-210	Ra-226	1.000E+00	0.000E+00	3.059E-02	8.888E-02	2.656E-01	5.962E-01	9.059E-01	8.620E-01	6.198E-01
Pb-210	Th-230	1.000E+00	0.000E+00	6.660E-06	5.867E-05	6.056E-04	4.479E-03	2.866E-02	1.020E-01	2.784E-01
Pb-210	U-234	1.000E+00	0.000E+00	1.990E-11	5.210E-10	1.736E-08	3.510E-07	5.402E-06	2.802E-05	8.474E-05
Pb-210	U-238	9.999E-01	0.000E+00	1.400E-17	1.084E-15	1.146E-13	6.063E-12	2.044E-10	1.426E-09	4.608E-09
Pb-210	äS(j):		1.000E+00	9.993E-01	9.980E-01	9.940E-01	9.862E-01	9.762E-01	9.641E-01	8.982E-01
Ra-226	Ra-226	1.000E+00	1.000E+00	9.995E-01	9.986E-01	9.953E-01	9.860E-01	9.540E-01	8.681E-01	6.241E-01
Ra-226	Th-230	1.000E+00	0.000E+00	4.330E-04	1.298E-03	4.315E-03	1.284E-02	4.162E-02	1.152E-01	2.902E-01
Ra-226	U-234	1.000E+00	0.000E+00	1.931E-09	1.704E-08	1.770E-07	1.330E-06	8.800E-06	3.214E-05	8.845E-05
Ra-226	U-238	9.999E-01	0.000E+00	1.806E-15	4.683E-14	1.511E-12	2.818E-11	3.634E-10	1.653E-09	4.814E-09
Ra-226	äS(j):		1.000E+00	1.000E+00	9.999E-01	9.996E-01	9.988E-01	9.956E-01	9.834E-01	9.144E-01
Th-230	Th-230	1.000E+00	1.000E+00	9.997E-01	9.990E-01	9.967E-01	9.901E-01	9.674E-01	9.054E-01	7.179E-01
Th-230	U-234	1.000E+00	0.000E+00	8.872E-06	2.586E-05	7.804E-05	1.796E-04	2.873E-04	2.852E-04	2.262E-04
Th-230	U-238	9.999E-01	0.000E+00	1.242E-11	1.060E-10	9.805E-10	5.386E-09	1.484E-08	1.582E-08	1.255E-08
Th-230	äS(j):		1.000E+00	9.997E-01	9.990E-01	9.968E-01	9.903E-01	9.677E-01	9.056E-01	7.181E-01
U-234	U-234	1.000E+00	1.000E+00	9.715E-01	9.170E-01	7.490E-01	4.202E-01	5.558E-02	1.717E-04	2.811E-13
U-234	U-238	9.999E-01	0.000E+00	2.723E-06	7.540E-06	1.901E-05	2.598E-05	6.258E-06	2.157E-08	3.537E-17
U-234	äS(j):		1.000E+00	9.715E-01	9.170E-01	7.490E-01	4.202E-01	5.558E-02	1.717E-04	2.811E-13
U-235	U-235	1.000E+00	1.000E+00	9.715E-01	9.170E-01	7.490E-01	4.202E-01	5.559E-02	1.718E-04	2.819E-13
U-238	U-238	5.400E-05	5.400E-05	5.129E-05	4.628E-05	3.229E-05	1.154E-05	3.153E-07	1.075E-11	2.488E-27
U-238	U-238	9.999E-01	9.999E-01	9.498E-01	8.570E-01	5.979E-01	2.137E-01	5.839E-03	1.991E-07	4.607E-23
U-238	äS(j):		1.000E+00	9.499E-01	8.570E-01	5.979E-01	2.137E-01	5.839E-03	1.991E-07	4.608E-23

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

RESCALC.EXE execution time = 2.33 seconds

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Part III: Intake Quantities and Health Risk Factors

Cancer Risk Slope Factors Summary Table
Risk Library: FGR 13 Morbidity

Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-1	Ground external radiation slope factors, 1/yr per (pCi/g):			
Sf-1	Ac-227+D	1.47E-06	3.48E-10	SLPF(1,1)
Sf-1	Pa-231	1.39E-07	1.39E-07	SLPF(2,1)
Sf-1	Pb-210+D	4.21E-09	1.41E-09	SLPF(3,1)
Sf-1	Ra-226+D	8.49E-06	2.29E-08	SLPF(4,1)
Sf-1	Th-230	8.19E-10	8.19E-10	SLPF(5,1)
Sf-1	U-234	2.52E-10	2.52E-10	SLPF(6,1)
Sf-1	U-235+D	5.43E-07	5.18E-07	SLPF(7,1)
Sf-1	U-238	4.99E-11	4.99E-11	SLPF(8,1)
Sf-1	U-238+D	1.14E-07	4.99E-11	SLPF(9,1)
Sf-2	Inhalation, slope factors, 1/(pCi):			
Sf-2	Ac-227+D	2.13E-07	1.49E-07	SLPF(1,2)
Sf-2	Pa-231	7.62E-08	7.62E-08	SLPF(2,2)
Sf-2	Pb-210+D	3.08E-08	1.58E-08	SLPF(3,2)
Sf-2	Ra-226+D	2.83E-08	2.82E-08	SLPF(4,2)
Sf-2	Th-230	3.40E-08	3.40E-08	SLPF(5,2)
Sf-2	U-234	2.78E-08	2.78E-08	SLPF(6,2)
Sf-2	U-235+D	2.50E-08	2.50E-08	SLPF(7,2)
Sf-2	U-238	2.36E-08	2.36E-08	SLPF(8,2)
Sf-2	U-238+D	2.36E-08	2.36E-08	SLPF(9,2)
Sf-3	Food ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.53E-10	2.45E-10	SLPF(1,3)
Sf-3	Pa-231	2.26E-10	2.26E-10	SLPF(2,3)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF(3,3)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF(4,3)
Sf-3	Th-230	1.19E-10	1.19E-10	SLPF(5,3)
Sf-3	U-234	9.55E-11	9.55E-11	SLPF(6,3)
Sf-3	U-235+D	9.76E-11	9.44E-11	SLPF(7,3)
Sf-3	U-238	8.66E-11	8.66E-11	SLPF(8,3)
Sf-3	U-238+D	1.21E-10	8.66E-11	SLPF(9,3)
Sf-3	Water ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	4.86E-10	2.01E-10	SLPF(1,4)
Sf-3	Pa-231	1.73E-10	1.73E-10	SLPF(2,4)
Sf-3	Pb-210+D	2.66E-09	8.81E-10	SLPF(3,4)
Sf-3	Ra-226+D	3.86E-10	3.85E-10	SLPF(4,4)
Sf-3	Th-230	9.10E-11	9.10E-11	SLPF(5,4)
Sf-3	U-234	7.07E-11	7.07E-11	SLPF(6,4)
Sf-3	U-235+D	7.18E-11	6.96E-11	SLPF(7,4)
Sf-3	U-238	6.40E-11	6.40E-11	SLPF(8,4)
Sf-3	U-238+D	8.71E-11	6.40E-11	SLPF(9,4)
Sf-3	Soil ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.53E-10	2.45E-10	SLPF(1,5)
Sf-3	Pa-231	2.26E-10	2.26E-10	SLPF(2,5)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF(3,5)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF(4,5)
Sf-3	Th-230	1.19E-10	1.19E-10	SLPF(5,5)

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Cancer Risk Slope Factors Summary Table (continued)
Risk Library: FGR 13 Morbidity

Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-3	U-234	9.55E-11	9.55E-11	SLPF(6,5)
Sf-3	U-235+D	9.76E-11	9.44E-11	SLPF(7,5)
Sf-3	U-238	8.66E-11	8.66E-11	SLPF(8,5)
Sf-3	U-238+D	1.21E-10	8.66E-11	SLPF(9,5)
Sf-Rn	Radon Inhalation slope factors, 1/(pCi):			
Sf-Rn	Rn-222	1.80E-12	1.80E-12	SLPFRN(1,1)
Sf-Rn	Po-218	3.70E-12	3.70E-12	SLPFRN(1,2)
Sf-Rn	Pb-214	6.20E-12	6.20E-12	SLPFRN(1,3)
Sf-Rn	Bi-214	1.50E-11	1.50E-11	SLPFRN(1,4)
Sf-Rn	Radon K factors, (mrem/WLM):			
Sf-Rn	Rn-222 Indoor	3.88E+02	3.88E+02	KFACTR(1,1)
Sf-Rn	Rn-222 Outdoor	3.88E+02	3.88E+02	KFACTR(1,2)

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

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Maintenance Worker

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Risk Slope and Environmental Transport Factors for the Ground Pathway

Nuclide	Slope(i)*	ETFG(i,t) At Time in Years (dimensionless)							
(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
Ac-227	3.480E-10	2.213E-02	2.213E-02	2.213E-02	2.213E-02	2.212E-02	2.209E-02	2.197E-02	2.088E-02
At-218	3.570E-09	2.240E-02	2.240E-02	2.240E-02	2.240E-02	2.240E-02	2.242E-02	2.245E-02	2.254E-02
Bi-210	2.760E-09	2.214E-02	2.214E-02	2.214E-02	2.214E-02	2.213E-02	2.210E-02	2.198E-02	2.110E-02
Bi-211	1.880E-07	2.130E-02	2.130E-02	2.130E-02	2.129E-02	2.126E-02	2.116E-02	2.083E-02	1.881E-02
Bi-214	7.480E-06	1.960E-02	1.960E-02	1.960E-02	1.958E-02	1.953E-02	1.937E-02	1.884E-02	1.616E-02
Fr-223	1.400E-07	2.183E-02	2.183E-02	2.183E-02	2.182E-02	2.181E-02	2.175E-02	2.155E-02	2.011E-02
Pa-231	1.390E-07	2.149E-02	2.149E-02	2.149E-02	2.148E-02	2.145E-02	2.137E-02	2.107E-02	1.916E-02
Pa-234	8.710E-06	2.034E-02	2.034E-02	2.033E-02	2.032E-02	2.028E-02	2.014E-02	1.968E-02	1.721E-02
Pa-234m	6.870E-08	2.072E-02	2.072E-02	2.071E-02	2.070E-02	2.067E-02	2.055E-02	2.016E-02	1.808E-02
Pb-210	1.410E-09	2.262E-02	2.262E-02	2.263E-02	2.263E-02	2.263E-02	2.263E-02	2.264E-02	2.268E-02
Pb-211	2.290E-07	2.071E-02	2.070E-02	2.070E-02	2.069E-02	2.065E-02	2.053E-02	2.011E-02	1.776E-02
Pb-214	9.820E-07	2.130E-02	2.130E-02	2.130E-02	2.129E-02	2.126E-02	2.117E-02	2.084E-02	1.883E-02
Po-210	3.950E-11	2.031E-02	2.031E-02	2.031E-02	2.029E-02	2.025E-02	2.011E-02	1.965E-02	1.716E-02
Po-211	3.580E-08	2.042E-02	2.042E-02	2.041E-02	2.040E-02	2.036E-02	2.022E-02	1.978E-02	1.735E-02
Po-214	3.860E-10	2.036E-02	2.035E-02	2.035E-02	2.034E-02	2.030E-02	2.016E-02	1.971E-02	1.726E-02
Po-215	7.480E-10	2.102E-02	2.102E-02	2.102E-02	2.101E-02	2.098E-02	2.087E-02	2.049E-02	1.831E-02
Po-218	4.260E-11	2.030E-02	2.030E-02	2.030E-02	2.028E-02	2.024E-02	2.010E-02	1.963E-02	1.714E-02
Ra-223	4.340E-07	2.180E-02	2.180E-02	2.180E-02	2.179E-02	2.177E-02	2.171E-02	2.149E-02	1.991E-02
Ra-226	2.290E-08	2.182E-02	2.182E-02	2.182E-02	2.182E-02	2.180E-02	2.174E-02	2.153E-02	1.999E-02
Rn-219	2.250E-07	2.128E-02	2.128E-02	2.127E-02	2.126E-02	2.124E-02	2.114E-02	2.080E-02	1.876E-02
Rn-222	1.740E-09	2.094E-02	2.094E-02	2.094E-02	2.093E-02	2.089E-02	2.078E-02	2.039E-02	1.814E-02
Th-227	3.780E-07	2.162E-02	2.162E-02	2.161E-02	2.161E-02	2.159E-02	2.151E-02	2.125E-02	1.950E-02
Th-230	8.190E-10	2.225E-02	2.225E-02	2.225E-02	2.225E-02	2.224E-02	2.223E-02	2.218E-02	2.148E-02
Th-231	2.450E-08	2.231E-02	2.231E-02	2.231E-02	2.231E-02	2.231E-02	2.230E-02	2.225E-02	2.163E-02
Th-234	1.630E-08	2.231E-02	2.231E-02	2.231E-02	2.231E-02	2.231E-02	2.231E-02	2.228E-02	2.179E-02
Tl-207	1.520E-08	2.118E-02	2.118E-02	2.118E-02	2.117E-02	2.114E-02	2.105E-02	2.073E-02	1.892E-02
Tl-210	0.000E+00	2.018E-02	2.018E-02	2.017E-02	2.016E-02	2.011E-02	1.995E-02	1.941E-02	1.671E-02
U-234	2.520E-10	2.240E-02	2.240E-02	2.240E-02	2.240E-02	2.239E-02	2.239E-02	2.235E-02	2.183E-02
U-235	5.180E-07	2.186E-02	2.186E-02	2.185E-02	2.185E-02	2.183E-02	2.178E-02	2.157E-02	2.006E-02
U-238	4.990E-11	2.282E-02	2.282E-02	2.282E-02	2.282E-02	2.282E-02	2.283E-02	2.283E-02	2.285E-02

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

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

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	3.702E-03	0.000E+00	0.000E+00	0.000E+00	8.395E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.395E-01
Pa-231	3.702E-03	0.000E+00	0.000E+00	0.000E+00	8.395E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.395E-01
Pb-210	3.702E-03	0.000E+00	0.000E+00	0.000E+00	8.395E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.395E-01
Ra-226	3.702E-03	0.000E+00	0.000E+00	0.000E+00	8.395E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.395E-01
Th-230	3.702E-03	0.000E+00	0.000E+00	0.000E+00	8.395E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.395E-01
U-234	3.702E-03	0.000E+00	0.000E+00	0.000E+00	8.395E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.395E-01
U-235	3.702E-03	0.000E+00	0.000E+00	0.000E+00	8.395E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.395E-01
U-238	3.702E-03	0.000E+00	0.000E+00	0.000E+00	8.395E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.395E-01

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	3.994E-07	0.0795	9.976E-09	0.0020	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.939E-09	0.0014
Pa-231	5.314E-08	0.0106	5.000E-09	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.363E-09	0.0007
Pb-210	2.329E-09	0.0005	2.813E-09	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.141E-08	0.0142
Ra-226	4.194E-06	0.8353	2.602E-09	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.074E-08	0.0021
Th-230	4.536E-10	0.0001	3.118E-09	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.475E-09	0.0005
U-234	1.005E-10	0.0000	1.824E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.421E-09	0.0003
U-235	2.112E-07	0.0421	1.641E-09	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.453E-09	0.0003
U-238	3.331E-08	0.0066	1.226E-09	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.419E-09	0.0003
Total	4.894E-06	0.9746	2.820E-08	0.0056	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.922E-08	0.0198

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

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.163E-07	0.0829
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.151E-08	0.0122
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.655E-08	0.0152
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.208E-06	0.8379
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.047E-09	0.0012
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.346E-09	0.0007
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.143E-07	0.0427
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.596E-08	0.0072
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.022E-06	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Maintenance Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground risk	Ground fract.	Inhalation risk	Inhalation fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	Soil risk	Soil fract.
Ac-227	2.806E-07	0.0559	7.014E-09	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.879E-09	0.0010
Pa-231	1.719E-07	0.0342	7.960E-09	0.0016	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.422E-09	0.0011
Pb-210	1.618E-09	0.0003	1.956E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.965E-08	0.0099
Ra-226	4.173E-06	0.8309	3.442E-09	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.237E-08	0.0064
Th-230	2.302E-08	0.0046	3.135E-09	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.615E-09	0.0005
U-234	1.019E-10	0.0000	1.824E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.421E-09	0.0003
U-235	2.112E-07	0.0421	1.642E-09	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.454E-09	0.0003
U-238	3.331E-08	0.0066	1.226E-09	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.419E-09	0.0003
Total	4.894E-06	0.9746	2.820E-08	0.0056	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.922E-08	0.0198

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

Water Dependent Pathways

Radio-Nuclide	Water risk	Water fract.	Fish risk	Fish fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	All pathways risk	All pathways fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.925E-07	0.0582
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.853E-07	0.0369
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.322E-08	0.0106
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.208E-06	0.8380
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.877E-08	0.0057
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.347E-09	0.0007
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.143E-07	0.0427
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.596E-08	0.0072
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.022E-06	1.0000

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

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

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	3.447E-03	0.000E+00	0.000E+00	0.000E+00	7.816E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.816E-01
Pa-231	3.595E-03	0.000E+00	0.000E+00	0.000E+00	8.153E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.153E-01
Pb-210	3.698E-03	0.000E+00	0.000E+00	0.000E+00	8.386E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.386E-01
Ra-226	3.701E-03	0.000E+00	0.000E+00	0.000E+00	8.391E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.391E-01
Th-230	3.700E-03	0.000E+00	0.000E+00	0.000E+00	8.389E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.389E-01
U-234	3.595E-03	0.000E+00	0.000E+00	0.000E+00	8.153E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.153E-01
U-235	3.595E-03	0.000E+00	0.000E+00	0.000E+00	8.153E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.153E-01
U-238	3.515E-03	0.000E+00	0.000E+00	0.000E+00	7.971E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.971E-01

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	3.767E-07	0.0755	9.406E-09	0.0019	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.543E-09	0.0013
Pa-231	5.163E-08	0.0104	4.856E-09	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.266E-09	0.0007
Pb-210	2.328E-09	0.0005	2.810E-09	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.134E-08	0.0143
Ra-226	4.194E-06	0.8408	2.601E-09	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.074E-08	0.0022
Th-230	4.535E-10	0.0001	3.116E-09	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.473E-09	0.0005
U-234	9.761E-11	0.0000	1.771E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.380E-09	0.0003
U-235	2.052E-07	0.0411	1.593E-09	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.411E-09	0.0003
U-238	3.164E-08	0.0063	1.164E-09	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.347E-09	0.0003
Total	4.862E-06	0.9748	2.732E-08	0.0055	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.850E-08	0.0197

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Maintenance Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.926E-07	0.0787
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.975E-08	0.0120
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.648E-08	0.0153
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.207E-06	0.8435
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.043E-09	0.0012
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.249E-09	0.0007
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.082E-07	0.0417
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.415E-08	0.0068
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.988E-06	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Maintenance Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.529E-07	0.0507	6.321E-09	0.0013	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.397E-09	0.0009
Pa-231	1.753E-07	0.0352	7.939E-09	0.0016	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.411E-09	0.0011
Pb-210	1.568E-09	0.0003	1.894E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.807E-08	0.0096
Ra-226	4.170E-06	0.8361	3.499E-09	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.386E-08	0.0068
Th-230	2.482E-08	0.0050	3.135E-09	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.628E-09	0.0005
U-234	9.925E-11	0.0000	1.772E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.380E-09	0.0003
U-235	2.052E-07	0.0411	1.595E-09	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.412E-09	0.0003
U-238	3.164E-08	0.0063	1.164E-09	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.347E-09	0.0003
Total	4.862E-06	0.9748	2.732E-08	0.0055	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.850E-08	0.0197

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.637E-07	0.0529
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.887E-07	0.0378
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.153E-08	0.0103
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.208E-06	0.8436
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.058E-08	0.0061
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.251E-09	0.0007
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.082E-07	0.0417
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.415E-08	0.0068
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.988E-06	1.0000

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

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

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	3.000E-03	0.000E+00	0.000E+00	0.000E+00	6.802E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.802E-01
Pa-231	3.391E-03	0.000E+00	0.000E+00	0.000E+00	7.689E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.689E-01
Pb-210	3.690E-03	0.000E+00	0.000E+00	0.000E+00	8.368E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.368E-01
Ra-226	3.697E-03	0.000E+00	0.000E+00	0.000E+00	8.384E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.384E-01
Th-230	3.694E-03	0.000E+00	0.000E+00	0.000E+00	8.377E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.377E-01
U-234	3.391E-03	0.000E+00	0.000E+00	0.000E+00	7.689E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.689E-01
U-235	3.391E-03	0.000E+00	0.000E+00	0.000E+00	7.689E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.689E-01
U-238	3.169E-03	0.000E+00	0.000E+00	0.000E+00	7.186E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.186E-01

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	3.365E-07	0.0683	8.396E-09	0.0017	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.840E-09	0.0012
Pa-231	4.872E-08	0.0099	4.579E-09	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.080E-09	0.0006
Pb-210	2.326E-09	0.0005	2.806E-09	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.122E-08	0.0145
Ra-226	4.193E-06	0.8512	2.599E-09	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.073E-08	0.0022
Th-230	4.532E-10	0.0001	3.112E-09	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.470E-09	0.0005
U-234	9.213E-11	0.0000	1.671E-09	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.301E-09	0.0003
U-235	1.937E-07	0.0393	1.502E-09	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.331E-09	0.0003
U-238	2.854E-08	0.0058	1.049E-09	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.215E-09	0.0002
Total	4.803E-06	0.9750	2.571E-08	0.0052	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.719E-08	0.0197

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Maintenance Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.507E-07	0.0712
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.638E-08	0.0114
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.635E-08	0.0155
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.206E-06	0.8539
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.034E-09	0.0012
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.064E-09	0.0006
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.965E-07	0.0399
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.081E-08	0.0063
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.926E-06	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Maintenance Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.056E-07	0.0417	5.133E-09	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.571E-09	0.0007
Pa-231	1.796E-07	0.0365	7.840E-09	0.0016	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.348E-09	0.0011
Pb-210	1.471E-09	0.0003	1.776E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.508E-08	0.0092
Ra-226	4.165E-06	0.8457	3.607E-09	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.669E-08	0.0074
Th-230	2.840E-08	0.0058	3.133E-09	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.655E-09	0.0005
U-234	9.414E-11	0.0000	1.671E-09	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.302E-09	0.0003
U-235	1.937E-07	0.0393	1.505E-09	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.332E-09	0.0003
U-238	2.854E-08	0.0058	1.049E-09	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.215E-09	0.0002
Total	4.803E-06	0.9750	2.571E-08	0.0052	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.719E-08	0.0197

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.143E-07	0.0435
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.928E-07	0.0391
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.832E-08	0.0098
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.206E-06	0.8538
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.419E-08	0.0069
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.067E-09	0.0006
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.965E-07	0.0399
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.081E-08	0.0063
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.926E-06	1.0000

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

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

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*	Total
Ac-227	1.928E-03	0.000E+00	0.000E+00	0.000E+00	4.371E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.371E-01	
Pa-231	2.762E-03	0.000E+00	0.000E+00	0.000E+00	6.263E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.263E-01	
Pb-210	3.665E-03	0.000E+00	0.000E+00	0.000E+00	8.311E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.311E-01	
Ra-226	3.686E-03	0.000E+00	0.000E+00	0.000E+00	8.358E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.358E-01	
Th-230	3.675E-03	0.000E+00	0.000E+00	0.000E+00	8.334E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.334E-01	
U-234	2.762E-03	0.000E+00	0.000E+00	0.000E+00	6.263E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.263E-01	
U-235	2.762E-03	0.000E+00	0.000E+00	0.000E+00	6.263E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.263E-01	
U-238	2.205E-03	0.000E+00	0.000E+00	0.000E+00	4.999E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.999E-01	

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.355E-07	0.0495	5.861E-09	0.0012	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.077E-09	0.0009
Pa-231	3.978E-08	0.0084	3.730E-09	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.509E-09	0.0005
Pb-210	2.319E-09	0.0005	2.790E-09	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.082E-08	0.0149
Ra-226	4.188E-06	0.8800	2.591E-09	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.070E-08	0.0022
Th-230	4.521E-10	0.0001	3.096E-09	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.457E-09	0.0005
U-234	7.525E-11	0.0000	1.361E-09	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.060E-09	0.0002
U-235	1.581E-07	0.0332	1.224E-09	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.084E-09	0.0002
U-238	1.990E-08	0.0042	7.300E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.449E-10	0.0002
Total	4.644E-06	0.9759	2.138E-08	0.0045	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.354E-08	0.0197

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Maintenance Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.455E-07	0.0516
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.602E-08	0.0097
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.592E-08	0.0160
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.201E-06	0.8828
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.005E-09	0.0013
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.496E-09	0.0005
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.605E-07	0.0337
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.148E-08	0.0045
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.759E-06	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Maintenance Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	9.949E-08	0.0209	2.478E-09	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.724E-09	0.0004
Pa-231	1.757E-07	0.0369	7.111E-09	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.860E-09	0.0010
Pb-210	1.178E-09	0.0002	1.418E-09	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.599E-08	0.0076
Ra-226	4.149E-06	0.8717	3.930E-09	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.522E-08	0.0095
Th-230	4.090E-08	0.0086	3.128E-09	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.765E-09	0.0006
U-234	7.888E-11	0.0000	1.361E-09	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.060E-09	0.0002
U-235	1.582E-07	0.0332	1.227E-09	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.086E-09	0.0002
U-238	1.990E-08	0.0042	7.301E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.450E-10	0.0002
Total	4.644E-06	0.9759	2.138E-08	0.0045	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.354E-08	0.0197

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.037E-07	0.0218
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.877E-07	0.0394
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.858E-08	0.0081
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.198E-06	0.8821
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.680E-08	0.0098
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.500E-09	0.0005
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.605E-07	0.0337
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.148E-08	0.0045
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.759E-06	1.0000

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

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 3.000E+01 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	7.486E-04	0.000E+00	0.000E+00	0.000E+00	1.698E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.698E-01
Pa-231	1.537E-03	0.000E+00	0.000E+00	0.000E+00	3.486E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.486E-01
Pb-210	3.607E-03	0.000E+00	0.000E+00	0.000E+00	8.180E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.180E-01
Ra-226	3.653E-03	0.000E+00	0.000E+00	0.000E+00	8.284E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.284E-01
Th-230	3.622E-03	0.000E+00	0.000E+00	0.000E+00	8.214E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.214E-01
U-234	1.537E-03	0.000E+00	0.000E+00	0.000E+00	3.486E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.486E-01
U-235	1.537E-03	0.000E+00	0.000E+00	0.000E+00	3.486E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.486E-01
U-238	7.818E-04	0.000E+00	0.000E+00	0.000E+00	1.773E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.773E-01

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

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 3.000E+01 years

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

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

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.072E-07	0.0238	2.648E-09	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.842E-09	0.0004
Pa-231	2.230E-08	0.0049	2.076E-09	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.396E-09	0.0003
Pb-210	2.305E-09	0.0005	2.751E-09	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.984E-08	0.0155
Ra-226	4.175E-06	0.9267	2.568E-09	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.060E-08	0.0024
Th-230	4.491E-10	0.0001	3.051E-09	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.421E-09	0.0005
U-234	4.222E-11	0.0000	7.573E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.899E-10	0.0001
U-235	8.867E-08	0.0197	6.811E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.032E-10	0.0001
U-238	7.105E-09	0.0016	2.589E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.996E-10	0.0001
Total	4.403E-06	0.9773	1.479E-08	0.0033	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.760E-08	0.0194

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Maintenance Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.117E-07	0.0248
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.577E-08	0.0057
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.490E-08	0.0166
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.188E-06	0.9296
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.921E-09	0.0013
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.389E-09	0.0003
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.995E-08	0.0200
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.663E-09	0.0017
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.506E-06	1.0000

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

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+01 years

Radionuclides

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

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

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Maintenance Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.251E-08	0.0028	3.094E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.152E-10	0.0000
Pa-231	1.169E-07	0.0259	4.411E-09	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.021E-09	0.0007
Pb-210	6.236E-10	0.0001	7.448E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.891E-08	0.0042
Ra-226	4.101E-06	0.9102	4.505E-09	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.077E-08	0.0135
Th-230	7.613E-08	0.0169	3.119E-09	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.189E-09	0.0007
U-234	5.248E-11	0.0000	7.579E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.905E-10	0.0001
U-235	8.875E-08	0.0197	6.844E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.054E-10	0.0001
U-238	7.105E-09	0.0016	2.589E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.997E-10	0.0001
Total	4.403E-06	0.9773	1.479E-08	0.0033	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.760E-08	0.0194

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

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.303E-08	0.0029
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.243E-07	0.0276
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.028E-08	0.0045
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.167E-06	0.9247
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.243E-08	0.0183
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.401E-09	0.0003
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.004E-08	0.0200
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.664E-09	0.0017
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.506E-06	1.0000

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

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

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	8.424E-05	0.000E+00	0.000E+00	0.000E+00	1.910E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.910E-02
Pa-231	1.976E-04	0.000E+00	0.000E+00	0.000E+00	4.480E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.480E-02
Pb-210	3.470E-03	0.000E+00	0.000E+00	0.000E+00	7.868E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.868E-01
Ra-226	3.538E-03	0.000E+00	0.000E+00	0.000E+00	8.024E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.024E-01
Th-230	3.439E-03	0.000E+00	0.000E+00	0.000E+00	7.799E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.799E-01
U-234	1.975E-04	0.000E+00	0.000E+00	0.000E+00	4.479E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.479E-02
U-235	1.976E-04	0.000E+00	0.000E+00	0.000E+00	4.480E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.480E-02
U-238	2.075E-05	0.000E+00	0.000E+00	0.000E+00	4.706E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.706E-03

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.318E-08	0.0031	3.176E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.209E-10	0.0001
Pa-231	2.937E-09	0.0007	2.668E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.794E-10	0.0000
Pb-210	2.284E-09	0.0005	2.651E-09	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.731E-08	0.0158
Ra-226	4.128E-06	0.9718	2.486E-09	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.026E-08	0.0024
Th-230	4.386E-10	0.0001	2.896E-09	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.299E-09	0.0005
U-234	5.582E-12	0.0000	9.731E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.580E-11	0.0000
U-235	1.170E-08	0.0028	8.753E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.752E-11	0.0000
U-238	1.931E-10	0.0000	6.871E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.952E-12	0.0000
Total	4.158E-06	0.9790	8.810E-09	0.0021	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.043E-08	0.0189

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Maintenance Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.372E-08	0.0032
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.383E-09	0.0008
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.224E-08	0.0170
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.140E-06	0.9748
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.633E-09	0.0013
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.787E-10	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.186E-08	0.0028
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.079E-10	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.248E-06	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Maintenance Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	8.815E-12	0.0000	2.127E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.480E-13	0.0000
Pa-231	1.607E-08	0.0038	5.829E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.993E-10	0.0001
Pb-210	6.738E-11	0.0000	7.827E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.987E-09	0.0005
Ra-226	3.936E-06	0.9268	4.852E-09	0.0011	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.280E-08	0.0171
Th-230	1.937E-07	0.0456	3.103E-09	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.087E-09	0.0012
U-234	4.851E-11	0.0000	9.822E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.706E-11	0.0000
U-235	1.173E-08	0.0028	8.882E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.839E-11	0.0000
U-238	1.931E-10	0.0000	6.882E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.961E-12	0.0000
Total	4.158E-06	0.9790	8.810E-09	0.0021	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.043E-08	0.0189

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

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.175E-12	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.705E-08	0.0040
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.132E-09	0.0005
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.014E-06	0.9450
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.019E-07	0.0475
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.238E-10	0.0001
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.190E-08	0.0028
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.079E-10	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.248E-06	1.0000

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

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

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	2.385E-07	0.000E+00	0.000E+00	0.000E+00	5.407E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.407E-05
Pa-231	5.597E-07	0.000E+00	0.000E+00	0.000E+00	1.269E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.269E-04
Pb-210	3.141E-03	0.000E+00	0.000E+00	0.000E+00	7.122E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.122E-01
Ra-226	3.204E-03	0.000E+00	0.000E+00	0.000E+00	7.265E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.265E-01
Th-230	2.951E-03	0.000E+00	0.000E+00	0.000E+00	6.691E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.691E-01
U-234	5.593E-07	0.000E+00	0.000E+00	0.000E+00	1.268E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.268E-04
U-235	5.597E-07	0.000E+00	0.000E+00	0.000E+00	1.269E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.269E-04
U-238	6.486E-10	0.000E+00	0.000E+00	0.000E+00	1.471E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.471E-07

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	4.013E-11	0.0000	8.990E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.254E-13	0.0000
Pa-231	8.948E-12	0.0000	7.555E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.081E-13	0.0000
Pb-210	2.248E-09	0.0006	2.399E-09	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.090E-08	0.0150
Ra-226	3.969E-06	0.9797	2.249E-09	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.287E-09	0.0023
Th-230	4.094E-10	0.0001	2.483E-09	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.971E-09	0.0005
U-234	1.721E-14	0.0000	2.754E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.145E-13	0.0000
U-235	3.582E-11	0.0000	2.479E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.195E-13	0.0000
U-238	6.470E-15	0.0000	2.147E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.484E-16	0.0000
Total	3.972E-06	0.9804	7.134E-09	0.0018	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.216E-08	0.0178

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Maintenance Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.166E-11	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.021E-11	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.555E-08	0.0162
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.981E-06	0.9826
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.864E-09	0.0012
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.072E-13	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.628E-11	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.933E-15	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.051E-06	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Maintenance Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	8.678E-21	0.0000	1.946E-22	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.354E-22	0.0000
Pa-231	4.877E-11	0.0000	1.644E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.126E-12	0.0000
Pb-210	1.167E-13	0.0000	1.247E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.165E-12	0.0000
Ra-226	3.489E-06	0.8611	4.110E-09	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.234E-08	0.0154
Th-230	4.831E-07	0.1192	3.021E-09	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.817E-09	0.0024
U-234	1.355E-10	0.0000	1.207E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.009E-12	0.0000
U-235	3.613E-11	0.0000	2.585E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.268E-13	0.0000
U-238	1.347E-14	0.0000	3.004E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.211E-16	0.0000
Total	3.972E-06	0.9804	7.134E-09	0.0018	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.216E-08	0.0178

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.008E-21	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.154E-11	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.406E-12	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.555E-06	0.8775
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.959E-07	0.1224
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.397E-10	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.661E-11	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.419E-14	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.051E-06	1.0000

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

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

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	2.668E-16	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.049E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.049E-14
Pa-231	6.262E-16	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.420E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.420E-13
Pb-210	1.995E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.524E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.524E-01
Ra-226	2.031E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.606E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.606E-01
Th-230	1.595E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.617E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.617E-01
U-234	6.245E-16	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.416E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.416E-13
U-235	6.262E-16	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.420E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.420E-13
U-238	1.023E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.321E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.321E-23

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	5.990E-20	0.0000	1.003E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.980E-22	0.0000
Pa-231	1.333E-20	0.0000	8.432E-22	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.671E-22	0.0000
Pb-210	2.036E-09	0.0006	1.519E-09	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.856E-08	0.0119
Ra-226	3.180E-06	0.9839	1.421E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.868E-09	0.0018
Th-230	3.142E-10	0.0001	1.339E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.063E-09	0.0003
U-234	2.750E-23	0.0000	3.068E-22	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.390E-22	0.0000
U-235	5.470E-20	0.0000	2.767E-22	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.450E-22	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	3.182E-06	0.9846	4.279E-09	0.0013	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.549E-08	0.0141

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Maintenance Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.160E-20	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.474E-20	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.211E-08	0.0130
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.187E-06	0.9861
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.716E-09	0.0008
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.733E-22	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.522E-20	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.232E-06	1.0000

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

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

Radionuclides

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pa-231	7.170E-20	0.0000	1.808E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.239E-21	0.0000
Pb-210	2.489E-23	0.0000	1.858E-23	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.716E-22	0.0000
Ra-226	2.162E-06	0.6691	2.010E-09	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.048E-08	0.0094
Th-230	1.019E-06	0.3154	2.269E-09	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.500E-08	0.0046
U-234	3.108E-10	0.0001	7.053E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.581E-12	0.0000
U-235	5.623E-20	0.0000	3.155E-22	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.716E-22	0.0000
U-238	1.692E-14	0.0000	3.883E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.496E-16	0.0000
Total	3.182E-06	0.9846	4.279E-09	0.0013	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.549E-08	0.0141

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.474E-20	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.151E-22	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.195E-06	0.6792
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.037E-06	0.3207
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.161E-10	0.0001
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.682E-20	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.721E-14	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.232E-06	1.0000

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

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Maintenance Worker
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Part I: Mixture Sums and Single Radionuclide Guidelines

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Maintenance Worker
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Dose Conversion Factor (and Related) Parameter Summary
Dose Library: ICRP 72 (Adult)

Menu	Parameter	Current Value#	Base Case*	Parameter Name
A-1	DCF's for external ground radiation, (mrem/yr)/(pCi/g)			
A-1	Ac-227 (Source: ICRP 60)	4.485E-04	4.485E-04	DCF1(1)
A-1	At-218 (Source: ICRP 60)	4.878E-03	4.878E-03	DCF1(2)
A-1	Bi-210 (Source: ICRP 60)	5.476E-03	5.476E-03	DCF1(3)
A-1	Bi-211 (Source: ICRP 60)	2.373E-01	2.373E-01	DCF1(4)
A-1	Bi-214 (Source: ICRP 60)	9.325E+00	9.325E+00	DCF1(5)
A-1	Fr-223 (Source: ICRP 60)	1.813E-01	1.813E-01	DCF1(6)
A-1	Pa-231 (Source: ICRP 60)	1.762E-01	1.762E-01	DCF1(7)
A-1	Pa-234 (Source: ICRP 60)	1.088E+01	1.088E+01	DCF1(8)
A-1	Pa-234m (Source: ICRP 60)	9.867E-02	9.867E-02	DCF1(9)
A-1	Pb-210 (Source: ICRP 60)	1.981E-03	1.981E-03	DCF1(10)
A-1	Pb-211 (Source: ICRP 60)	2.915E-01	2.915E-01	DCF1(11)
A-1	Pb-214 (Source: ICRP 60)	1.243E+00	1.243E+00	DCF1(12)
A-1	Po-210 (Source: ICRP 60)	4.934E-05	4.934E-05	DCF1(13)
A-1	Po-211 (Source: ICRP 60)	4.485E-02	4.485E-02	DCF1(14)
A-1	Po-214 (Source: ICRP 60)	4.840E-04	4.840E-04	DCF1(15)
A-1	Po-215 (Source: ICRP 60)	9.456E-04	9.456E-04	DCF1(16)
A-1	Po-218 (Source: ICRP 60)	5.326E-05	5.326E-05	DCF1(17)
A-1	Ra-223 (Source: ICRP 60)	5.532E-01	5.532E-01	DCF1(18)
A-1	Ra-226 (Source: ICRP 60)	2.915E-02	2.915E-02	DCF1(19)
A-1	Rn-219 (Source: ICRP 60)	2.859E-01	2.859E-01	DCF1(20)
A-1	Rn-222 (Source: ICRP 60)	2.186E-03	2.186E-03	DCF1(21)
A-1	Th-227 (Source: ICRP 60)	4.803E-01	4.803E-01	DCF1(22)
A-1	Th-230 (Source: ICRP 60)	1.071E-03	1.071E-03	DCF1(23)
A-1	Th-231 (Source: ICRP 60)	3.214E-02	3.214E-02	DCF1(24)
A-1	Th-234 (Source: ICRP 60)	2.130E-02	2.130E-02	DCF1(25)
A-1	Tl-207 (Source: ICRP 60)	2.299E-02	2.299E-02	DCF1(26)
A-1	Tl-210 (Source: ICRP 60)	1.661E+01	1.661E+01	DCF1(27)
A-1	U-234 (Source: ICRP 60)	3.439E-04	3.439E-04	DCF1(28)
A-1	U-235 (Source: ICRP 60)	6.597E-01	6.597E-01	DCF1(29)
A-1	U-238 (Source: ICRP 60)	7.961E-05	7.961E-05	DCF1(30)
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	2.104E+00	2.035E+00	DCF2(1)
B-1	Pa-231	5.180E-01	5.180E-01	DCF2(2)
B-1	Pb-210+D	3.697E-02	2.072E-02	DCF2(3)
B-1	Ra-226+D	3.526E-02	3.515E-02	DCF2(4)
B-1	Th-230	3.700E-01	3.700E-01	DCF2(5)
B-1	U-234	3.478E-02	3.478E-02	DCF2(6)
B-1	U-235+D	3.145E-02	3.145E-02	DCF2(7)
B-1	U-238	2.960E-02	2.960E-02	DCF2(8)
B-1	U-238+D	2.963E-02	2.960E-02	DCF2(9)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	4.473E-03	4.070E-03	DCF3(1)
D-1	Pa-231	2.627E-03	2.627E-03	DCF3(2)
D-1	Pb-210+D	6.998E-03	2.553E-03	DCF3(3)
D-1	Ra-226+D	1.037E-03	1.036E-03	DCF3(4)
D-1	Th-230	7.770E-04	7.770E-04	DCF3(5)
D-1	U-234	1.813E-04	1.813E-04	DCF3(6)

Dose Conversion Factor (and Related) Parameter Summary (continued)
Dose Library: ICRP 72 (Adult)

Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-1	U-235+D	1.752E-04	1.739E-04	DCF3(7)
D-1	U-238	1.665E-04	1.665E-04	DCF3(8)
D-1	U-238+D	1.791E-04	1.665E-04	DCF3(9)
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	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(2,1)
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(2,2)
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(2,3)
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(3,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(3,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(3,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(4,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(4,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(4,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(5,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(5,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(5,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(6,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(6,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(6,3)
D-34				
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(7,1)
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(7,2)
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(7,3)
D-34				
D-34	U-238 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(8,1)
D-34	U-238 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(8,2)
D-34	U-238 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(8,3)
D-34				
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(9,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(9,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(9,3)
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	Pa-231 , fish	1.000E+01	1.000E+01	BIOFAC(2,1)
D-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(2,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(3,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(3,2)

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Dose Conversion Factor (and Related) Parameter Summary (continued)

Dose Library: ICRP 72 (Adult)

Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(4,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(4,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(5,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(5,2)
D-5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(6,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(6,2)
D-5				
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIOFAC(7,1)
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(7,2)
D-5				
D-5	U-238 , fish	1.000E+01	1.000E+01	BIOFAC(8,1)
D-5	U-238 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(8,2)
D-5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(9,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(9,2)

#For DCF1(xxx) only, factors are for infinite depth & area. See ETFG table in Ground Pathway of Detailed Report.

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

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Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.620E+04	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	1.370E+00	2.000E+00	---	THICK0
R011	Fraction of contamination that is submerged	0.000E+00	0.000E+00	---	SUBMFRACT
R011	Length parallel to aquifer flow (m)	not used	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Ac-227	1.000E+00	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g): Pa-231	1.000E+00	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Pb-210	1.000E+00	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): Ra-226	1.000E+00	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Th-230	1.000E+00	0.000E+00	---	S1(5)
R012	Initial principal radionuclide (pCi/g): U-234	1.000E+00	0.000E+00	---	S1(6)
R012	Initial principal radionuclide (pCi/g): U-235	1.000E+00	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): U-238	1.000E+00	0.000E+00	---	S1(8)
R012	Concentration in groundwater (pCi/L): Ac-227	not used	0.000E+00	---	W1(1)
R012	Concentration in groundwater (pCi/L): Pa-231	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Pb-210	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	W1(4)
R012	Concentration in groundwater (pCi/L): Th-230	not used	0.000E+00	---	W1(5)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(6)
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	---	W1(7)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(8)
R013	Cover depth (m)	1.500E-01	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	1.700E+00	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	6.000E-05	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.700E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	6.000E-05	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.200E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	3.600E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	6.840E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	1.040E+01	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	4.400E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	9.000E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	4.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	not used	1.000E+06	---	WAREA

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R013	Accuracy for water/soil computations	not used	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	not used	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	not used	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	not used	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	not used	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	not used	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	not used	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	not used	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	not used	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	not used	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	not used	2.500E+02	---	UW
R015	Number of unsaturated zone strata	not used	1	---	NS
R015	Unsat. zone 1, thickness (m)	not used	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	not used	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	not used	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	not used	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	not used	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	not used	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	not used	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Ac-227				
R016	Contaminated zone (cm**3/g)	2.400E+03	2.000E+01	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	not used	2.000E+01	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	not used	2.000E+01	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	6.619E-05	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for Pa-231				
R016	Contaminated zone (cm**3/g)	2.700E+03	5.000E+01	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.883E-05	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Pb-210				
R016	Contaminated zone (cm**3/g)	2.100E+03	1.000E+02	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	not used	1.000E+02	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.564E-05	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	3.800E+04	7.000E+01	---	DCNUCC(4)
R016	Unsaturated zone 1 (cm**3/g)	not used	7.000E+01	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.181E-06	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Th-230				
R016	Contaminated zone (cm**3/g)	4.500E+03	6.000E+04	---	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	not used	6.000E+04	---	DCNUCU(5,1)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.530E-05	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	2.800E+01	5.000E+01	---	DCNUCC(6)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.631E-03	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R016	Distribution coefficients for U-235				
R016	Contaminated zone (cm**3/g)	2.800E+01	5.000E+01	---	DCNUCC(7)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(7,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.631E-03	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	2.800E+01	5.000E+01	---	DCNUCC(8)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(8,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.631E-03	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R017	Inhalation rate (m**3/yr)	2.000E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	2.500E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	2.300E-02	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)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	not used	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	not used	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	not used	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	not used	-1	---	FPLANT
R018	Contamination fraction of meat	not used	-1	---	FMEAT
R018	Contamination fraction of milk	not used	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	not used	5.000E-01	---	LSI
R019	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	not used	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	not used	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	not used	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	not used	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	not used	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	not used	8.000E-02	---	TE(3)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	not used	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	not used	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	not used	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
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

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	257	---	---	KYMAX

Summary of Pathway Selections

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

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Maintenance Worker

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Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	16200.00 square meters	Ac-227	1.000E+00
Thickness:	1.37 meters	Pa-231	1.000E+00
Cover Depth:	0.15 meters	Pb-210	1.000E+00
		Ra-226	1.000E+00
		Th-230	1.000E+00
		U-234	1.000E+00
		U-235	1.000E+00
		U-238	1.000E+00

Total Dose TDOSE(t), mrem/yr

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

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

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	3.217E-02	3.220E-02	3.227E-02	3.250E-02	3.317E-02	3.561E-02	4.338E-02	8.084E-02
M(t):	1.287E-03	1.288E-03	1.291E-03	1.300E-03	1.327E-03	1.425E-03	1.735E-03	3.234E-03

Maximum TDOSE(t): 8.084E-02 mrem/yr at t = 1.000E+03 years

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Maintenance Worker
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Ac-227	2.014E-03	0.0626	1.525E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.352E-07	0.0000
Pa-231	2.178E-04	0.0068	4.162E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.568E-07	0.0000
Pb-210	2.181E-06	0.0001	2.682E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.151E-06	0.0000
Ra-226	2.923E-02	0.9088	2.666E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.981E-07	0.0000
Th-230	6.515E-06	0.0002	2.740E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.305E-07	0.0000
U-234	3.909E-08	0.0000	2.566E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.033E-08	0.0000
U-235	4.260E-04	0.0132	2.321E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.931E-08	0.0000
U-238	2.620E-04	0.0081	2.186E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.996E-08	0.0000
Total	3.216E-02	0.9998	2.339E-06	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.761E-06	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 mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.017E-03	0.0627
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.187E-04	0.0068
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.359E-06	0.0001
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.923E-02	0.9088
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.919E-06	0.0002
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.508E-08	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.261E-04	0.0132
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.621E-04	0.0081
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.217E-02	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Maintenance Worker
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	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.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Ac-227	1.953E-03	0.0607	4.447E-06	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.144E-06	0.0001
Pa-231	2.813E-04	0.0087	1.376E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.432E-06	0.0000
Pb-210	2.117E-06	0.0001	7.825E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.358E-06	0.0001
Ra-226	2.924E-02	0.9082	8.213E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.881E-07	0.0000
Th-230	1.919E-05	0.0006	8.219E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.917E-07	0.0000
U-234	3.907E-08	0.0000	7.659E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.053E-08	0.0000
U-235	4.243E-04	0.0132	6.929E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.750E-08	0.0000
U-238	2.608E-04	0.0081	6.524E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.942E-08	0.0000
Total	3.219E-02	0.9995	7.016E-06	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.281E-06	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-Nuclide	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.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.960E-03	0.0609
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.841E-04	0.0088
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.553E-06	0.0002
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.925E-02	0.9082
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.041E-05	0.0006
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.062E-07	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.244E-04	0.0132
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.609E-04	0.0081
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.220E-02	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Maintenance Worker
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 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.
Ac-227	1.837E-03	0.0569	9.745E-06	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.698E-06	0.0001
Pa-231	4.027E-04	0.0125	3.840E-06	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.644E-06	0.0001
Pb-210	1.995E-06	0.0001	1.717E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.370E-06	0.0002
Ra-226	2.927E-02	0.9070	2.023E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.069E-06	0.0001
Th-230	4.459E-05	0.0014	1.918E-06	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.156E-07	0.0000
U-234	3.935E-08	0.0000	1.768E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.089E-07	0.0000
U-235	4.207E-04	0.0130	1.601E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.021E-07	0.0000
U-238	2.583E-04	0.0080	1.505E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.063E-07	0.0000
Total	3.223E-02	0.9989	1.636E-05	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.931E-05	0.0006

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.851E-03	0.0574
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.101E-04	0.0127
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.536E-06	0.0003
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.927E-02	0.9071
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.742E-05	0.0015
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.251E-07	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.211E-04	0.0130
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.587E-04	0.0080
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.227E-02	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Maintenance Worker
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 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.
Ac-227	1.481E-03	0.0456	2.340E-05	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.128E-05	0.0003
Pa-231	7.755E-04	0.0239	1.734E-05	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.373E-05	0.0004
Pb-210	1.619E-06	0.0000	4.144E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.779E-05	0.0005
Ra-226	2.934E-02	0.9028	7.054E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.049E-05	0.0003
Th-230	1.339E-04	0.0041	5.753E-06	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.771E-06	0.0001
U-234	4.391E-08	0.0000	5.102E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.028E-07	0.0000
U-235	4.085E-04	0.0126	4.638E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.846E-07	0.0000
U-238	2.499E-04	0.0077	4.342E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.952E-07	0.0000
Total	3.239E-02	0.9967	4.902E-05	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.785E-05	0.0018

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.516E-03	0.0466
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.066E-04	0.0248
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.982E-05	0.0006
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.935E-02	0.9032
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.425E-04	0.0044
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.157E-06	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.096E-04	0.0126
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.510E-04	0.0077
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.250E-02	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Maintenance Worker
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	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.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Ac-227	8.010E-04	0.0241	3.591E-05	0.0011	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.731E-05	0.0005
Pa-231	1.506E-03	0.0454	8.224E-05	0.0025	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.524E-05	0.0017
Pb-210	8.921E-07	0.0000	6.456E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.771E-05	0.0008
Ra-226	2.956E-02	0.8911	2.585E-06	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.400E-05	0.0016
Th-230	3.931E-04	0.0119	1.672E-05	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.420E-06	0.0003
U-234	8.619E-08	0.0000	1.327E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.566E-06	0.0000
U-235	3.759E-04	0.0113	1.231E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.537E-06	0.0000
U-238	2.275E-04	0.0069	1.127E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.545E-06	0.0000
Total	3.286E-02	0.9907	1.418E-04	0.0043	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.673E-04	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 = 3.000E+01 years

Water Dependent Pathways

Radio-Nuclide	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.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.542E-04	0.0258
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.643E-03	0.0495
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.925E-05	0.0009
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.961E-02	0.8928
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.182E-04	0.0126
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.979E-06	0.0001
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.787E-04	0.0114
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.301E-04	0.0069
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.317E-02	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Maintenance Worker
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	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.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Ac-227	9.314E-05	0.0026	1.269E-05	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.116E-06	0.0002
Pa-231	2.396E-03	0.0673	3.745E-04	0.0105	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.316E-04	0.0065
Pb-210	1.108E-07	0.0000	2.402E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.031E-05	0.0003
Ra-226	3.033E-02	0.8515	1.011E-05	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.517E-04	0.0071
Th-230	1.347E-03	0.0378	5.521E-05	0.0016	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.458E-05	0.0010
U-234	5.399E-07	0.0000	2.976E-06	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.494E-06	0.0001
U-235	2.824E-04	0.0079	3.156E-06	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.680E-06	0.0001
U-238	1.635E-04	0.0046	2.505E-06	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.433E-06	0.0001
Total	3.461E-02	0.9717	4.614E-04	0.0130	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.450E-04	0.0153

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

Water Dependent Pathways

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.119E-04	0.0031
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.002E-03	0.0843
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.066E-05	0.0003
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.059E-02	0.8588
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.437E-03	0.0403
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.010E-06	0.0002
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.892E-04	0.0081
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.695E-04	0.0048
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.561E-02	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Maintenance Worker
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	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.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Ac-227	1.992E-07	0.0000	6.428E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.099E-08	0.0000
Pa-231	3.094E-03	0.0713	1.139E-03	0.0263	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.996E-04	0.0161
Pb-210	2.860E-10	0.0000	1.412E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.061E-08	0.0000
Ra-226	3.264E-02	0.7524	2.835E-05	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.181E-04	0.0166
Th-230	4.510E-03	0.1040	1.662E-04	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.668E-04	0.0038
U-234	3.814E-06	0.0001	3.063E-06	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.538E-06	0.0001
U-235	1.292E-04	0.0030	5.962E-06	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.351E-06	0.0001
U-238	6.375E-05	0.0015	2.430E-06	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.330E-06	0.0001
Total	4.044E-02	0.9322	1.345E-03	0.0310	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.597E-03	0.0368

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 mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.945E-07	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.932E-03	0.1137
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.231E-08	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.338E-02	0.7696
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.843E-03	0.1116
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.042E-05	0.0002
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.405E-04	0.0032
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.951E-05	0.0016
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.338E-02	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Maintenance Worker
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	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.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Ac-227	9.072E-17	0.0000	4.288E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.067E-17	0.0000
Pa-231	6.662E-03	0.0824	3.587E-03	0.0444	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.202E-03	0.0272
Pb-210	2.507E-19	0.0000	1.585E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.801E-17	0.0000
Ra-226	4.229E-02	0.5232	6.951E-05	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.761E-03	0.0218
Th-230	2.246E-02	0.2778	5.606E-04	0.0069	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.153E-03	0.0143
U-234	3.053E-05	0.0004	1.074E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.838E-06	0.0000
U-235	3.153E-05	0.0004	1.378E-05	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.568E-06	0.0001
U-238	2.385E-06	0.0000	1.579E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.164E-07	0.0000
Total	7.148E-02	0.8842	4.232E-03	0.0523	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.127E-03	0.0634

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

Water Dependent Pathways

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.543E-16	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.245E-02	0.1540
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.984E-17	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.412E-02	0.5458
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.417E-02	0.2990
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.344E-05	0.0004
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.388E-05	0.0007
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.759E-06	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.084E-02	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Maintenance Worker
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Dose/Source Ratios Summed Over All Pathways
Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g) 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-227+D	Ac-227+D	1.000E+00	2.017E-03	1.960E-03	1.851E-03	1.516E-03	8.542E-04	1.119E-04	2.945E-07	1.543E-16
Pa-231	Pa-231	1.000E+00	1.864E-04	1.883E-04	1.920E-04	2.050E-04	2.421E-04	3.721E-04	7.439E-04	2.095E-03
Pa-231	Ac-227+D	1.000E+00	3.229E-05	9.580E-05	2.181E-04	6.016E-04	1.401E-03	2.630E-03	4.189E-03	1.036E-02
Pa-231	äDSR(j)		2.187E-04	2.841E-04	4.101E-04	8.066E-04	1.643E-03	3.002E-03	4.932E-03	1.245E-02
Pb-210+D	Pb-210+D	1.000E+00	3.359E-06	5.553E-06	9.536E-06	1.982E-05	2.925E-05	1.066E-05	6.231E-08	6.984E-17
Ra-226+D	Ra-226+D	1.000E+00	2.923E-02	2.925E-02	2.927E-02	2.935E-02	2.957E-02	3.036E-02	3.274E-02	4.255E-02
Ra-226+D	Pb-210+D	1.000E+00	5.870E-08	2.710E-07	1.101E-06	7.638E-06	4.594E-05	2.257E-04	6.439E-04	1.577E-03
Ra-226+D	äDSR(j)		2.923E-02	2.925E-02	2.927E-02	2.935E-02	2.961E-02	3.059E-02	3.338E-02	4.412E-02
Th-230	Th-230	1.000E+00	5.854E-07	1.394E-06	3.012E-06	8.673E-06	2.483E-05	8.115E-05	2.402E-04	7.753E-04
Th-230	Ra-226+D	1.000E+00	6.334E-06	1.901E-05	4.441E-05	1.338E-04	3.930E-04	1.348E-03	4.524E-03	2.259E-02
Th-230	Pb-210+D	1.000E+00	8.948E-12	9.394E-11	8.603E-10	1.836E-08	3.518E-07	7.226E-06	7.890E-05	8.049E-04
Th-230	äDSR(j)		6.919E-06	2.041E-05	4.742E-05	1.425E-04	4.182E-04	1.437E-03	4.843E-03	2.417E-02
U-234	U-234	1.000E+00	9.505E-08	2.060E-07	4.243E-07	1.150E-06	2.922E-06	6.439E-06	6.226E-06	4.018E-07
U-234	Th-230	1.000E+00	3.235E-12	1.935E-11	9.458E-11	7.968E-10	6.268E-09	5.617E-08	3.147E-07	1.244E-06
U-234	Ra-226+D	1.000E+00	1.898E-11	1.327E-10	6.999E-10	6.208E-09	5.112E-08	5.132E-07	3.812E-06	3.071E-05
U-234	Pb-210+D	1.000E+00	2.075E-17	4.620E-16	9.242E-15	5.865E-13	3.313E-11	2.262E-09	6.243E-08	1.086E-06
U-234	äDSR(j)		9.508E-08	2.062E-07	4.251E-07	1.157E-06	2.979E-06	7.010E-06	1.042E-05	3.344E-05
U-235+D	U-235+D	1.000E+00	4.261E-04	4.244E-04	4.210E-04	4.095E-04	3.781E-04	2.853E-04	1.259E-04	6.637E-06
U-235+D	Pa-231	1.000E+00	1.972E-09	5.953E-09	1.408E-08	4.424E-08	1.437E-07	6.064E-07	2.301E-06	7.953E-06
U-235+D	Ac-227+D	1.000E+00	2.281E-10	1.584E-09	8.228E-09	6.920E-08	4.936E-07	3.295E-06	1.232E-05	3.929E-05
U-235+D	äDSR(j)		4.261E-04	4.244E-04	4.211E-04	4.096E-04	3.787E-04	2.892E-04	1.405E-04	5.388E-05
U-238	U-238	5.400E-05	2.683E-12	8.009E-12	1.848E-11	5.331E-11	1.384E-10	3.074E-10	2.980E-10	1.926E-11
U-238+D	U-238+D	9.999E-01	2.621E-04	2.609E-04	2.587E-04	2.510E-04	2.301E-04	1.695E-04	6.950E-05	2.745E-06
U-238+D	U-234	9.999E-01	1.611E-13	9.022E-13	4.235E-12	3.425E-11	2.526E-10	1.835E-09	5.306E-09	1.141E-09
U-238+D	Th-230	9.999E-01	3.340E-18	4.383E-17	4.737E-16	1.176E-14	2.633E-13	7.256E-12	9.818E-11	6.180E-10
U-238+D	Ra-226+D	9.999E-01	1.344E-17	2.012E-16	2.338E-15	6.111E-14	1.434E-12	4.450E-11	8.244E-10	1.257E-08
U-238+D	Pb-210+D	9.999E-01	1.200E-23	5.505E-22	2.356E-20	4.408E-18	7.292E-16	1.659E-13	1.258E-11	4.400E-10
U-238+D	äDSR(j)		2.621E-04	2.609E-04	2.587E-04	2.510E-04	2.301E-04	1.695E-04	6.951E-05	2.759E-06

The DSR includes contributions from associated (half-life ó 180 days) daughters.

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Maintenance Worker
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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
Ac-227	1.240E+04	1.275E+04	1.350E+04	1.649E+04	2.927E+04	2.233E+05	8.489E+07	*7.232E+13
Pa-231	1.143E+05	8.801E+04	6.096E+04	3.099E+04	1.522E+04	8.328E+03	5.068E+03	2.008E+03
Pb-210	7.443E+06	4.502E+06	2.622E+06	1.261E+06	8.548E+05	2.345E+06	4.012E+08	*7.634E+13
Ra-226	8.552E+02	8.548E+02	8.542E+02	8.517E+02	8.442E+02	8.173E+02	7.489E+02	5.666E+02
Th-230	3.613E+06	1.225E+06	5.272E+05	1.755E+05	5.978E+04	1.740E+04	5.162E+03	1.034E+03
U-234	2.629E+08	1.212E+08	5.882E+07	2.161E+07	8.392E+06	3.566E+06	2.400E+06	7.477E+05
U-235	5.867E+04	5.890E+04	5.937E+04	6.104E+04	6.602E+04	8.644E+04	1.779E+05	4.640E+05
U-238	9.540E+04	9.581E+04	9.664E+04	9.961E+04	1.086E+05	1.475E+05	*3.361E+05	*3.361E+05

*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 = 1.000E+03 years

Nuclide (i)	Initial (pCi/g)	tmin (years)	DSR(i,tmin) (pCi/g)	G(i,tmin) (pCi/g)	DSR(i,tmax) (pCi/g)	G(i,tmax) (pCi/g)
Ac-227	1.000E+00	0.000E+00	2.017E-03	1.240E+04	1.543E-16	*7.232E+13
Pa-231	1.000E+00	1.000E+03	1.245E-02	2.008E+03	1.245E-02	2.008E+03
Pb-210	1.000E+00	30.67 ñ 0.06	2.925E-05	8.546E+05	6.984E-17	*7.634E+13
Ra-226	1.000E+00	1.000E+03	4.412E-02	5.666E+02	4.412E-02	5.666E+02
Th-230	1.000E+00	1.000E+03	2.417E-02	1.034E+03	2.417E-02	1.034E+03
U-234	1.000E+00	1.000E+03	3.344E-05	7.477E+05	3.344E-05	7.477E+05
U-235	1.000E+00	0.000E+00	4.261E-04	5.867E+04	5.388E-05	4.640E+05
U-238	1.000E+00	0.000E+00	2.621E-04	9.540E+04	2.759E-06	*3.361E+05

*At specific activity limit

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Maintenance Worker
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Individual Nuclide Dose Summed Over All Pathways
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	DOSE(j,t), mrem/yr t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-227	Ac-227	1.000E+00	2.017E-03	1.960E-03	1.851E-03	1.516E-03	8.542E-04	1.119E-04	2.945E-07	1.543E-16
Ac-227	Pa-231	1.000E+00	3.229E-05	9.580E-05	2.181E-04	6.016E-04	1.401E-03	2.630E-03	4.189E-03	1.036E-02
Ac-227	U-235	1.000E+00	2.281E-10	1.584E-09	8.228E-09	6.920E-08	4.936E-07	3.295E-06	1.232E-05	3.929E-05
Ac-227	äDOSE(j)		2.049E-03	2.056E-03	2.070E-03	2.118E-03	2.256E-03	2.745E-03	4.201E-03	1.040E-02
Pa-231	Pa-231	1.000E+00	1.864E-04	1.883E-04	1.920E-04	2.050E-04	2.421E-04	3.721E-04	7.439E-04	2.095E-03
Pa-231	U-235	1.000E+00	1.972E-09	5.953E-09	1.408E-08	4.424E-08	1.437E-07	6.064E-07	2.301E-06	7.953E-06
Pa-231	äDOSE(j)		1.864E-04	1.883E-04	1.920E-04	2.050E-04	2.423E-04	3.727E-04	7.462E-04	2.103E-03
Pb-210	Pb-210	1.000E+00	3.359E-06	5.553E-06	9.536E-06	1.982E-05	2.925E-05	1.066E-05	6.231E-08	6.984E-17
Pb-210	Ra-226	1.000E+00	5.870E-08	2.710E-07	1.101E-06	7.638E-06	4.594E-05	2.257E-04	6.439E-04	1.577E-03
Pb-210	Th-230	1.000E+00	8.948E-12	9.394E-11	8.603E-10	1.836E-08	3.518E-07	7.226E-06	7.890E-05	8.049E-04
Pb-210	U-234	1.000E+00	2.075E-17	4.620E-16	9.242E-15	5.865E-13	3.313E-11	2.262E-09	6.243E-08	1.086E-06
Pb-210	U-238	9.999E-01	1.200E-23	5.505E-22	2.356E-20	4.408E-18	7.292E-16	1.659E-13	1.258E-11	4.400E-10
Pb-210	äDOSE(j)		3.417E-06	5.825E-06	1.064E-05	2.748E-05	7.553E-05	2.436E-04	7.230E-04	2.383E-03
Ra-226	Ra-226	1.000E+00	2.923E-02	2.925E-02	2.927E-02	2.935E-02	2.957E-02	3.036E-02	3.274E-02	4.255E-02
Ra-226	Th-230	1.000E+00	6.334E-06	1.901E-05	4.441E-05	1.338E-04	3.930E-04	1.348E-03	4.524E-03	2.259E-02
Ra-226	U-234	1.000E+00	1.898E-11	1.327E-10	6.999E-10	6.208E-09	5.112E-08	5.132E-07	3.812E-06	3.071E-05
Ra-226	U-238	9.999E-01	1.344E-17	2.012E-16	2.338E-15	6.111E-14	1.434E-12	4.450E-11	8.244E-10	1.257E-08
Ra-226	äDOSE(j)		2.924E-02	2.926E-02	2.931E-02	2.948E-02	2.996E-02	3.171E-02	3.727E-02	6.517E-02
Th-230	Th-230	1.000E+00	5.854E-07	1.394E-06	3.012E-06	8.673E-06	2.483E-05	8.115E-05	2.402E-04	7.753E-04
Th-230	U-234	1.000E+00	3.235E-12	1.935E-11	9.458E-11	7.968E-10	6.268E-09	5.617E-08	3.147E-07	1.244E-06
Th-230	U-238	9.999E-01	3.340E-18	4.383E-17	4.737E-16	1.176E-14	2.633E-13	7.256E-12	9.818E-11	6.180E-10
Th-230	äDOSE(j)		5.854E-07	1.394E-06	3.013E-06	8.674E-06	2.483E-05	8.120E-05	2.405E-04	7.766E-04
U-234	U-234	1.000E+00	9.505E-08	2.060E-07	4.243E-07	1.150E-06	2.922E-06	6.439E-06	6.226E-06	4.018E-07
U-234	U-238	9.999E-01	1.611E-13	9.022E-13	4.235E-12	3.425E-11	2.526E-10	1.835E-09	5.306E-09	1.141E-09
U-234	äDOSE(j)		9.505E-08	2.060E-07	4.243E-07	1.150E-06	2.922E-06	6.441E-06	6.231E-06	4.029E-07
U-235	U-235	1.000E+00	4.261E-04	4.244E-04	4.210E-04	4.095E-04	3.781E-04	2.853E-04	1.259E-04	6.637E-06
U-238	U-238	5.400E-05	2.683E-12	8.009E-12	1.848E-11	5.331E-11	1.384E-10	3.074E-10	2.980E-10	1.926E-11
U-238	U-238	9.999E-01	2.621E-04	2.609E-04	2.587E-04	2.510E-04	2.301E-04	1.695E-04	6.950E-05	2.745E-06
U-238	äDOSE(j)		2.621E-04	2.609E-04	2.587E-04	2.510E-04	2.301E-04	1.695E-04	6.950E-05	2.745E-06

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

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Maintenance Worker
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Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-227	Ac-227	1.000E+00	1.000E+00	9.686E-01	9.087E-01	7.269E-01	3.840E-01	4.117E-02	6.976E-05	1.398E-14
Ac-227	Pa-231	1.000E+00	0.000E+00	3.133E-02	9.107E-02	2.725E-01	6.138E-01	9.513E-01	9.766E-01	9.235E-01
Ac-227	U-235	1.000E+00	0.000E+00	3.326E-07	2.920E-06	2.978E-05	2.125E-04	1.186E-03	2.870E-03	3.503E-03
Ac-227	äS(j):		1.000E+00	9.999E-01	9.998E-01	9.993E-01	9.981E-01	9.936E-01	9.796E-01	9.270E-01
Pa-231	Pa-231	1.000E+00	1.000E+00	9.999E-01	9.998E-01	9.992E-01	9.976E-01	9.920E-01	9.763E-01	9.231E-01
Pa-231	U-235	1.000E+00	0.000E+00	2.110E-05	6.293E-05	2.057E-04	5.833E-04	1.611E-03	3.017E-03	3.505E-03
Pa-231	äS(j):		1.000E+00	9.999E-01	9.998E-01	9.994E-01	9.982E-01	9.936E-01	9.793E-01	9.266E-01
Pb-210	Pb-210	1.000E+00	1.000E+00	9.693E-01	9.108E-01	7.323E-01	3.927E-01	4.434E-02	8.718E-05	2.938E-14
Pb-210	Ra-226	1.000E+00	0.000E+00	3.060E-02	8.896E-02	2.665E-01	6.013E-01	9.236E-01	8.873E-01	6.533E-01
Pb-210	Th-230	1.000E+00	0.000E+00	6.662E-06	5.872E-05	6.075E-04	4.518E-03	2.939E-02	1.085E-01	3.332E-01
Pb-210	U-234	1.000E+00	0.000E+00	2.002E-11	5.305E-10	1.843E-08	4.183E-07	9.154E-06	8.576E-05	4.495E-04
Pb-210	U-238	9.999E-01	0.000E+00	1.420E-17	1.130E-15	1.315E-13	9.051E-12	6.682E-10	1.726E-08	1.821E-07
Pb-210	äS(j):		1.000E+00	9.999E-01	9.998E-01	9.993E-01	9.985E-01	9.974E-01	9.959E-01	9.870E-01
Ra-226	Ra-226	1.000E+00	1.000E+00	9.996E-01	9.987E-01	9.956E-01	9.870E-01	9.572E-01	8.770E-01	6.457E-01
Ra-226	Th-230	1.000E+00	0.000E+00	4.331E-04	1.299E-03	4.322E-03	1.290E-02	4.229E-02	1.210E-01	3.427E-01
Ra-226	U-234	1.000E+00	0.000E+00	1.946E-09	1.744E-08	1.911E-07	1.652E-06	1.603E-05	1.018E-04	4.657E-04
Ra-226	U-238	9.999E-01	0.000E+00	1.837E-15	4.931E-14	1.789E-12	4.558E-11	1.384E-09	2.200E-08	1.906E-07
Ra-226	äS(j):		1.000E+00	1.000E+00	1.000E+00	1.000E+00	9.999E-01	9.995E-01	9.981E-01	9.889E-01
Th-230	Th-230	1.000E+00	1.000E+00	1.000E+00	9.999E-01	9.996E-01	9.987E-01	9.956E-01	9.868E-01	9.567E-01
Th-230	U-234	1.000E+00	0.000E+00	8.976E-06	2.678E-05	8.751E-05	2.483E-04	6.865E-04	1.292E-03	1.535E-03
Th-230	U-238	9.999E-01	0.000E+00	1.271E-11	1.135E-10	1.229E-09	1.026E-08	8.830E-08	4.027E-07	7.625E-07
Th-230	äS(j):		1.000E+00	1.000E+00	9.999E-01	9.996E-01	9.989E-01	9.963E-01	9.881E-01	9.582E-01
U-234	U-234	1.000E+00	1.000E+00	9.944E-01	9.832E-01	9.452E-01	8.445E-01	5.693E-01	1.845E-01	3.574E-03
U-234	U-238	9.999E-01	0.000E+00	2.819E-06	8.362E-06	2.680E-05	7.182E-05	1.614E-04	1.570E-04	1.015E-05
U-234	äS(j):		1.000E+00	9.944E-01	9.832E-01	9.452E-01	8.446E-01	5.694E-01	1.846E-01	3.584E-03
U-235	U-235	1.000E+00	1.000E+00	9.944E-01	9.832E-01	9.452E-01	8.446E-01	5.694E-01	1.846E-01	3.584E-03
U-238	U-238	5.400E-05	5.400E-05	5.370E-05	5.310E-05	5.104E-05	4.561E-05	3.075E-05	9.970E-06	1.935E-07
U-238	U-238	9.999E-01	9.999E-01	9.943E-01	9.832E-01	9.452E-01	8.445E-01	5.694E-01	1.846E-01	3.584E-03
U-238	äS(j):		1.000E+00	9.944E-01	9.832E-01	9.452E-01	8.446E-01	5.694E-01	1.846E-01	3.584E-03

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

RESCALC.EXE execution time = 1.39 seconds

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Maintenance Worker
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Part III: Intake Quantities and Health Risk Factors

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Maintenance Worker
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Cancer Risk Slope Factors Summary Table
Risk Library: FGR 13 Morbidity

Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-1	Ground external radiation slope factors, 1/yr per (pCi/g):			
Sf-1	Ac-227+D	1.47E-06	3.48E-10	SLPF(1,1)
Sf-1	Pa-231	1.39E-07	1.39E-07	SLPF(2,1)
Sf-1	Pb-210+D	4.21E-09	1.41E-09	SLPF(3,1)
Sf-1	Ra-226+D	8.49E-06	2.29E-08	SLPF(4,1)
Sf-1	Th-230	8.19E-10	8.19E-10	SLPF(5,1)
Sf-1	U-234	2.52E-10	2.52E-10	SLPF(6,1)
Sf-1	U-235+D	5.43E-07	5.18E-07	SLPF(7,1)
Sf-1	U-238	4.99E-11	4.99E-11	SLPF(8,1)
Sf-1	U-238+D	1.14E-07	4.99E-11	SLPF(9,1)
Sf-2	Inhalation, slope factors, 1/(pCi):			
Sf-2	Ac-227+D	2.13E-07	1.49E-07	SLPF(1,2)
Sf-2	Pa-231	7.62E-08	7.62E-08	SLPF(2,2)
Sf-2	Pb-210+D	3.08E-08	1.58E-08	SLPF(3,2)
Sf-2	Ra-226+D	2.83E-08	2.82E-08	SLPF(4,2)
Sf-2	Th-230	3.40E-08	3.40E-08	SLPF(5,2)
Sf-2	U-234	2.78E-08	2.78E-08	SLPF(6,2)
Sf-2	U-235+D	2.50E-08	2.50E-08	SLPF(7,2)
Sf-2	U-238	2.36E-08	2.36E-08	SLPF(8,2)
Sf-2	U-238+D	2.36E-08	2.36E-08	SLPF(9,2)
Sf-3	Food ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.53E-10	2.45E-10	SLPF(1,3)
Sf-3	Pa-231	2.26E-10	2.26E-10	SLPF(2,3)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF(3,3)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF(4,3)
Sf-3	Th-230	1.19E-10	1.19E-10	SLPF(5,3)
Sf-3	U-234	9.55E-11	9.55E-11	SLPF(6,3)
Sf-3	U-235+D	9.76E-11	9.44E-11	SLPF(7,3)
Sf-3	U-238	8.66E-11	8.66E-11	SLPF(8,3)
Sf-3	U-238+D	1.21E-10	8.66E-11	SLPF(9,3)
Sf-3	Water ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	4.86E-10	2.01E-10	SLPF(1,4)
Sf-3	Pa-231	1.73E-10	1.73E-10	SLPF(2,4)
Sf-3	Pb-210+D	2.66E-09	8.81E-10	SLPF(3,4)
Sf-3	Ra-226+D	3.86E-10	3.85E-10	SLPF(4,4)
Sf-3	Th-230	9.10E-11	9.10E-11	SLPF(5,4)
Sf-3	U-234	7.07E-11	7.07E-11	SLPF(6,4)
Sf-3	U-235+D	7.18E-11	6.96E-11	SLPF(7,4)
Sf-3	U-238	6.40E-11	6.40E-11	SLPF(8,4)
Sf-3	U-238+D	8.71E-11	6.40E-11	SLPF(9,4)
Sf-3	Soil ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.53E-10	2.45E-10	SLPF(1,5)
Sf-3	Pa-231	2.26E-10	2.26E-10	SLPF(2,5)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF(3,5)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF(4,5)
Sf-3	Th-230	1.19E-10	1.19E-10	SLPF(5,5)

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Maintenance Worker
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Cancer Risk Slope Factors Summary Table (continued)
Risk Library: FGR 13 Morbidity

Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-3	U-234	9.55E-11	9.55E-11	SLPF(6,5)
Sf-3	U-235+D	9.76E-11	9.44E-11	SLPF(7,5)
Sf-3	U-238	8.66E-11	8.66E-11	SLPF(8,5)
Sf-3	U-238+D	1.21E-10	8.66E-11	SLPF(9,5)
Sf-Rn	Radon Inhalation slope factors, 1/(pCi):			
Sf-Rn	Rn-222	1.80E-12	1.80E-12	SLPFRN(1,1)
Sf-Rn	Po-218	3.70E-12	3.70E-12	SLPFRN(1,2)
Sf-Rn	Pb-214	6.20E-12	6.20E-12	SLPFRN(1,3)
Sf-Rn	Bi-214	1.50E-11	1.50E-11	SLPFRN(1,4)
Sf-Rn	Radon K factors, (mrem/WLM):			
Sf-Rn	Rn-222 Indoor	3.88E+02	3.88E+02	KFACTR(1,1)
Sf-Rn	Rn-222 Outdoor	3.88E+02	3.88E+02	KFACTR(1,2)

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

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Maintenance Worker

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Risk Slope and Environmental Transport Factors for the Ground Pathway

Nuclide	Slope(i)*	ETFG(i,t) At Time in Years (dimensionless)							
(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
Ac-227	3.480E-10	3.435E-04	3.440E-04	3.452E-04	3.492E-04	3.608E-04	4.049E-04	5.627E-04	1.780E-03
At-218	3.570E-09	1.151E-06	1.156E-06	1.165E-06	1.197E-06	1.293E-06	1.697E-06	3.689E-06	5.586E-05
Bi-210	2.760E-09	3.840E-04	3.845E-04	3.856E-04	3.893E-04	4.002E-04	4.409E-04	5.814E-04	1.531E-03
Bi-211	1.880E-07	1.243E-03	1.244E-03	1.247E-03	1.257E-03	1.286E-03	1.392E-03	1.747E-03	3.867E-03
Bi-214	7.480E-06	2.966E-03	2.969E-03	2.973E-03	2.990E-03	3.037E-03	3.208E-03	3.753E-03	6.498E-03
Fr-223	1.400E-07	6.378E-04	6.387E-04	6.404E-04	6.466E-04	6.647E-04	7.320E-04	9.640E-04	2.528E-03
Pa-231	1.390E-07	1.053E-03	1.054E-03	1.057E-03	1.065E-03	1.091E-03	1.187E-03	1.511E-03	3.511E-03
Pa-234	8.710E-06	2.222E-03	2.224E-03	2.228E-03	2.242E-03	2.282E-03	2.431E-03	2.909E-03	5.459E-03
Pa-234m	6.870E-08	1.836E-03	1.838E-03	1.841E-03	1.853E-03	1.887E-03	2.012E-03	2.414E-03	4.570E-03
Pb-210	1.410E-09	9.497E-09	9.553E-09	9.665E-09	1.007E-08	1.131E-08	1.702E-08	5.465E-08	3.243E-06
Pb-211	2.290E-07	1.849E-03	1.851E-03	1.854E-03	1.867E-03	1.904E-03	2.038E-03	2.478E-03	4.904E-03
Pb-214	9.820E-07	1.235E-03	1.236E-03	1.239E-03	1.249E-03	1.277E-03	1.383E-03	1.735E-03	3.842E-03
Po-210	3.950E-11	2.253E-03	2.255E-03	2.259E-03	2.273E-03	2.314E-03	2.463E-03	2.944E-03	5.499E-03
Po-211	3.580E-08	2.123E-03	2.125E-03	2.129E-03	2.142E-03	2.182E-03	2.327E-03	2.796E-03	5.316E-03
Po-214	3.860E-10	2.187E-03	2.189E-03	2.193E-03	2.207E-03	2.247E-03	2.394E-03	2.869E-03	5.407E-03
Po-215	7.480E-10	1.525E-03	1.527E-03	1.530E-03	1.541E-03	1.574E-03	1.694E-03	2.091E-03	4.365E-03
Po-218	4.260E-11	2.263E-03	2.265E-03	2.269E-03	2.283E-03	2.324E-03	2.474E-03	2.957E-03	5.523E-03
Ra-223	4.340E-07	7.073E-04	7.083E-04	7.102E-04	7.170E-04	7.367E-04	8.102E-04	1.063E-03	2.749E-03
Ra-226	2.290E-08	6.716E-04	6.725E-04	6.744E-04	6.809E-04	7.000E-04	7.712E-04	1.017E-03	2.678E-03
Rn-219	2.250E-07	1.268E-03	1.269E-03	1.272E-03	1.282E-03	1.311E-03	1.419E-03	1.778E-03	3.917E-03
Rn-222	1.740E-09	1.609E-03	1.610E-03	1.614E-03	1.625E-03	1.659E-03	1.784E-03	2.193E-03	4.521E-03
Th-227	3.780E-07	8.936E-04	8.947E-04	8.970E-04	9.050E-04	9.283E-04	1.014E-03	1.308E-03	3.178E-03
Th-230	8.190E-10	1.688E-04	1.691E-04	1.698E-04	1.721E-04	1.788E-04	2.043E-04	2.991E-04	1.136E-03
Th-231	2.450E-08	1.368E-04	1.371E-04	1.376E-04	1.396E-04	1.452E-04	1.670E-04	2.489E-04	1.006E-03
Th-234	1.630E-08	9.831E-05	9.852E-05	9.894E-05	1.004E-04	1.048E-04	1.217E-04	1.866E-04	8.322E-04
Tl-207	1.520E-08	1.363E-03	1.364E-03	1.367E-03	1.377E-03	1.405E-03	1.507E-03	1.843E-03	3.731E-03
Tl-210	0.000E+00	2.819E-03	2.821E-03	2.826E-03	2.842E-03	2.888E-03	3.055E-03	3.587E-03	6.294E-03
U-234	2.520E-10	1.138E-04	1.140E-04	1.145E-04	1.161E-04	1.209E-04	1.391E-04	2.079E-04	8.481E-04
U-235	5.180E-07	6.405E-04	6.414E-04	6.432E-04	6.496E-04	6.680E-04	7.370E-04	9.756E-04	2.604E-03
U-238	4.990E-11	3.071E-08	3.086E-08	3.118E-08	3.231E-08	3.578E-08	5.114E-08	1.418E-07	5.037E-06

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

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

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways				
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pa-231	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pb-210	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	4.070E-08	0.0627	9.840E-11	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.845E-11	0.0001
Pa-231	3.711E-09	0.0057	3.523E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.369E-11	0.0000
Pb-210	2.919E-11	0.0000	1.422E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.609E-10	0.0006
Ra-226	5.914E-07	0.9112	1.308E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.401E-11	0.0001
Th-230	3.539E-12	0.0000	1.572E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.248E-11	0.0000
U-234	6.856E-13	0.0000	1.172E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.129E-12	0.0000
U-235	7.951E-09	0.0123	1.054E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.333E-12	0.0000
U-238	4.512E-09	0.0070	9.962E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.153E-11	0.0000
Total	6.483E-07	0.9988	2.089E-10	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.496E-10	0.0008

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Maintenance Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.086E-08	0.0630
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.770E-09	0.0058
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.044E-10	0.0006
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.914E-07	0.9113
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.174E-11	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.153E-11	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.971E-09	0.0123
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.533E-09	0.0070
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.490E-07	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Maintenance Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground risk	Ground fract.	Inhalation risk	Inhalation fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	Soil risk	Soil fract.
Ac-227	2.801E-08	0.0432	5.895E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.101E-11	0.0001
Pa-231	1.639E-08	0.0253	7.466E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.112E-11	0.0001
Pb-210	2.025E-11	0.0000	8.616E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.187E-10	0.0003
Ra-226	5.882E-07	0.9062	1.857E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.952E-10	0.0003
Th-230	3.204E-09	0.0049	1.584E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.349E-11	0.0000
U-234	9.184E-13	0.0000	1.172E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.130E-12	0.0000
U-235	7.955E-09	0.0123	1.056E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.347E-12	0.0000
U-238	4.512E-09	0.0070	9.962E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.153E-11	0.0000
Total	6.483E-07	0.9988	2.089E-10	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.496E-10	0.0008

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

Water Dependent Pathways

Radio-Nuclide	Water risk	Water fract.	Fish risk	Fish fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	All pathways risk	All pathways fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.811E-08	0.0433
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.652E-08	0.0255
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.476E-10	0.0004
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.884E-07	0.9066
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.233E-09	0.0050
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.177E-11	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.975E-09	0.0123
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.533E-09	0.0070
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.490E-07	1.0000

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

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

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.481E-06	0.000E+00	0.000E+00	0.000E+00	3.358E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.358E-04
Pa-231	1.481E-06	0.000E+00	0.000E+00	0.000E+00	3.358E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.358E-04
Pb-210	1.481E-06	0.000E+00	0.000E+00	0.000E+00	3.358E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.358E-04
Ra-226	1.481E-06	0.000E+00	0.000E+00	0.000E+00	3.358E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.358E-04
Th-230	1.481E-06	0.000E+00	0.000E+00	0.000E+00	3.358E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.358E-04
U-234	1.473E-06	0.000E+00	0.000E+00	0.000E+00	3.340E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.340E-04
U-235	1.473E-06	0.000E+00	0.000E+00	0.000E+00	3.340E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.340E-04
U-238	1.473E-06	0.000E+00	0.000E+00	0.000E+00	3.340E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.340E-04

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	4.074E-08	0.0627	1.063E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.392E-11	0.0001
Pa-231	3.715E-09	0.0057	3.804E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.559E-11	0.0000
Pb-210	2.922E-11	0.0000	1.536E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.898E-10	0.0006
Ra-226	5.918E-07	0.9111	1.413E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.833E-11	0.0001
Th-230	3.545E-12	0.0000	1.698E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.348E-11	0.0000
U-234	6.831E-13	0.0000	1.261E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.821E-12	0.0000
U-235	7.918E-09	0.0122	1.134E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.004E-11	0.0000
U-238	4.491E-09	0.0069	1.072E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.240E-11	0.0000
Total	6.487E-07	0.9987	2.254E-10	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.934E-10	0.0009

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Maintenance Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.092E-08	0.0630
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.779E-09	0.0058
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.344E-10	0.0007
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.919E-07	0.9113
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.401E-11	0.0001
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.311E-11	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.939E-09	0.0122
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.514E-09	0.0069
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.496E-07	1.0000

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

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

Radionuclides

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.717E-08	0.0418	6.236E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.338E-11	0.0001
Pa-231	1.729E-08	0.0266	8.193E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.611E-11	0.0001
Pb-210	1.965E-11	0.0000	9.118E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.315E-10	0.0004
Ra-226	5.884E-07	0.9058	2.023E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.155E-10	0.0003
Th-230	3.461E-09	0.0053	1.711E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.464E-11	0.0000
U-234	9.447E-13	0.0000	1.261E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.823E-12	0.0000
U-235	7.921E-09	0.0122	1.136E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.006E-11	0.0000
U-238	4.491E-09	0.0069	1.072E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.240E-11	0.0000
Total	6.487E-07	0.9987	2.254E-10	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.934E-10	0.0009

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.727E-08	0.0420
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.743E-08	0.0268
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.602E-10	0.0004
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.886E-07	0.9062
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.493E-09	0.0054
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.338E-11	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.943E-09	0.0122
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.514E-09	0.0069
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.496E-07	1.0000

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

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

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways				
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	4.442E-06	0.000E+00	0.000E+00	0.000E+00	1.007E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.007E-03
Pa-231	4.442E-06	0.000E+00	0.000E+00	0.000E+00	1.007E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.007E-03
Pb-210	4.442E-06	0.000E+00	0.000E+00	0.000E+00	1.007E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.007E-03
Ra-226	4.443E-06	0.000E+00	0.000E+00	0.000E+00	1.007E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.007E-03
Th-230	4.442E-06	0.000E+00	0.000E+00	0.000E+00	1.007E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.007E-03
U-234	4.368E-06	0.000E+00	0.000E+00	0.000E+00	9.906E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.906E-04
U-235	4.368E-06	0.000E+00	0.000E+00	0.000E+00	9.906E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.906E-04
U-238	4.368E-06	0.000E+00	0.000E+00	0.000E+00	9.906E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.906E-04

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	4.083E-08	0.0628	1.220E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.486E-11	0.0001
Pa-231	3.724E-09	0.0057	4.368E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.937E-11	0.0000
Pb-210	2.930E-11	0.0000	1.763E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.475E-10	0.0007
Ra-226	5.928E-07	0.9111	1.622E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.698E-11	0.0001
Th-230	3.558E-12	0.0000	1.950E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.547E-11	0.0000
U-234	6.781E-13	0.0000	1.435E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.118E-11	0.0000
U-235	7.851E-09	0.0121	1.291E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.143E-11	0.0000
U-238	4.448E-09	0.0068	1.220E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.412E-11	0.0000
Total	6.497E-07	0.9986	2.585E-10	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.810E-10	0.0010

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Maintenance Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.104E-08	0.0631
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.797E-09	0.0058
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.945E-10	0.0008
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.929E-07	0.9112
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.853E-11	0.0001
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.621E-11	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.876E-09	0.0121
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.475E-09	0.0069
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.506E-07	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Maintenance Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.555E-08	0.0393	6.837E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.756E-11	0.0001
Pa-231	1.901E-08	0.0292	9.727E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.666E-11	0.0001
Pb-210	1.851E-11	0.0000	1.001E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.541E-10	0.0004
Ra-226	5.888E-07	0.9050	2.367E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.589E-10	0.0004
Th-230	3.977E-09	0.0061	1.966E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.697E-11	0.0000
U-234	1.004E-12	0.0000	1.436E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.118E-11	0.0000
U-235	7.856E-09	0.0121	1.294E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.145E-11	0.0000
U-238	4.448E-09	0.0068	1.220E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.412E-11	0.0000
Total	6.497E-07	0.9986	2.585E-10	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.810E-10	0.0010

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.566E-08	0.0394
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.917E-08	0.0295
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.826E-10	0.0004
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.891E-07	0.9055
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.014E-09	0.0062
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.654E-11	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.880E-09	0.0121
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.475E-09	0.0069
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.506E-07	1.0000

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

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

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.480E-05	0.000E+00	0.000E+00	0.000E+00	3.356E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.356E-03
Pa-231	1.480E-05	0.000E+00	0.000E+00	0.000E+00	3.356E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.356E-03
Pb-210	1.480E-05	0.000E+00	0.000E+00	0.000E+00	3.356E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.356E-03
Ra-226	1.481E-05	0.000E+00	0.000E+00	0.000E+00	3.358E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.358E-03
Th-230	1.480E-05	0.000E+00	0.000E+00	0.000E+00	3.357E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.357E-03
U-234	1.400E-05	0.000E+00	0.000E+00	0.000E+00	3.174E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.174E-03
U-235	1.400E-05	0.000E+00	0.000E+00	0.000E+00	3.174E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.174E-03
U-238	1.400E-05	0.000E+00	0.000E+00	0.000E+00	3.174E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.174E-03

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	4.115E-08	0.0629	1.770E-10	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.231E-10	0.0002
Pa-231	3.754E-09	0.0057	6.338E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.262E-11	0.0001
Pb-210	2.957E-11	0.0000	2.558E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.495E-10	0.0010
Ra-226	5.961E-07	0.9110	2.355E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.722E-11	0.0001
Th-230	3.605E-12	0.0000	2.830E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.246E-11	0.0000
U-234	6.612E-13	0.0000	2.015E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.570E-11	0.0000
U-235	7.623E-09	0.0116	1.812E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.605E-11	0.0000
U-238	4.304E-09	0.0066	1.713E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.983E-11	0.0000
Total	6.530E-07	0.9979	3.732E-10	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.865E-10	0.0015

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Maintenance Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.145E-08	0.0633
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.860E-09	0.0059
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.046E-10	0.0011
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.962E-07	0.9112
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.436E-11	0.0001
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.651E-11	0.0001
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.657E-09	0.0117
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.341E-09	0.0066
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.543E-07	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Maintenance Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.060E-08	0.0315	8.232E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.726E-11	0.0001
Pa-231	2.429E-08	0.0371	1.580E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.085E-10	0.0002
Pb-210	1.503E-11	0.0000	1.210E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.072E-10	0.0005
Ra-226	5.903E-07	0.9022	3.669E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.363E-10	0.0007
Th-230	5.791E-09	0.0089	2.863E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.570E-11	0.0000
U-234	1.279E-12	0.0000	2.016E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.570E-11	0.0000
U-235	7.630E-09	0.0117	1.818E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.609E-11	0.0000
U-238	4.304E-09	0.0066	1.713E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.983E-11	0.0000
Total	6.530E-07	0.9979	3.732E-10	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.865E-10	0.0015

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

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.074E-08	0.0317
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.456E-08	0.0375
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.343E-10	0.0005
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.908E-07	0.9029
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.845E-09	0.0089
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.714E-11	0.0001
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.664E-09	0.0117
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.341E-09	0.0066
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.543E-07	1.0000

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

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 3.000E+01 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	4.434E-05	0.000E+00	0.000E+00	0.000E+00	1.005E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.005E-02
Pa-231	4.435E-05	0.000E+00	0.000E+00	0.000E+00	1.006E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.006E-02
Pb-210	4.436E-05	0.000E+00	0.000E+00	0.000E+00	1.006E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.006E-02
Ra-226	4.442E-05	0.000E+00	0.000E+00	0.000E+00	1.007E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.007E-02
Th-230	4.438E-05	0.000E+00	0.000E+00	0.000E+00	1.006E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.006E-02
U-234	3.752E-05	0.000E+00	0.000E+00	0.000E+00	8.508E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.508E-03
U-235	3.752E-05	0.000E+00	0.000E+00	0.000E+00	8.508E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.508E-03
U-238	3.752E-05	0.000E+00	0.000E+00	0.000E+00	8.508E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.508E-03

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

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 3.000E+01 years

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

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

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	4.206E-08	0.0632	3.340E-10	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.323E-10	0.0003
Pa-231	3.840E-09	0.0058	1.196E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.042E-11	0.0001
Pb-210	3.035E-11	0.0000	4.830E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.226E-09	0.0018
Ra-226	6.057E-07	0.9107	4.447E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.836E-10	0.0003
Th-230	3.743E-12	0.0000	5.341E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.239E-11	0.0001
U-234	6.149E-13	0.0000	3.422E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.666E-11	0.0000
U-235	7.005E-09	0.0105	3.078E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.726E-11	0.0000
U-238	3.917E-09	0.0059	2.909E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.367E-11	0.0001
Total	6.626E-07	0.9962	6.938E-10	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.852E-09	0.0028

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.263E-08	0.0641
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.040E-09	0.0061
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.305E-09	0.0020
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.059E-07	0.9110
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.954E-11	0.0001
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.149E-11	0.0001
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.063E-09	0.0106
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.980E-09	0.0060
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.651E-07	1.0000

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

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+01 years

Radionuclides

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

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

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Maintenance Worker
File : C:\USERS\H5TDERJC\DESKTOP\NFSS\02 - VPH\13 - RISK ASSESSMENT\04 - RESRAD\FINAL\MW SUBSURFACE SOIL.RAD

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.114E-08	0.0167	8.520E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.926E-11	0.0001
Pa-231	3.474E-08	0.0522	3.681E-10	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.533E-10	0.0004
Pb-210	8.278E-12	0.0000	1.270E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.224E-10	0.0005
Ra-226	5.947E-07	0.8941	7.882E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.073E-09	0.0016
Th-230	1.105E-08	0.0166	5.464E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.638E-11	0.0001
U-234	2.627E-12	0.0000	3.424E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.667E-11	0.0000
U-235	7.024E-09	0.0106	3.101E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.741E-11	0.0000
U-238	3.917E-09	0.0059	2.909E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.367E-11	0.0001
Total	6.626E-07	0.9962	6.938E-10	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.852E-09	0.0028

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.128E-08	0.0170
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.536E-08	0.0532
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.434E-10	0.0005
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.958E-07	0.8958
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.116E-08	0.0168
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.353E-11	0.0001
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.083E-09	0.0106
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.980E-09	0.0060
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.651E-07	1.0000

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

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

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.471E-04	0.000E+00	0.000E+00	0.000E+00	3.337E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.337E-02
Pa-231	1.471E-04	0.000E+00	0.000E+00	0.000E+00	3.337E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.337E-02
Pb-210	1.477E-04	0.000E+00	0.000E+00	0.000E+00	3.349E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.349E-02
Ra-226	1.480E-04	0.000E+00	0.000E+00	0.000E+00	3.356E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.356E-02
Th-230	1.475E-04	0.000E+00	0.000E+00	0.000E+00	3.345E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.345E-02
U-234	8.433E-05	0.000E+00	0.000E+00	0.000E+00	1.912E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.912E-02
U-235	8.433E-05	0.000E+00	0.000E+00	0.000E+00	1.912E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.912E-02
U-238	8.433E-05	0.000E+00	0.000E+00	0.000E+00	1.912E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.912E-02

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	4.542E-08	0.0645	8.801E-10	0.0012	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.122E-10	0.0009
Pa-231	4.159E-09	0.0059	3.151E-10	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.119E-10	0.0003
Pb-210	3.332E-11	0.0000	1.277E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.243E-09	0.0046
Ra-226	6.405E-07	0.9089	1.177E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.859E-10	0.0007
Th-230	4.266E-12	0.0000	1.410E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.119E-10	0.0002
U-234	4.772E-13	0.0000	6.134E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.778E-11	0.0001
U-235	5.213E-09	0.0074	5.517E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.885E-11	0.0001
U-238	2.816E-09	0.0040	5.214E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.035E-11	0.0001
Total	6.981E-07	0.9907	1.750E-09	0.0025	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.822E-09	0.0068

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Maintenance Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.691E-08	0.0666
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.686E-09	0.0066
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.404E-09	0.0048
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.411E-07	0.9097
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.572E-10	0.0004
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.096E-10	0.0002
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.317E-09	0.0075
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.929E-09	0.0042
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.047E-07	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Maintenance Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.295E-09	0.0018	2.478E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.724E-11	0.0000
Pa-231	4.821E-08	0.0684	1.169E-09	0.0017	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.057E-10	0.0011
Pb-210	1.027E-12	0.0000	3.889E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.873E-11	0.0001
Ra-226	6.101E-07	0.8657	2.315E-10	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.494E-09	0.0050
Th-230	3.041E-08	0.0432	1.509E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.475E-10	0.0004
U-234	1.322E-11	0.0000	6.143E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.790E-11	0.0001
U-235	5.282E-09	0.0075	5.692E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.006E-11	0.0001
U-238	2.816E-09	0.0040	5.216E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.036E-11	0.0001
Total	6.981E-07	0.9907	1.750E-09	0.0025	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.822E-09	0.0068

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.337E-09	0.0019
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.019E-08	0.0712
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.036E-10	0.0001
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.138E-07	0.8710
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.081E-08	0.0437
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.226E-10	0.0002
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.389E-09	0.0076
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.929E-09	0.0042
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.047E-07	1.0000

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

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

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	4.352E-04	0.000E+00	0.000E+00	0.000E+00	9.868E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.868E-02
Pa-231	4.351E-04	0.000E+00	0.000E+00	0.000E+00	9.866E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.866E-02
Pb-210	4.425E-04	0.000E+00	0.000E+00	0.000E+00	1.003E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.003E-01
Ra-226	4.434E-04	0.000E+00	0.000E+00	0.000E+00	1.005E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.005E-01
Th-230	4.390E-04	0.000E+00	0.000E+00	0.000E+00	9.954E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.954E-02
U-234	8.203E-05	0.000E+00	0.000E+00	0.000E+00	1.860E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.860E-02
U-235	8.203E-05	0.000E+00	0.000E+00	0.000E+00	1.860E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.860E-02
U-238	8.203E-05	0.000E+00	0.000E+00	0.000E+00	1.860E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.860E-02

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	5.652E-08	0.0678	2.410E-09	0.0029	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.676E-09	0.0020
Pa-231	5.215E-09	0.0063	8.625E-10	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.801E-10	0.0007
Pb-210	4.358E-11	0.0001	3.543E-10	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.995E-09	0.0108
Ra-226	7.512E-07	0.9009	3.264E-10	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.348E-09	0.0016
Th-230	6.194E-12	0.0000	3.885E-10	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.083E-10	0.0004
U-234	2.312E-13	0.0000	5.534E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.311E-11	0.0001
U-235	2.240E-09	0.0027	4.977E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.408E-11	0.0001
U-238	1.098E-09	0.0013	4.704E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.444E-11	0.0001
Total	8.163E-07	0.9790	4.494E-09	0.0054	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.305E-08	0.0156

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Maintenance Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.060E-08	0.0727
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.658E-09	0.0080
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.393E-09	0.0113
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.528E-07	0.9029
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.030E-10	0.0008
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.868E-11	0.0001
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.334E-09	0.0028
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.199E-09	0.0014
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.338E-07	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Maintenance Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.771E-12	0.0000	1.178E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.191E-14	0.0000
Pa-231	6.154E-08	0.0738	3.263E-09	0.0039	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.250E-09	0.0027
Pb-210	2.645E-15	0.0000	2.144E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.442E-13	0.0000
Ra-226	6.565E-07	0.7874	5.992E-10	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.148E-09	0.0110
Th-230	9.459E-08	0.1134	4.694E-10	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.501E-09	0.0018
U-234	8.180E-11	0.0001	5.588E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.446E-11	0.0001
U-235	2.426E-09	0.0029	5.967E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.090E-11	0.0001
U-238	1.098E-09	0.0013	4.709E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.448E-11	0.0001
Total	8.163E-07	0.9790	4.494E-09	0.0054	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.305E-08	0.0156

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.970E-12	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.706E-08	0.0804
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.683E-13	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.663E-07	0.7991
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.656E-08	0.1158
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.821E-10	0.0002
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.536E-09	0.0030
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.199E-09	0.0014
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.338E-07	1.0000

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

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

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.373E-03	0.000E+00	0.000E+00	0.000E+00	3.113E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.113E-01
Pa-231	1.372E-03	0.000E+00	0.000E+00	0.000E+00	3.112E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.112E-01
Pb-210	1.462E-03	0.000E+00	0.000E+00	0.000E+00	3.314E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.314E-01
Ra-226	1.464E-03	0.000E+00	0.000E+00	0.000E+00	3.321E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.321E-01
Th-230	1.419E-03	0.000E+00	0.000E+00	0.000E+00	3.218E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.218E-01
U-234	5.308E-06	0.000E+00	0.000E+00	0.000E+00	1.204E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.204E-03
U-235	5.308E-06	0.000E+00	0.000E+00	0.000E+00	1.204E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.204E-03
U-238	5.308E-06	0.000E+00	0.000E+00	0.000E+00	1.204E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.204E-03

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.216E-07	0.0812	7.389E-09	0.0049	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.140E-09	0.0034
Pa-231	1.147E-08	0.0077	2.644E-09	0.0018	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.778E-09	0.0012
Pb-210	1.116E-10	0.0001	1.138E-09	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.888E-08	0.0193
Ra-226	1.310E-06	0.8745	1.048E-09	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.326E-09	0.0029
Th-230	2.281E-11	0.0000	1.221E-09	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.687E-10	0.0006
U-234	1.831E-14	0.0000	3.483E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.713E-12	0.0000
U-235	1.168E-10	0.0001	3.132E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.774E-12	0.0000
U-238	4.089E-11	0.0000	2.961E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.427E-12	0.0000
Total	1.443E-06	0.9636	1.345E-08	0.0090	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.110E-08	0.0274

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Maintenance Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

Water Dependent Pathways

	Water		Fish		Plant		Meat		Milk		All Pathways**	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.341E-07	0.0896
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.589E-08	0.0106
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.013E-08	0.0201
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.315E-06	0.8781
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.212E-09	0.0015
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.214E-12	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.227E-10	0.0001
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.728E-11	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.497E-06	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Maintenance Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.262E-21	0.0000	7.672E-23	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.337E-23	0.0000
Pa-231	1.326E-07	0.0885	9.995E-09	0.0067	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.892E-09	0.0046
Pb-210	2.303E-24	0.0000	2.349E-23	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.963E-22	0.0000
Ra-226	8.507E-07	0.5681	1.430E-09	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.182E-08	0.0146
Th-230	4.584E-07	0.3061	1.973E-09	0.0013	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.233E-08	0.0082
U-234	6.245E-10	0.0004	6.453E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.965E-11	0.0000
U-235	6.199E-10	0.0004	4.107E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.893E-11	0.0000
U-238	4.115E-11	0.0000	2.972E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.441E-12	0.0000
Total	1.443E-06	0.9636	1.345E-08	0.0090	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.110E-08	0.0274

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.392E-21	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.495E-07	0.0998
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.221E-22	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.740E-07	0.5836
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.727E-07	0.3156
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.506E-10	0.0004
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.899E-10	0.0005
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.756E-11	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.497E-06	1.0000

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

Adolescent Trespasser
RESRAD Output Files

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser
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Part I: Mixture Sums and Single Radionuclide Guidelines

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser
File : C:\USERS\H5TDERJC\DESKTOP\NFSS\02 - VPH\13 - RISK ASSESSMENT\04 - RESRAD\FINAL\ADOLESCENT TR SURFACE SOIL.RAD

Dose Conversion Factor (and Related) Parameter Summary
Dose Library: ICRP 72 (Age 15)

Menu	Parameter	Current Value#	Base Case*	Parameter Name
A-1	DCF's for external ground radiation, (mrem/yr)/(pCi/g)			
A-1	Ac-227 (Source: ICRP 60)	4.485E-04	4.485E-04	DCF1(1)
A-1	At-218 (Source: ICRP 60)	4.878E-03	4.878E-03	DCF1(2)
A-1	Bi-210 (Source: ICRP 60)	5.476E-03	5.476E-03	DCF1(3)
A-1	Bi-211 (Source: ICRP 60)	2.373E-01	2.373E-01	DCF1(4)
A-1	Bi-214 (Source: ICRP 60)	9.325E+00	9.325E+00	DCF1(5)
A-1	Fr-223 (Source: ICRP 60)	1.813E-01	1.813E-01	DCF1(6)
A-1	Pa-231 (Source: ICRP 60)	1.762E-01	1.762E-01	DCF1(7)
A-1	Pa-234 (Source: ICRP 60)	1.088E+01	1.088E+01	DCF1(8)
A-1	Pa-234m (Source: ICRP 60)	9.867E-02	9.867E-02	DCF1(9)
A-1	Pb-210 (Source: ICRP 60)	1.981E-03	1.981E-03	DCF1(10)
A-1	Pb-211 (Source: ICRP 60)	2.915E-01	2.915E-01	DCF1(11)
A-1	Pb-214 (Source: ICRP 60)	1.243E+00	1.243E+00	DCF1(12)
A-1	Po-210 (Source: ICRP 60)	4.934E-05	4.934E-05	DCF1(13)
A-1	Po-211 (Source: ICRP 60)	4.485E-02	4.485E-02	DCF1(14)
A-1	Po-214 (Source: ICRP 60)	4.840E-04	4.840E-04	DCF1(15)
A-1	Po-215 (Source: ICRP 60)	9.456E-04	9.456E-04	DCF1(16)
A-1	Po-218 (Source: ICRP 60)	5.326E-05	5.326E-05	DCF1(17)
A-1	Ra-223 (Source: ICRP 60)	5.532E-01	5.532E-01	DCF1(18)
A-1	Ra-226 (Source: ICRP 60)	2.915E-02	2.915E-02	DCF1(19)
A-1	Rn-219 (Source: ICRP 60)	2.859E-01	2.859E-01	DCF1(20)
A-1	Rn-222 (Source: ICRP 60)	2.186E-03	2.186E-03	DCF1(21)
A-1	Th-227 (Source: ICRP 60)	4.803E-01	4.803E-01	DCF1(22)
A-1	Th-230 (Source: ICRP 60)	1.071E-03	1.071E-03	DCF1(23)
A-1	Th-231 (Source: ICRP 60)	3.214E-02	3.214E-02	DCF1(24)
A-1	Th-234 (Source: ICRP 60)	2.130E-02	2.130E-02	DCF1(25)
A-1	Tl-207 (Source: ICRP 60)	2.299E-02	2.299E-02	DCF1(26)
A-1	Tl-210 (Source: ICRP 60)	1.661E+01	1.661E+01	DCF1(27)
A-1	U-234 (Source: ICRP 60)	3.439E-04	3.439E-04	DCF1(28)
A-1	U-235 (Source: ICRP 60)	6.597E-01	6.597E-01	DCF1(29)
A-1	U-238 (Source: ICRP 60)	7.961E-05	7.961E-05	DCF1(30)
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	2.160E+00	2.072E+00	DCF2(1)
B-1	Pa-231	5.550E-01	5.550E-01	DCF2(2)
B-1	Pb-210+D	4.111E-02	2.183E-02	DCF2(3)
B-1	Ra-226+D	3.712E-02	3.700E-02	DCF2(4)
B-1	Th-230	3.663E-01	3.663E-01	DCF2(5)
B-1	U-234	3.700E-02	3.700E-02	DCF2(6)
B-1	U-235+D	3.404E-02	3.404E-02	DCF2(7)
B-1	U-238	3.219E-02	3.219E-02	DCF2(8)
B-1	U-238+D	3.222E-02	3.219E-02	DCF2(9)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	5.865E-03	4.440E-03	DCF3(1)
D-1	Pa-231	2.960E-03	2.960E-03	DCF3(2)
D-1	Pb-210+D	1.296E-02	7.030E-03	DCF3(3)
D-1	Ra-226+D	5.551E-03	5.550E-03	DCF3(4)
D-1	Th-230	8.140E-04	8.140E-04	DCF3(5)
D-1	U-234	2.738E-04	2.738E-04	DCF3(6)

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser
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Dose Conversion Factor (and Related) Parameter Summary (continued)
Dose Library: ICRP 72 (Age 15)

Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-1	U-235+D	2.606E-04	2.590E-04	DCF3(7)
D-1	U-238	2.479E-04	2.479E-04	DCF3(8)
D-1	U-238+D	2.634E-04	2.479E-04	DCF3(9)
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	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(2,1)
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(2,2)
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(2,3)
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(3,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(3,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(3,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(4,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(4,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(4,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(5,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(5,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(5,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(6,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(6,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(6,3)
D-34				
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(7,1)
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(7,2)
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(7,3)
D-34				
D-34	U-238 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(8,1)
D-34	U-238 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(8,2)
D-34	U-238 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(8,3)
D-34				
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(9,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(9,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(9,3)
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	Pa-231 , fish	1.000E+01	1.000E+01	BIOFAC(2,1)
D-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(2,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(3,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(3,2)

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser

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Dose Conversion Factor (and Related) Parameter Summary (continued)

Dose Library: ICRP 72 (Age 15)

Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(4,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(4,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(5,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(5,2)
D-5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(6,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(6,2)
D-5				
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIOFAC(7,1)
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(7,2)
D-5				
D-5	U-238 , fish	1.000E+01	1.000E+01	BIOFAC(8,1)
D-5	U-238 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(8,2)
D-5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(9,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(9,2)

#For DCF1(xxx) only, factors are for infinite depth & area. See ETFG table in Ground Pathway of Detailed Report.

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

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser
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Site-Specific Parameter Summary

Menu	Parameter	User Input	Used by RESRAD Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.620E+04	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	1.500E-01	2.000E+00	---	THICK0
R011	Fraction of contamination that is submerged	0.000E+00	0.000E+00	---	SUBMFRACT
R011	Length parallel to aquifer flow (m)	1.000E+02	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Ac-227	1.000E+00	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g): Pa-231	1.000E+00	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Pb-210	1.000E+00	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): Ra-226	1.000E+00	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Th-230	1.000E+00	0.000E+00	---	S1(5)
R012	Initial principal radionuclide (pCi/g): U-234	1.000E+00	0.000E+00	---	S1(6)
R012	Initial principal radionuclide (pCi/g): U-235	1.000E+00	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): U-238	1.000E+00	0.000E+00	---	S1(8)
R012	Concentration in groundwater (pCi/L): Ac-227	not used	0.000E+00	---	W1(1)
R012	Concentration in groundwater (pCi/L): Pa-231	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Pb-210	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	W1(4)
R012	Concentration in groundwater (pCi/L): Th-230	not used	0.000E+00	---	W1(5)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(6)
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	---	W1(7)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(8)
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)	1.700E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	6.000E-05	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.200E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	3.600E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	6.840E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	1.040E+01	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	4.400E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	9.000E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	4.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.000E+06	1.000E+06	---	WAREA

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	4.000E-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)	1.000E+02	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	---	HGWT
R014	Saturated zone b parameter	5.300E+00	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	1.000E-03	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	---	UW
R015	Number of unsaturated zone strata	1	1	---	NS
R015	Unsat. zone 1, thickness (m)	4.000E+00	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.500E+00	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	4.000E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	2.000E-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	5.300E+00	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for 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	7.179E-02	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for Pa-231				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.890E-02	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Pb-210				
R016	Contaminated zone (cm**3/g)	2.100E+03	1.000E+02	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	2.100E+03	1.000E+02	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	2.100E+03	1.000E+02	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	6.909E-04	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	3.800E+04	7.000E+01	---	DCNUCC(4)
R016	Unsaturated zone 1 (cm**3/g)	3.800E+04	7.000E+01	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	3.800E+04	7.000E+01	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.818E-05	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Th-230				
R016	Contaminated zone (cm**3/g)	4.500E+03	6.000E+04	---	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	4.500E+03	6.000E+04	---	DCNUCU(5,1)
R016	Saturated zone (cm**3/g)	4.500E+03	6.000E+04	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.224E-04	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(6)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.890E-02	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R016	Distribution coefficients for U-235				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(7)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(7,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.890E-02	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(8)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(8,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.890E-02	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R017	Inhalation rate (m**3/yr)	2.000E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	6.000E+00	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	1.000E+00	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	1.200E-02	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)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	1.016E+02	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	not used	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	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	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	not used	-1	---	FPLANT
R018	Contamination fraction of meat	2.230E-01	-1	---	FMEAT
R018	Contamination fraction of milk	not used	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	6.800E+01	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	5.000E+01	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	not used	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	not used	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	0.000E+00	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	0.000E+00	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	1.100E+00	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	not used	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	8.000E-02	8.000E-02	---	TE(3)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	not used	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	1.000E+00	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	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)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
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	0.000E+00	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

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser
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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	257	---	---	KYMAX

Summary of Pathway Selections

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

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser

File : C:\USERS\H5TDERJC\DESKTOP\NFSS\02 - VPH\13 - RISK ASSESSMENT\04 - RESRAD\FINAL\ADOLESCENT TR SURFACE SOIL.RAD

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	16200.00 square meters	Ac-227	1.000E+00
Thickness:	0.15 meters	Pa-231	1.000E+00
Cover Depth:	0.00 meters	Pb-210	1.000E+00
		Ra-226	1.000E+00
		Th-230	1.000E+00
		U-234	1.000E+00
		U-235	1.000E+00
		U-238	1.000E+00

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):	6.333E-01	6.248E-01	6.087E-01	5.616E-01	4.758E-01	3.799E-01	3.387E-01	2.329E-01
M(t):	2.533E-02	2.499E-02	2.435E-02	2.247E-02	1.903E-02	1.520E-02	1.355E-02	9.317E-03

Maximum TDOSE(t): 6.333E-01 mrem/yr at t = 0.000E+00 years

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	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.
Ac-227	1.985E-02	0.0313	3.963E-03	0.0063	0.000E+00	0.0000	0.000E+00	0.0000	1.339E-03	0.0021	0.000E+00	0.0000	2.440E-03	0.0039
Pa-231	2.265E-03	0.0036	1.120E-03	0.0018	0.000E+00	0.0000	0.000E+00	0.0000	2.037E-01	0.3217	0.000E+00	0.0000	1.317E-03	0.0021
Pb-210	8.580E-05	0.0001	7.814E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	1.418E-01	0.2239	0.000E+00	0.0000	5.584E-03	0.0088
Ra-226	1.096E-01	0.1730	7.289E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	1.223E-01	0.1931	0.000E+00	0.0000	2.518E-03	0.0040
Th-230	3.616E-05	0.0001	7.073E-04	0.0011	0.000E+00	0.0000	0.000E+00	0.0000	9.666E-04	0.0015	0.000E+00	0.0000	3.569E-04	0.0006
U-234	3.961E-06	0.0000	7.043E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	1.100E-03	0.0017	0.000E+00	0.0000	1.182E-04	0.0002
U-235	7.784E-03	0.0123	6.481E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	1.049E-03	0.0017	0.000E+00	0.0000	1.125E-04	0.0002
U-238	1.670E-03	0.0026	6.134E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	1.059E-03	0.0017	0.000E+00	0.0000	1.137E-04	0.0002
Total	1.412E-01	0.2230	6.138E-03	0.0097	0.000E+00	0.0000	0.000E+00	0.0000	4.733E-01	0.7474	0.000E+00	0.0000	1.256E-02	0.0198

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.759E-02	0.0436
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.084E-01	0.3291
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.475E-01	0.2329
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.344E-01	0.3702
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.067E-03	0.0033
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.293E-03	0.0020
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.010E-03	0.0142
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.903E-03	0.0046
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.333E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser
File : C:\USERS\H5TDERJC\DESKTOP\NFSS\02 - VPH\13 - RISK ASSESSMENT\04 - RESRAD\FINAL\ADOLESCENT TR SURFACE SOIL.RAD

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	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.
Ac-227	1.789E-02	0.0286	3.571E-03	0.0057	0.000E+00	0.0000	0.000E+00	0.0000	1.207E-03	0.0019	0.000E+00	0.0000	2.199E-03	0.0035
Pa-231	2.792E-03	0.0045	1.206E-03	0.0019	0.000E+00	0.0000	0.000E+00	0.0000	1.979E-01	0.3168	0.000E+00	0.0000	1.351E-03	0.0022
Pb-210	8.312E-05	0.0001	7.566E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	1.373E-01	0.2197	0.000E+00	0.0000	5.408E-03	0.0087
Ra-226	1.095E-01	0.1753	7.521E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	1.265E-01	0.2025	0.000E+00	0.0000	2.686E-03	0.0043
Th-230	8.358E-05	0.0001	7.068E-04	0.0011	0.000E+00	0.0000	0.000E+00	0.0000	1.020E-03	0.0016	0.000E+00	0.0000	3.578E-04	0.0006
U-234	3.849E-06	0.0000	6.841E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	1.068E-03	0.0017	0.000E+00	0.0000	1.148E-04	0.0002
U-235	7.562E-03	0.0121	6.296E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	1.023E-03	0.0016	0.000E+00	0.0000	1.093E-04	0.0002
U-238	1.622E-03	0.0026	5.957E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	1.028E-03	0.0016	0.000E+00	0.0000	1.104E-04	0.0002
Total	1.395E-01	0.2233	5.826E-03	0.0093	0.000E+00	0.0000	0.000E+00	0.0000	4.671E-01	0.7476	0.000E+00	0.0000	1.234E-02	0.0197

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.487E-02	0.0398
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.033E-01	0.3253
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.428E-01	0.2286
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.388E-01	0.3822
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.168E-03	0.0035
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.255E-03	0.0020
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.757E-03	0.0140
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.820E-03	0.0045
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.248E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 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.
Ac-227	1.454E-02	0.0239	2.901E-03	0.0048	0.000E+00	0.0000	0.000E+00	0.0000	9.801E-04	0.0016	0.000E+00	0.0000	1.786E-03	0.0029
Pa-231	3.634E-03	0.0060	1.336E-03	0.0022	0.000E+00	0.0000	0.000E+00	0.0000	1.867E-01	0.3067	0.000E+00	0.0000	1.397E-03	0.0023
Pb-210	7.800E-05	0.0001	7.095E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	1.287E-01	0.2115	0.000E+00	0.0000	5.071E-03	0.0083
Ra-226	1.094E-01	0.1797	7.963E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	1.346E-01	0.2211	0.000E+00	0.0000	3.007E-03	0.0049
Th-230	1.783E-04	0.0003	7.058E-04	0.0012	0.000E+00	0.0000	0.000E+00	0.0000	1.131E-03	0.0019	0.000E+00	0.0000	3.597E-04	0.0006
U-234	3.635E-06	0.0000	6.453E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	1.008E-03	0.0017	0.000E+00	0.0000	1.083E-04	0.0002
U-235	7.137E-03	0.0117	5.943E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	9.725E-04	0.0016	0.000E+00	0.0000	1.031E-04	0.0002
U-238	1.531E-03	0.0025	5.618E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	9.695E-04	0.0016	0.000E+00	0.0000	1.041E-04	0.0002
Total	1.365E-01	0.2242	5.273E-03	0.0087	0.000E+00	0.0000	0.000E+00	0.0000	4.551E-01	0.7475	0.000E+00	0.0000	1.194E-02	0.0196

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.021E-02	0.0332
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.931E-01	0.3172
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.339E-01	0.2200
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.470E-01	0.4058
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.375E-03	0.0039
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.184E-03	0.0019
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.272E-03	0.0136
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.661E-03	0.0044
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.087E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 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.
Ac-227	7.038E-03	0.0125	1.400E-03	0.0025	0.000E+00	0.0000	0.000E+00	0.0000	4.732E-04	0.0008	0.000E+00	0.0000	8.621E-04	0.0015
Pa-231	5.027E-03	0.0090	1.498E-03	0.0027	0.000E+00	0.0000	0.000E+00	0.0000	1.522E-01	0.2710	0.000E+00	0.0000	1.390E-03	0.0025
Pb-210	6.244E-05	0.0001	5.664E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	1.028E-01	0.1830	0.000E+00	0.0000	4.048E-03	0.0072
Ra-226	1.089E-01	0.1940	9.293E-05	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	1.588E-01	0.2827	0.000E+00	0.0000	3.973E-03	0.0071
Th-230	5.082E-04	0.0009	7.025E-04	0.0013	0.000E+00	0.0000	0.000E+00	0.0000	1.571E-03	0.0028	0.000E+00	0.0000	3.685E-04	0.0007
U-234	2.989E-06	0.0000	5.260E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	8.208E-04	0.0015	0.000E+00	0.0000	8.820E-05	0.0002
U-235	5.829E-03	0.0104	4.861E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	8.147E-04	0.0015	0.000E+00	0.0000	8.417E-05	0.0001
U-238	1.250E-03	0.0022	4.576E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	7.897E-04	0.0014	0.000E+00	0.0000	8.484E-05	0.0002
Total	1.287E-01	0.2291	3.898E-03	0.0069	0.000E+00	0.0000	0.000E+00	0.0000	4.182E-01	0.7446	0.000E+00	0.0000	1.090E-02	0.0194

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.773E-03	0.0174
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.601E-01	0.2851
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.069E-01	0.1904
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.718E-01	0.4839
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.150E-03	0.0056
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.646E-04	0.0017
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.777E-03	0.0121
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.170E-03	0.0039
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.616E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 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.
Ac-227	8.849E-04	0.0019	1.749E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	5.908E-05	0.0001	0.000E+00	0.0000	1.076E-04	0.0002
Pa-231	4.119E-03	0.0087	1.091E-03	0.0023	0.000E+00	0.0000	0.000E+00	0.0000	8.476E-02	0.1781	0.000E+00	0.0000	9.319E-04	0.0020
Pb-210	3.306E-05	0.0001	2.976E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	5.400E-02	0.1135	0.000E+00	0.0000	2.127E-03	0.0045
Ra-226	1.077E-01	0.2264	1.170E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	2.027E-01	0.4259	0.000E+00	0.0000	5.742E-03	0.0121
Th-230	1.438E-03	0.0030	6.932E-04	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	3.125E-03	0.0066	0.000E+00	0.0000	4.058E-04	0.0009
U-234	1.816E-06	0.0000	2.937E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	4.571E-04	0.0010	0.000E+00	0.0000	4.914E-05	0.0001
U-235	3.270E-03	0.0069	2.747E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	4.893E-04	0.0010	0.000E+00	0.0000	4.721E-05	0.0001
U-238	7.002E-04	0.0015	2.547E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	4.396E-04	0.0009	0.000E+00	0.0000	4.722E-05	0.0001
Total	1.182E-01	0.2483	2.188E-03	0.0046	0.000E+00	0.0000	0.000E+00	0.0000	3.460E-01	0.7272	0.000E+00	0.0000	9.458E-03	0.0199

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.226E-03	0.0026
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.090E-02	0.1911
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.619E-02	0.1181
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.162E-01	0.6646
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.662E-03	0.0119
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.375E-04	0.0011
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.834E-03	0.0081
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.212E-03	0.0025
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.758E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 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.
Ac-227	6.235E-07	0.0000	1.202E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.062E-08	0.0000	0.000E+00	0.0000	7.401E-08	0.0000
Pa-231	5.912E-04	0.0016	1.495E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	1.088E-02	0.0286	0.000E+00	0.0000	1.255E-04	0.0003
Pb-210	3.572E-06	0.0000	3.128E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.675E-03	0.0149	0.000E+00	0.0000	2.235E-04	0.0006
Ra-226	1.034E-01	0.2722	1.347E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	2.353E-01	0.6194	0.000E+00	0.0000	7.162E-03	0.0189
Th-230	4.545E-03	0.0120	6.619E-04	0.0017	0.000E+00	0.0000	0.000E+00	0.0000	9.685E-03	0.0255	0.000E+00	0.0000	5.857E-04	0.0015
U-234	1.184E-06	0.0000	3.954E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.073E-05	0.0002	0.000E+00	0.0000	6.454E-06	0.0000
U-235	4.323E-04	0.0011	3.750E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.901E-05	0.0002	0.000E+00	0.0000	6.253E-06	0.0000
U-238	9.214E-05	0.0002	3.275E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.651E-05	0.0001	0.000E+00	0.0000	6.071E-06	0.0000
Total	1.091E-01	0.2871	9.604E-04	0.0025	0.000E+00	0.0000	0.000E+00	0.0000	2.617E-01	0.6890	0.000E+00	0.0000	8.115E-03	0.0214

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.584E-07	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.175E-02	0.0309
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.905E-03	0.0155
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.460E-01	0.9108
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.548E-02	0.0407
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.232E-05	0.0002
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.213E-04	0.0014
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.580E-04	0.0004
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.799E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 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.
Ac-227	6.139E-16	0.0000	1.100E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.718E-17	0.0000	0.000E+00	0.0000	6.773E-17	0.0000
Pa-231	1.795E-06	0.0000	4.219E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.069E-05	0.0001	0.000E+00	0.0000	3.540E-07	0.0000
Pb-210	6.186E-09	0.0000	4.984E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.043E-06	0.0000	0.000E+00	0.0000	3.562E-07	0.0000
Ra-226	9.167E-02	0.2707	1.149E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	2.010E-01	0.5934	0.000E+00	0.0000	6.159E-03	0.0182
Th-230	1.220E-02	0.0360	5.779E-04	0.0017	0.000E+00	0.0000	0.000E+00	0.0000	2.590E-02	0.0765	0.000E+00	0.0000	1.041E-03	0.0031
U-234	3.404E-06	0.0000	1.921E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.363E-06	0.0000	0.000E+00	0.0000	3.163E-07	0.0000
U-235	1.331E-06	0.0000	1.241E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.540E-07	0.0000	0.000E+00	0.0000	1.921E-08	0.0000
U-238	2.802E-07	0.0000	9.300E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.608E-07	0.0000	0.000E+00	0.0000	1.723E-08	0.0000
Total	1.039E-01	0.3067	6.935E-04	0.0020	0.000E+00	0.0000	0.000E+00	0.0000	2.269E-01	0.6700	0.000E+00	0.0000	7.201E-03	0.0213

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.719E-10	0.0000	0.000E+00	0.0000	8.719E-10	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.749E-07	0.0000	0.000E+00	0.0000	3.364E-05	0.0001
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.410E-06	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.989E-01	0.8826
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.972E-02	0.1173
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.128E-05	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.302E-09	0.0000	0.000E+00	0.0000	1.718E-06	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.675E-07	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.771E-07	0.0000	0.000E+00	0.0000	3.387E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser
File : C:\USERS\H5TDERJC\DESKTOP\NFSS\02 - VPH\13 - RISK ASSESSMENT\04 - RESRAD\FINAL\ADOLESCENT TR SURFACE SOIL.RAD

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pa-231	2.642E-15	0.0000	4.651E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.383E-14	0.0000	0.000E+00	0.0000	3.902E-16	0.0000
Pb-210	1.316E-18	0.0000	7.444E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.351E-15	0.0000	0.000E+00	0.0000	5.320E-17	0.0000
Ra-226	5.693E-02	0.2444	5.634E-05	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	9.851E-02	0.4229	0.000E+00	0.0000	3.019E-03	0.0130
Th-230	2.650E-02	0.1138	3.304E-04	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	4.539E-02	0.1949	0.000E+00	0.0000	1.525E-03	0.0065
U-234	8.076E-06	0.0000	1.038E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.383E-05	0.0001	0.000E+00	0.0000	4.659E-07	0.0000
U-235	2.075E-15	0.0000	2.082E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.008E-16	0.0000	0.000E+00	0.0000	2.732E-17	0.0000
U-238	7.741E-10	0.0000	1.028E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.325E-09	0.0000	0.000E+00	0.0000	4.479E-11	0.0000
Total	8.344E-02	0.3582	3.868E-04	0.0017	0.000E+00	0.0000	0.000E+00	0.0000	1.439E-01	0.6178	0.000E+00	0.0000	4.544E-03	0.0195

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.295E-04	0.0027	0.000E+00	0.0000	6.295E-04	0.0027
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.406E-15	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.585E-01	0.6805
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.374E-02	0.3166
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.945E-06	0.0000	0.000E+00	0.0000	2.642E-05	0.0001
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.722E-05	0.0001	0.000E+00	0.0000	1.722E-05	0.0001
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.814E-06	0.0000	0.000E+00	0.0000	3.816E-06	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.545E-04	0.0028	0.000E+00	0.0000	2.329E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser
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Dose/Source Ratios Summed Over All Pathways
Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g) 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-227+D	Ac-227+D	1.000E+00	2.759E-02	2.487E-02	2.021E-02	9.773E-03	1.226E-03	8.584E-07	8.719E-10	1.583E-31
Pa-231	Pa-231	1.000E+00	2.073E-01	2.013E-01	1.899E-01	1.546E-01	8.603E-02	1.104E-02	3.118E-05	6.152E-04
Pa-231	Ac-227+D	1.000E+00	1.126E-03	1.930E-03	3.208E-03	5.478E-03	4.867E-03	7.032E-04	2.463E-06	1.427E-05
Pa-231	äDSR(j)		2.084E-01	2.033E-01	1.931E-01	1.601E-01	9.090E-02	1.175E-02	3.364E-05	6.295E-04
Pb-210+D	Pb-210+D	1.000E+00	1.475E-01	1.428E-01	1.339E-01	1.069E-01	5.619E-02	5.905E-03	9.410E-06	1.406E-15
Ra-226+D	Ra-226+D	1.000E+00	2.319E-01	2.317E-01	2.314E-01	2.302E-01	2.269E-01	2.154E-01	1.851E-01	1.027E-01
Ra-226+D	Pb-210+D	1.000E+00	2.530E-03	7.043E-03	1.562E-02	4.154E-02	8.937E-02	1.306E-01	1.138E-01	5.582E-02
Ra-226+D	äDSR(j)		2.344E-01	2.388E-01	2.470E-01	2.718E-01	3.162E-01	3.460E-01	2.989E-01	1.585E-01
Th-230	Th-230	1.000E+00	2.019E-03	2.018E-03	2.015E-03	2.004E-03	1.975E-03	1.876E-03	1.610E-03	8.728E-04
Th-230	Ra-226+D	1.000E+00	4.760E-05	1.479E-04	3.483E-04	1.045E-03	3.001E-03	9.441E-03	2.461E-02	4.778E-02
Th-230	Pb-210+D	1.000E+00	3.757E-07	2.455E-06	1.231E-05	1.003E-04	6.853E-04	4.161E-03	1.350E-02	2.509E-02
Th-230	äDSR(j)		2.067E-03	2.168E-03	2.375E-03	3.150E-03	5.662E-03	1.548E-02	3.972E-02	7.374E-02
U-234	U-234	1.000E+00	1.293E-03	1.255E-03	1.184E-03	9.644E-04	5.367E-04	6.898E-05	1.954E-07	3.941E-06
U-234	Th-230	1.000E+00	1.013E-08	2.777E-08	6.144E-08	1.645E-07	3.625E-07	5.576E-07	5.072E-07	2.752E-07
U-234	Ra-226+D	1.000E+00	1.384E-10	1.004E-09	5.303E-09	4.475E-08	3.145E-07	2.000E-06	6.865E-06	1.456E-05
U-234	Pb-210+D	1.000E+00	8.629E-13	1.199E-11	1.304E-10	3.028E-09	5.455E-08	7.866E-07	3.709E-06	7.640E-06
U-234	äDSR(j)		1.293E-03	1.255E-03	1.184E-03	9.646E-04	5.375E-04	7.232E-05	1.128E-05	2.642E-05
U-235+D	U-235+D	1.000E+00	9.008E-03	8.751E-03	8.258E-03	6.742E-03	3.776E-03	4.965E-04	1.505E-06	3.761E-06
U-235+D	Pa-231	1.000E+00	1.966E-06	6.164E-06	1.385E-05	3.419E-05	5.544E-05	2.350E-05	1.988E-07	1.316E-05
U-235+D	Ac-227+D	1.000E+00	9.713E-09	4.166E-08	1.464E-07	7.373E-07	2.182E-06	1.309E-06	1.406E-08	2.973E-07
U-235+D	äDSR(j)		9.010E-03	8.757E-03	8.272E-03	6.777E-03	3.834E-03	5.213E-04	1.718E-06	1.722E-05
U-238	U-238	5.400E-05	6.292E-08	6.111E-08	5.763E-08	4.695E-08	2.613E-08	3.358E-09	9.514E-12	1.932E-10
U-238+D	U-238+D	9.999E-01	2.903E-03	2.820E-03	2.660E-03	2.170E-03	1.212E-03	1.580E-04	4.664E-07	3.802E-06
U-238+D	U-234	9.999E-01	1.823E-09	5.330E-09	1.174E-08	2.870E-08	4.640E-08	1.965E-08	1.665E-10	1.119E-08
U-238+D	Th-230	9.999E-01	1.000E-14	6.292E-14	3.068E-13	2.341E-12	1.345E-11	4.581E-11	5.025E-11	2.766E-11
U-238+D	Ra-226+D	9.999E-01	9.534E-17	1.489E-15	1.735E-14	4.218E-13	7.826E-12	1.182E-10	5.928E-10	1.396E-09
U-238+D	Pb-210+D	9.999E-01	4.972E-19	1.423E-17	3.303E-16	2.203E-14	1.083E-12	4.111E-11	3.140E-10	7.381E-10
U-238+D	äDSR(j)		2.903E-03	2.820E-03	2.660E-03	2.170E-03	1.212E-03	1.580E-04	4.675E-07	3.816E-06

The DSR includes contributions from associated (half-life ó 180 days) daughters.

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser
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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
Ac-227	9.062E+02	1.005E+03	1.237E+03	2.558E+03	2.038E+04	2.912E+07	2.867E+10	*7.232E+13
Pa-231	1.199E+02	1.230E+02	1.295E+02	1.561E+02	2.750E+02	2.128E+03	7.432E+05	3.971E+04
Pb-210	1.695E+02	1.750E+02	1.866E+02	2.338E+02	4.450E+02	4.234E+03	2.657E+06	*7.634E+13
Ra-226	1.066E+02	1.047E+02	1.012E+02	9.199E+01	7.906E+01	7.226E+01	8.364E+01	1.577E+02
Th-230	1.209E+04	1.153E+04	1.053E+04	7.937E+03	4.416E+03	1.615E+03	6.294E+02	3.390E+02
U-234	1.934E+04	1.991E+04	2.111E+04	2.592E+04	4.652E+04	3.457E+05	2.217E+06	9.463E+05
U-235	2.775E+03	2.855E+03	3.022E+03	3.689E+03	6.521E+03	4.795E+04	*2.161E+06	1.452E+06
U-238	8.611E+03	8.865E+03	9.397E+03	1.152E+04	2.062E+04	1.582E+05	*3.361E+05	*3.361E+05

*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) (pCi/g)	G(i,tmin) (pCi/g)	DSR(i,tmax) (pCi/g)	G(i,tmax) (pCi/g)
Ac-227	1.000E+00	0.000E+00	2.759E-02	9.062E+02	2.759E-02	9.062E+02
Pa-231	1.000E+00	0.000E+00	2.084E-01	1.199E+02	2.084E-01	1.199E+02
Pb-210	1.000E+00	0.000E+00	1.475E-01	1.695E+02	1.475E-01	1.695E+02
Ra-226	1.000E+00	87.3 ñ 0.2	3.466E-01	7.212E+01	2.344E-01	1.066E+02
Th-230	1.000E+00	1.000E+03	7.374E-02	3.390E+02	2.067E-03	1.209E+04
U-234	1.000E+00	0.000E+00	1.293E-03	1.934E+04	1.293E-03	1.934E+04
U-235	1.000E+00	0.000E+00	9.010E-03	2.775E+03	9.010E-03	2.775E+03
U-238	1.000E+00	0.000E+00	2.903E-03	8.611E+03	2.903E-03	8.611E+03

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser
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Individual Nuclide Dose Summed Over All Pathways
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	DOSE(j,t), mrem/yr t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-227	Ac-227	1.000E+00	2.759E-02	2.487E-02	2.021E-02	9.773E-03	1.226E-03	8.584E-07	8.719E-10	0.000E+00
Ac-227	Pa-231	1.000E+00	1.126E-03	1.930E-03	3.208E-03	5.478E-03	4.867E-03	7.032E-04	2.463E-06	1.427E-05
Ac-227	U-235	1.000E+00	9.713E-09	4.166E-08	1.464E-07	7.373E-07	2.182E-06	1.309E-06	1.406E-08	2.973E-07
Ac-227	äDOSE(j)		2.871E-02	2.680E-02	2.342E-02	1.525E-02	6.096E-03	7.053E-04	2.478E-06	1.457E-05
Pa-231	Pa-231	1.000E+00	2.073E-01	2.013E-01	1.899E-01	1.546E-01	8.603E-02	1.104E-02	3.118E-05	6.152E-04
Pa-231	U-235	1.000E+00	1.966E-06	6.164E-06	1.385E-05	3.419E-05	5.544E-05	2.350E-05	1.988E-07	1.316E-05
Pa-231	äDOSE(j)		2.073E-01	2.013E-01	1.899E-01	1.547E-01	8.609E-02	1.107E-02	3.138E-05	6.284E-04
Pb-210	Pb-210	1.000E+00	1.475E-01	1.428E-01	1.339E-01	1.069E-01	5.619E-02	5.905E-03	9.410E-06	1.406E-15
Pb-210	Ra-226	1.000E+00	2.530E-03	7.043E-03	1.562E-02	4.154E-02	8.937E-02	1.306E-01	1.138E-01	5.582E-02
Pb-210	Th-230	1.000E+00	3.757E-07	2.455E-06	1.231E-05	1.003E-04	6.853E-04	4.161E-03	1.350E-02	2.509E-02
Pb-210	U-234	1.000E+00	8.629E-13	1.199E-11	1.304E-10	3.028E-09	5.455E-08	7.866E-07	3.709E-06	7.640E-06
Pb-210	U-238	9.999E-01	4.972E-19	1.423E-17	3.303E-16	2.203E-14	1.083E-12	4.111E-11	3.140E-10	7.381E-10
Pb-210	äDOSE(j)		1.500E-01	1.499E-01	1.496E-01	1.486E-01	1.462E-01	1.407E-01	1.274E-01	8.091E-02
Ra-226	Ra-226	1.000E+00	2.319E-01	2.317E-01	2.314E-01	2.302E-01	2.269E-01	2.154E-01	1.851E-01	1.027E-01
Ra-226	Th-230	1.000E+00	4.760E-05	1.479E-04	3.483E-04	1.045E-03	3.001E-03	9.441E-03	2.461E-02	4.778E-02
Ra-226	U-234	1.000E+00	1.384E-10	1.004E-09	5.303E-09	4.475E-08	3.145E-07	2.000E-06	6.865E-06	1.456E-05
Ra-226	U-238	9.999E-01	9.534E-17	1.489E-15	1.735E-14	4.218E-13	7.826E-12	1.182E-10	5.928E-10	1.396E-09
Ra-226	äDOSE(j)		2.320E-01	2.319E-01	2.318E-01	2.313E-01	2.299E-01	2.248E-01	2.097E-01	1.505E-01
Th-230	Th-230	1.000E+00	2.019E-03	2.018E-03	2.015E-03	2.004E-03	1.975E-03	1.876E-03	1.610E-03	8.728E-04
Th-230	U-234	1.000E+00	1.013E-08	2.777E-08	6.144E-08	1.645E-07	3.625E-07	5.576E-07	5.072E-07	2.752E-07
Th-230	U-238	9.999E-01	1.000E-14	6.292E-14	3.068E-13	2.341E-12	1.345E-11	4.581E-11	5.025E-11	2.766E-11
Th-230	äDOSE(j)		2.019E-03	2.018E-03	2.015E-03	2.005E-03	1.976E-03	1.876E-03	1.610E-03	8.731E-04
U-234	U-234	1.000E+00	1.293E-03	1.255E-03	1.184E-03	9.644E-04	5.367E-04	6.898E-05	1.954E-07	3.941E-06
U-234	U-238	9.999E-01	1.823E-09	5.330E-09	1.174E-08	2.870E-08	4.640E-08	1.965E-08	1.665E-10	1.119E-08
U-234	äDOSE(j)		1.293E-03	1.255E-03	1.184E-03	9.644E-04	5.368E-04	6.900E-05	1.955E-07	3.952E-06
U-235	U-235	1.000E+00	9.008E-03	8.751E-03	8.258E-03	6.742E-03	3.776E-03	4.965E-04	1.505E-06	3.761E-06
U-238	U-238	5.400E-05	6.292E-08	6.111E-08	5.763E-08	4.695E-08	2.613E-08	3.358E-09	9.514E-12	1.932E-10
U-238	U-238	9.999E-01	2.903E-03	2.820E-03	2.660E-03	2.170E-03	1.212E-03	1.580E-04	4.664E-07	3.802E-06
U-238	äDOSE(j)		2.903E-03	2.820E-03	2.661E-03	2.170E-03	1.212E-03	1.580E-04	4.664E-07	3.803E-06

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

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser
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Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-227	Ac-227	1.000E+00	1.000E+00	9.016E-01	7.328E-01	3.548E-01	4.466E-02	3.160E-05	3.155E-14	1.401E-45
Ac-227	Pa-231	1.000E+00	0.000E+00	2.980E-02	7.845E-02	1.679E-01	1.599E-01	2.363E-02	7.275E-05	1.176E-13
Ac-227	U-235	1.000E+00	0.000E+00	3.192E-07	2.583E-06	1.996E-05	6.832E-05	4.337E-05	4.425E-07	2.481E-15
Ac-227	äS(j):		1.000E+00	9.314E-01	8.113E-01	5.227E-01	2.047E-01	2.370E-02	7.319E-05	1.201E-13
Pa-231	Pa-231	1.000E+00	1.000E+00	9.715E-01	9.169E-01	7.489E-01	4.200E-01	5.547E-02	1.707E-04	2.760E-13
Pa-231	U-235	1.000E+00	0.000E+00	2.056E-05	5.820E-05	1.585E-04	2.667E-04	1.175E-04	1.087E-06	5.902E-15
Pa-231	äS(j):		1.000E+00	9.715E-01	9.170E-01	7.490E-01	4.202E-01	5.559E-02	1.718E-04	2.819E-13
Pb-210	Pb-210	1.000E+00	1.000E+00	9.687E-01	9.091E-01	7.278E-01	3.855E-01	4.170E-02	7.249E-05	1.588E-14
Pb-210	Ra-226	1.000E+00	0.000E+00	3.059E-02	8.888E-02	2.656E-01	5.962E-01	9.059E-01	8.620E-01	6.198E-01
Pb-210	Th-230	1.000E+00	0.000E+00	6.660E-06	5.867E-05	6.056E-04	4.479E-03	2.866E-02	1.020E-01	2.784E-01
Pb-210	U-234	1.000E+00	0.000E+00	1.990E-11	5.210E-10	1.736E-08	3.510E-07	5.402E-06	2.802E-05	8.474E-05
Pb-210	U-238	9.999E-01	0.000E+00	1.406E-17	1.099E-15	1.197E-13	6.851E-12	2.813E-10	2.371E-09	8.112E-09
Pb-210	äS(j):		1.000E+00	9.993E-01	9.980E-01	9.940E-01	9.862E-01	9.762E-01	9.641E-01	8.982E-01
Ra-226	Ra-226	1.000E+00	1.000E+00	9.995E-01	9.986E-01	9.953E-01	9.860E-01	9.540E-01	8.681E-01	6.241E-01
Ra-226	Th-230	1.000E+00	0.000E+00	4.330E-04	1.298E-03	4.315E-03	1.284E-02	4.162E-02	1.152E-01	2.902E-01
Ra-226	U-234	1.000E+00	0.000E+00	1.931E-09	1.704E-08	1.770E-07	1.330E-06	8.800E-06	3.214E-05	8.845E-05
Ra-226	U-238	9.999E-01	0.000E+00	1.816E-15	4.762E-14	1.595E-12	3.265E-11	5.187E-10	2.775E-09	8.479E-09
Ra-226	äS(j):		1.000E+00	1.000E+00	9.999E-01	9.996E-01	9.988E-01	9.956E-01	9.834E-01	9.144E-01
Th-230	Th-230	1.000E+00	1.000E+00	9.997E-01	9.990E-01	9.967E-01	9.901E-01	9.674E-01	9.054E-01	7.179E-01
Th-230	U-234	1.000E+00	0.000E+00	8.872E-06	2.586E-05	7.804E-05	1.796E-04	2.873E-04	2.852E-04	2.262E-04
Th-230	U-238	9.999E-01	0.000E+00	1.251E-11	1.084E-10	1.054E-09	6.558E-09	2.355E-08	2.826E-08	2.245E-08
Th-230	äS(j):		1.000E+00	9.997E-01	9.990E-01	9.968E-01	9.903E-01	9.677E-01	9.056E-01	7.181E-01
U-234	U-234	1.000E+00	1.000E+00	9.715E-01	9.170E-01	7.490E-01	4.202E-01	5.558E-02	1.717E-04	2.811E-13
U-234	U-238	9.999E-01	0.000E+00	2.754E-06	7.798E-06	2.123E-05	3.574E-05	1.576E-05	1.460E-07	7.980E-16
U-234	äS(j):		1.000E+00	9.715E-01	9.170E-01	7.490E-01	4.202E-01	5.559E-02	1.718E-04	2.819E-13
U-235	U-235	1.000E+00	1.000E+00	9.715E-01	9.170E-01	7.490E-01	4.202E-01	5.559E-02	1.718E-04	2.819E-13
U-238	U-238	5.400E-05	5.400E-05	5.246E-05	4.952E-05	4.045E-05	2.269E-05	3.002E-06	9.277E-09	1.522E-17
U-238	U-238	9.999E-01	9.999E-01	9.715E-01	9.169E-01	7.490E-01	4.202E-01	5.559E-02	1.718E-04	2.819E-13
U-238	äS(j):		1.000E+00	9.715E-01	9.170E-01	7.490E-01	4.202E-01	5.559E-02	1.718E-04	2.819E-13

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

RESCALC.EXE execution time = 2.95 seconds

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser
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Part III: Intake Quantities and Health Risk Factors

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser
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Cancer Risk Slope Factors Summary Table
Risk Library: FGR 13 Morbidity

Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-1	Ground external radiation slope factors, 1/yr per (pCi/g):			
Sf-1	Ac-227+D	1.47E-06	3.48E-10	SLPF(1,1)
Sf-1	Pa-231	1.39E-07	1.39E-07	SLPF(2,1)
Sf-1	Pb-210+D	4.21E-09	1.41E-09	SLPF(3,1)
Sf-1	Ra-226+D	8.49E-06	2.29E-08	SLPF(4,1)
Sf-1	Th-230	8.19E-10	8.19E-10	SLPF(5,1)
Sf-1	U-234	2.52E-10	2.52E-10	SLPF(6,1)
Sf-1	U-235+D	5.43E-07	5.18E-07	SLPF(7,1)
Sf-1	U-238	4.99E-11	4.99E-11	SLPF(8,1)
Sf-1	U-238+D	1.14E-07	4.99E-11	SLPF(9,1)
Sf-2	Inhalation, slope factors, 1/(pCi):			
Sf-2	Ac-227+D	2.13E-07	1.49E-07	SLPF(1,2)
Sf-2	Pa-231	7.62E-08	7.62E-08	SLPF(2,2)
Sf-2	Pb-210+D	3.08E-08	1.58E-08	SLPF(3,2)
Sf-2	Ra-226+D	2.83E-08	2.82E-08	SLPF(4,2)
Sf-2	Th-230	3.40E-08	3.40E-08	SLPF(5,2)
Sf-2	U-234	2.78E-08	2.78E-08	SLPF(6,2)
Sf-2	U-235+D	2.50E-08	2.50E-08	SLPF(7,2)
Sf-2	U-238	2.36E-08	2.36E-08	SLPF(8,2)
Sf-2	U-238+D	2.36E-08	2.36E-08	SLPF(9,2)
Sf-3	Food ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.53E-10	2.45E-10	SLPF(1,3)
Sf-3	Pa-231	2.26E-10	2.26E-10	SLPF(2,3)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF(3,3)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF(4,3)
Sf-3	Th-230	1.19E-10	1.19E-10	SLPF(5,3)
Sf-3	U-234	9.55E-11	9.55E-11	SLPF(6,3)
Sf-3	U-235+D	9.76E-11	9.44E-11	SLPF(7,3)
Sf-3	U-238	8.66E-11	8.66E-11	SLPF(8,3)
Sf-3	U-238+D	1.21E-10	8.66E-11	SLPF(9,3)
Sf-3	Water ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	4.86E-10	2.01E-10	SLPF(1,4)
Sf-3	Pa-231	1.73E-10	1.73E-10	SLPF(2,4)
Sf-3	Pb-210+D	2.66E-09	8.81E-10	SLPF(3,4)
Sf-3	Ra-226+D	3.86E-10	3.85E-10	SLPF(4,4)
Sf-3	Th-230	9.10E-11	9.10E-11	SLPF(5,4)
Sf-3	U-234	7.07E-11	7.07E-11	SLPF(6,4)
Sf-3	U-235+D	7.18E-11	6.96E-11	SLPF(7,4)
Sf-3	U-238	6.40E-11	6.40E-11	SLPF(8,4)
Sf-3	U-238+D	8.71E-11	6.40E-11	SLPF(9,4)
Sf-3	Soil ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.53E-10	2.45E-10	SLPF(1,5)
Sf-3	Pa-231	2.26E-10	2.26E-10	SLPF(2,5)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF(3,5)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF(4,5)
Sf-3	Th-230	1.19E-10	1.19E-10	SLPF(5,5)

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser
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Cancer Risk Slope Factors Summary Table (continued)
Risk Library: FGR 13 Morbidity

Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-3	U-234	9.55E-11	9.55E-11	SLPF(6,5)
Sf-3	U-235+D	9.76E-11	9.44E-11	SLPF(7,5)
Sf-3	U-238	8.66E-11	8.66E-11	SLPF(8,5)
Sf-3	U-238+D	1.21E-10	8.66E-11	SLPF(9,5)
Sf-Rn	Radon Inhalation slope factors, 1/(pCi):			
Sf-Rn	Rn-222	1.80E-12	1.80E-12	SLPFRN(1,1)
Sf-Rn	Po-218	3.70E-12	3.70E-12	SLPFRN(1,2)
Sf-Rn	Pb-214	6.20E-12	6.20E-12	SLPFRN(1,3)
Sf-Rn	Bi-214	1.50E-11	1.50E-11	SLPFRN(1,4)
Sf-Rn	Radon K factors, (mrem/WLM):			
Sf-Rn	Rn-222 Indoor	3.88E+02	3.88E+02	KFACTR(1,1)
Sf-Rn	Rn-222 Outdoor	3.88E+02	3.88E+02	KFACTR(1,2)

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

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser

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Risk Slope and Environmental Transport Factors for the Ground Pathway

Nuclide	Slope(i)*	ETFG(i,t) At Time in Years (dimensionless)							
(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
Ac-227	3.480E-10	1.155E-02	1.155E-02	1.155E-02	1.155E-02	1.154E-02	1.153E-02	1.146E-02	1.089E-02
At-218	3.570E-09	1.169E-02	1.169E-02	1.169E-02	1.169E-02	1.169E-02	1.170E-02	1.171E-02	1.176E-02
Bi-210	2.760E-09	1.155E-02	1.155E-02	1.155E-02	1.155E-02	1.155E-02	1.153E-02	1.147E-02	1.101E-02
Bi-211	1.880E-07	1.111E-02	1.111E-02	1.111E-02	1.111E-02	1.109E-02	1.104E-02	1.087E-02	9.813E-03
Bi-214	7.480E-06	1.023E-02	1.023E-02	1.022E-02	1.022E-02	1.019E-02	1.010E-02	9.828E-03	8.430E-03
Fr-223	1.400E-07	1.139E-02	1.139E-02	1.139E-02	1.139E-02	1.138E-02	1.135E-02	1.124E-02	1.049E-02
Pa-231	1.390E-07	1.121E-02	1.121E-02	1.121E-02	1.121E-02	1.119E-02	1.115E-02	1.099E-02	9.996E-03
Pa-234	8.710E-06	1.061E-02	1.061E-02	1.061E-02	1.060E-02	1.058E-02	1.051E-02	1.027E-02	8.979E-03
Pa-234m	6.870E-08	1.081E-02	1.081E-02	1.081E-02	1.080E-02	1.078E-02	1.072E-02	1.052E-02	9.432E-03
Pb-210	1.410E-09	1.180E-02	1.180E-02	1.180E-02	1.180E-02	1.181E-02	1.181E-02	1.181E-02	1.183E-02
Pb-211	2.290E-07	1.080E-02	1.080E-02	1.080E-02	1.079E-02	1.078E-02	1.071E-02	1.049E-02	9.267E-03
Pb-214	9.820E-07	1.111E-02	1.111E-02	1.111E-02	1.111E-02	1.109E-02	1.104E-02	1.087E-02	9.823E-03
Po-210	3.950E-11	1.060E-02	1.060E-02	1.059E-02	1.059E-02	1.057E-02	1.049E-02	1.025E-02	8.956E-03
Po-211	3.580E-08	1.065E-02	1.065E-02	1.065E-02	1.064E-02	1.062E-02	1.055E-02	1.032E-02	9.051E-03
Po-214	3.860E-10	1.062E-02	1.062E-02	1.062E-02	1.061E-02	1.059E-02	1.052E-02	1.028E-02	9.004E-03
Po-215	7.480E-10	1.097E-02	1.097E-02	1.097E-02	1.096E-02	1.095E-02	1.089E-02	1.069E-02	9.552E-03
Po-218	4.260E-11	1.059E-02	1.059E-02	1.059E-02	1.058E-02	1.056E-02	1.049E-02	1.024E-02	8.943E-03
Ra-223	4.340E-07	1.137E-02	1.137E-02	1.137E-02	1.137E-02	1.136E-02	1.133E-02	1.121E-02	1.039E-02
Ra-226	2.290E-08	1.139E-02	1.139E-02	1.139E-02	1.138E-02	1.137E-02	1.134E-02	1.123E-02	1.043E-02
Rn-219	2.250E-07	1.110E-02	1.110E-02	1.110E-02	1.109E-02	1.108E-02	1.103E-02	1.085E-02	9.787E-03
Rn-222	1.740E-09	1.093E-02	1.093E-02	1.092E-02	1.092E-02	1.090E-02	1.084E-02	1.064E-02	9.466E-03
Th-227	3.780E-07	1.128E-02	1.128E-02	1.128E-02	1.127E-02	1.126E-02	1.122E-02	1.109E-02	1.017E-02
Th-230	8.190E-10	1.161E-02	1.161E-02	1.161E-02	1.161E-02	1.160E-02	1.160E-02	1.157E-02	1.121E-02
Th-231	2.450E-08	1.164E-02	1.164E-02	1.164E-02	1.164E-02	1.164E-02	1.163E-02	1.161E-02	1.129E-02
Th-234	1.630E-08	1.164E-02	1.164E-02	1.164E-02	1.164E-02	1.164E-02	1.164E-02	1.163E-02	1.137E-02
Tl-207	1.520E-08	1.105E-02	1.105E-02	1.105E-02	1.105E-02	1.103E-02	1.098E-02	1.082E-02	9.871E-03
Tl-210	0.000E+00	1.053E-02	1.053E-02	1.053E-02	1.052E-02	1.049E-02	1.041E-02	1.013E-02	8.716E-03
U-234	2.520E-10	1.169E-02	1.169E-02	1.169E-02	1.168E-02	1.168E-02	1.168E-02	1.166E-02	1.139E-02
U-235	5.180E-07	1.140E-02	1.140E-02	1.140E-02	1.140E-02	1.139E-02	1.136E-02	1.125E-02	1.047E-02
U-238	4.990E-11	1.191E-02	1.191E-02	1.191E-02	1.191E-02	1.191E-02	1.191E-02	1.191E-02	1.192E-02

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

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

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.932E-03	0.000E+00	2.395E-01	0.000E+00	4.380E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.775E-01
Pa-231	1.932E-03	0.000E+00	6.949E+01	0.000E+00	4.380E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.993E+01
Pb-210	1.932E-03	0.000E+00	1.112E+01	0.000E+00	4.380E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.156E+01
Ra-226	1.932E-03	0.000E+00	2.160E+01	0.000E+00	4.380E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.204E+01
Th-230	1.932E-03	0.000E+00	1.159E+00	0.000E+00	4.380E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.597E+00
U-234	1.932E-03	0.000E+00	4.071E+00	0.000E+00	4.380E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.509E+00
U-235	1.932E-03	0.000E+00	4.071E+00	0.000E+00	4.380E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.509E+00
U-238	1.932E-03	0.000E+00	4.071E+00	0.000E+00	4.380E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.509E+00

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	8.056E-08	0.0756	2.017E-09	0.0019	0.000E+00	0.0000	1.199E-09	0.0011	0.000E+00	0.0000	1.403E-09	0.0013
Pa-231	8.584E-09	0.0081	8.099E-10	0.0008	0.000E+00	0.0000	8.655E-08	0.0812	0.000E+00	0.0000	5.447E-10	0.0005
Pb-210	2.931E-10	0.0003	3.553E-10	0.0003	0.000E+00	0.0000	2.293E-07	0.2151	0.000E+00	0.0000	9.020E-09	0.0085
Ra-226	5.260E-07	0.4934	3.272E-10	0.0003	0.000E+00	0.0000	6.663E-08	0.0625	0.000E+00	0.0000	1.351E-09	0.0013
Th-230	5.698E-11	0.0001	3.932E-10	0.0004	0.000E+00	0.0000	8.256E-10	0.0008	0.000E+00	0.0000	3.121E-10	0.0003
U-234	1.622E-11	0.0000	2.955E-10	0.0003	0.000E+00	0.0000	2.142E-09	0.0020	0.000E+00	0.0000	2.302E-10	0.0002
U-235	3.411E-08	0.0320	2.657E-10	0.0002	0.000E+00	0.0000	2.190E-09	0.0021	0.000E+00	0.0000	2.353E-10	0.0002
U-238	6.808E-09	0.0064	2.511E-10	0.0002	0.000E+00	0.0000	2.706E-09	0.0025	0.000E+00	0.0000	2.907E-10	0.0003
Total	6.564E-07	0.6157	4.715E-09	0.0044	0.000E+00	0.0000	3.916E-07	0.3673	0.000E+00	0.0000	1.339E-08	0.0126

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.518E-08	0.0799
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.649E-08	0.0905
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.390E-07	0.2242
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.943E-07	0.5574
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.588E-09	0.0015
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.684E-09	0.0025
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.680E-08	0.0345
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.006E-08	0.0094
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.066E-06	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground risk	Ground fract.	Inhalation risk	Inhalation fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	Soil risk	Soil fract.
Ac-227	7.328E-08	0.0687	1.835E-09	0.0017	0.000E+00	0.0000	0.000E+00	0.0000	7.006E-10	0.0007	0.000E+00	0.0000	1.276E-09	0.0012
Pa-231	1.585E-08	0.0149	9.918E-10	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	8.704E-08	0.0816	0.000E+00	0.0000	6.712E-10	0.0006
Pb-210	2.674E-10	0.0003	3.241E-10	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	2.089E-07	0.1959	0.000E+00	0.0000	8.228E-09	0.0077
Ra-226	5.253E-07	0.4928	3.579E-10	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	8.697E-08	0.0816	0.000E+00	0.0000	2.140E-09	0.0020
Th-230	7.395E-10	0.0007	3.936E-10	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	9.286E-10	0.0009	0.000E+00	0.0000	3.145E-10	0.0003
U-234	1.623E-11	0.0000	2.955E-10	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	2.142E-09	0.0020	0.000E+00	0.0000	2.302E-10	0.0002
U-235	3.411E-08	0.0320	2.658E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	2.196E-09	0.0021	0.000E+00	0.0000	2.353E-10	0.0002
U-238	6.808E-09	0.0064	2.511E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	2.706E-09	0.0025	0.000E+00	0.0000	2.907E-10	0.0003
Total	6.564E-07	0.6157	4.715E-09	0.0044	0.000E+00	0.0000	0.000E+00	0.0000	3.916E-07	0.3673	0.000E+00	0.0000	1.339E-08	0.0126

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

Water Dependent Pathways

Radio-Nuclide	Water risk	Water fract.	Fish risk	Fish fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	All pathways risk	All pathways fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.710E-08	0.0723
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.046E-07	0.0981
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.177E-07	0.2042
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.148E-07	0.5767
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.376E-09	0.0022
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.684E-09	0.0025
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.681E-08	0.0345
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.006E-08	0.0094
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.066E-06	1.0000

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

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

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.798E-03	0.000E+00	3.411E-01	0.000E+00	4.078E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.489E-01
Pa-231	1.876E-03	0.000E+00	6.759E+01	0.000E+00	4.254E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.802E+01
Pb-210	1.929E-03	0.000E+00	1.113E+01	0.000E+00	4.375E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.156E+01
Ra-226	1.931E-03	0.000E+00	2.159E+01	0.000E+00	4.378E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.203E+01
Th-230	1.930E-03	0.000E+00	1.158E+00	0.000E+00	4.377E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.596E+00
U-234	1.876E-03	0.000E+00	3.960E+00	0.000E+00	4.254E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.385E+00
U-235	1.876E-03	0.000E+00	3.960E+00	0.000E+00	4.254E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.385E+00
U-238	1.876E-03	0.000E+00	3.960E+00	0.000E+00	4.254E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.385E+00

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	7.532E-08	0.0713	1.885E-09	0.0018	0.000E+00	0.0000	1.141E-09	0.0011	0.000E+00	0.0000	1.311E-09	0.0012
Pa-231	8.339E-09	0.0079	7.865E-10	0.0007	0.000E+00	0.0000	8.405E-08	0.0796	0.000E+00	0.0000	5.289E-10	0.0005
Pb-210	2.929E-10	0.0003	3.549E-10	0.0003	0.000E+00	0.0000	2.291E-07	0.2170	0.000E+00	0.0000	9.010E-09	0.0085
Ra-226	5.259E-07	0.4980	3.271E-10	0.0003	0.000E+00	0.0000	6.660E-08	0.0631	0.000E+00	0.0000	1.350E-09	0.0013
Th-230	5.696E-11	0.0001	3.929E-10	0.0004	0.000E+00	0.0000	8.250E-10	0.0008	0.000E+00	0.0000	3.118E-10	0.0003
U-234	1.576E-11	0.0000	2.869E-10	0.0003	0.000E+00	0.0000	2.081E-09	0.0020	0.000E+00	0.0000	2.235E-10	0.0002
U-235	3.314E-08	0.0314	2.580E-10	0.0002	0.000E+00	0.0000	2.127E-09	0.0020	0.000E+00	0.0000	2.285E-10	0.0002
U-238	6.614E-09	0.0063	2.439E-10	0.0002	0.000E+00	0.0000	2.628E-09	0.0025	0.000E+00	0.0000	2.823E-10	0.0003
Total	6.497E-07	0.6152	4.535E-09	0.0043	0.000E+00	0.0000	3.886E-07	0.3680	0.000E+00	0.0000	1.325E-08	0.0125

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.965E-08	0.0754
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.371E-08	0.0887
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.388E-07	0.2261
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.942E-07	0.5627
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.587E-09	0.0015
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.607E-09	0.0025
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.575E-08	0.0339
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.768E-09	0.0092
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.056E-06	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	6.607E-08	0.0626	1.654E-09	0.0016	0.000E+00	0.0000	0.000E+00	0.0000	6.314E-10	0.0006	0.000E+00	0.0000	1.150E-09	0.0011
Pa-231	1.759E-08	0.0167	1.018E-09	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	8.456E-08	0.0801	0.000E+00	0.0000	6.898E-10	0.0007
Pb-210	2.590E-10	0.0002	3.139E-10	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	2.023E-07	0.1916	0.000E+00	0.0000	7.968E-09	0.0075
Ra-226	5.250E-07	0.4972	3.675E-10	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	9.329E-08	0.0883	0.000E+00	0.0000	2.390E-09	0.0023
Th-230	9.666E-10	0.0009	3.935E-10	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	9.670E-10	0.0009	0.000E+00	0.0000	3.152E-10	0.0003
U-234	1.578E-11	0.0000	2.869E-10	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	2.081E-09	0.0020	0.000E+00	0.0000	2.235E-10	0.0002
U-235	3.314E-08	0.0314	2.581E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	2.134E-09	0.0020	0.000E+00	0.0000	2.286E-10	0.0002
U-238	6.614E-09	0.0063	2.439E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	2.628E-09	0.0025	0.000E+00	0.0000	2.823E-10	0.0003
Total	6.497E-07	0.6152	4.535E-09	0.0043	0.000E+00	0.0000	0.000E+00	0.0000	3.886E-07	0.3680	0.000E+00	0.0000	1.325E-08	0.0125

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.950E-08	0.0658
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.038E-07	0.0983
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.108E-07	0.1996
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.211E-07	0.5881
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.642E-09	0.0025
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.607E-09	0.0025
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.576E-08	0.0339
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.768E-09	0.0092
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.056E-06	1.0000

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

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

	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways				
Radio-Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.565E-03	0.000E+00	3.054E-01	0.000E+00	3.549E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.603E-01
Pa-231	1.769E-03	0.000E+00	6.375E+01	0.000E+00	4.011E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.415E+01
Pb-210	1.925E-03	0.000E+00	1.110E+01	0.000E+00	4.366E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.154E+01
Ra-226	1.929E-03	0.000E+00	2.157E+01	0.000E+00	4.374E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.201E+01
Th-230	1.927E-03	0.000E+00	1.156E+00	0.000E+00	4.371E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.593E+00
U-234	1.769E-03	0.000E+00	3.734E+00	0.000E+00	4.011E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.135E+00
U-235	1.769E-03	0.000E+00	3.734E+00	0.000E+00	4.011E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.135E+00
U-238	1.769E-03	0.000E+00	3.734E+00	0.000E+00	4.011E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.135E+00

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	6.611E-08	0.0637	1.654E-09	0.0016	0.000E+00	0.0000	1.029E-09	0.0010	0.000E+00	0.0000	1.150E-09	0.0011
Pa-231	7.870E-09	0.0076	7.417E-10	0.0007	0.000E+00	0.0000	7.927E-08	0.0764	0.000E+00	0.0000	4.988E-10	0.0005
Pb-210	2.926E-10	0.0003	3.542E-10	0.0003	0.000E+00	0.0000	2.287E-07	0.2204	0.000E+00	0.0000	8.992E-09	0.0087
Ra-226	5.257E-07	0.5067	3.268E-10	0.0003	0.000E+00	0.0000	6.654E-08	0.0641	0.000E+00	0.0000	1.349E-09	0.0013
Th-230	5.692E-11	0.0001	3.923E-10	0.0004	0.000E+00	0.0000	8.238E-10	0.0008	0.000E+00	0.0000	3.114E-10	0.0003
U-234	1.487E-11	0.0000	2.706E-10	0.0003	0.000E+00	0.0000	1.962E-09	0.0019	0.000E+00	0.0000	2.108E-10	0.0002
U-235	3.127E-08	0.0301	2.434E-10	0.0002	0.000E+00	0.0000	2.006E-09	0.0019	0.000E+00	0.0000	2.155E-10	0.0002
U-238	6.242E-09	0.0060	2.300E-10	0.0002	0.000E+00	0.0000	2.478E-09	0.0024	0.000E+00	0.0000	2.662E-10	0.0003
Total	6.376E-07	0.6145	4.213E-09	0.0041	0.000E+00	0.0000	3.828E-07	0.3689	0.000E+00	0.0000	1.299E-08	0.0125

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.994E-08	0.0674
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.838E-08	0.0852
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.383E-07	0.2297
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.939E-07	0.5724
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.584E-09	0.0015
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.458E-09	0.0024
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.374E-08	0.0325
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.216E-09	0.0089
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.038E-06	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	5.370E-08	0.0518	1.343E-09	0.0013	0.000E+00	0.0000	0.000E+00	0.0000	5.128E-10	0.0005	0.000E+00	0.0000	9.343E-10	0.0009
Pa-231	2.028E-08	0.0195	1.052E-09	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	7.978E-08	0.0769	0.000E+00	0.0000	7.147E-10	0.0007
Pb-210	2.431E-10	0.0002	2.943E-10	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	1.897E-07	0.1828	0.000E+00	0.0000	7.471E-09	0.0072
Ra-226	5.244E-07	0.5054	3.858E-10	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	1.053E-07	0.1015	0.000E+00	0.0000	2.865E-09	0.0028
Th-230	1.420E-09	0.0014	3.932E-10	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	1.052E-09	0.0010	0.000E+00	0.0000	3.171E-10	0.0003
U-234	1.491E-11	0.0000	2.706E-10	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	1.962E-09	0.0019	0.000E+00	0.0000	2.108E-10	0.0002
U-235	3.127E-08	0.0301	2.435E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	2.016E-09	0.0019	0.000E+00	0.0000	2.156E-10	0.0002
U-238	6.242E-09	0.0060	2.300E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	2.478E-09	0.0024	0.000E+00	0.0000	2.662E-10	0.0003
Total	6.376E-07	0.6145	4.213E-09	0.0041	0.000E+00	0.0000	0.000E+00	0.0000	3.828E-07	0.3689	0.000E+00	0.0000	1.299E-08	0.0125

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.649E-08	0.0544
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.018E-07	0.0981
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.977E-07	0.1905
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.330E-07	0.6100
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.182E-09	0.0031
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.459E-09	0.0024
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.375E-08	0.0325
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.216E-09	0.0089
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.038E-06	1.0000

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

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

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.006E-03	0.000E+00	2.153E-01	0.000E+00	2.280E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.433E-01
Pa-231	1.441E-03	0.000E+00	5.193E+01	0.000E+00	3.268E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.225E+01
Pb-210	1.912E-03	0.000E+00	1.103E+01	0.000E+00	4.336E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.146E+01
Ra-226	1.923E-03	0.000E+00	2.151E+01	0.000E+00	4.361E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.194E+01
Th-230	1.918E-03	0.000E+00	1.150E+00	0.000E+00	4.348E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.585E+00
U-234	1.441E-03	0.000E+00	3.042E+00	0.000E+00	3.268E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.369E+00
U-235	1.441E-03	0.000E+00	3.042E+00	0.000E+00	3.268E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.369E+00
U-238	1.441E-03	0.000E+00	3.042E+00	0.000E+00	3.268E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.369E+00

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	4.373E-08	0.0443	1.091E-09	0.0011	0.000E+00	0.0000	7.404E-10	0.0008	0.000E+00	0.0000	7.590E-10	0.0008
Pa-231	6.426E-09	0.0065	6.042E-10	0.0006	0.000E+00	0.0000	6.457E-08	0.0654	0.000E+00	0.0000	4.063E-10	0.0004
Pb-210	2.915E-10	0.0003	3.519E-10	0.0004	0.000E+00	0.0000	2.272E-07	0.2302	0.000E+00	0.0000	8.934E-09	0.0091
Ra-226	5.252E-07	0.5321	3.258E-10	0.0003	0.000E+00	0.0000	6.633E-08	0.0672	0.000E+00	0.0000	1.345E-09	0.0014
Th-230	5.679E-11	0.0001	3.903E-10	0.0004	0.000E+00	0.0000	8.196E-10	0.0008	0.000E+00	0.0000	3.098E-10	0.0003
U-234	1.215E-11	0.0000	2.204E-10	0.0002	0.000E+00	0.0000	1.598E-09	0.0016	0.000E+00	0.0000	1.717E-10	0.0002
U-235	2.554E-08	0.0259	1.982E-10	0.0002	0.000E+00	0.0000	1.634E-09	0.0017	0.000E+00	0.0000	1.755E-10	0.0002
U-238	5.096E-09	0.0052	1.874E-10	0.0002	0.000E+00	0.0000	2.019E-09	0.0020	0.000E+00	0.0000	2.168E-10	0.0002
Total	6.063E-07	0.6144	3.369E-09	0.0034	0.000E+00	0.0000	3.649E-07	0.3697	0.000E+00	0.0000	1.232E-08	0.0125

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.632E-08	0.0469
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.201E-08	0.0730
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.368E-07	0.2399
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.932E-07	0.6011
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.577E-09	0.0016
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.003E-09	0.0020
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.755E-08	0.0279
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.519E-09	0.0076
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.869E-07	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground risk	Ground fract.	Inhalation risk	Inhalation fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	Soil risk	Soil fract.
Ac-227	2.599E-08	0.0263	6.484E-10	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	2.476E-10	0.0003	0.000E+00	0.0000	4.511E-10	0.0005
Pa-231	2.417E-08	0.0245	1.047E-09	0.0011	0.000E+00	0.0000	0.000E+00	0.0000	6.505E-08	0.0659	0.000E+00	0.0000	7.141E-10	0.0007
Pb-210	1.946E-10	0.0002	2.350E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	1.514E-07	0.1534	0.000E+00	0.0000	5.965E-09	0.0060
Ra-226	5.223E-07	0.5293	4.406E-10	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	1.415E-07	0.1434	0.000E+00	0.0000	4.298E-09	0.0044
Th-230	3.001E-09	0.0030	3.925E-10	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	1.422E-09	0.0014	0.000E+00	0.0000	3.264E-10	0.0003
U-234	1.231E-11	0.0000	2.205E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	1.598E-09	0.0016	0.000E+00	0.0000	1.717E-10	0.0002
U-235	2.554E-08	0.0259	1.985E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	1.652E-09	0.0017	0.000E+00	0.0000	1.757E-10	0.0002
U-238	5.096E-09	0.0052	1.874E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	2.019E-09	0.0020	0.000E+00	0.0000	2.169E-10	0.0002
Total	6.063E-07	0.6144	3.369E-09	0.0034	0.000E+00	0.0000	0.000E+00	0.0000	3.649E-07	0.3697	0.000E+00	0.0000	1.232E-08	0.0125

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

Water Dependent Pathways

Radio-Nuclide	Water risk	Water fract.	Fish risk	Fish fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	All pathways risk	All pathways fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.733E-08	0.0277
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.097E-08	0.0922
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.578E-07	0.1599
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.686E-07	0.6774
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.141E-09	0.0052
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.003E-09	0.0020
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.757E-08	0.0279
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.519E-09	0.0076
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.869E-07	1.0000

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

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 3.000E+01 years

	Water Independent Pathways (Inhalation w/o radon)				Water Dependent Pathways					
Radio-Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*	Total
Ac-227	3.906E-04	0.000E+00	9.877E-02	0.000E+00	8.857E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.873E-01	
Pa-231	8.020E-04	0.000E+00	2.890E+01	0.000E+00	1.819E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.908E+01	
Pb-210	1.882E-03	0.000E+00	1.085E+01	0.000E+00	4.268E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.128E+01	
Ra-226	1.906E-03	0.000E+00	2.132E+01	0.000E+00	4.322E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.175E+01	
Th-230	1.890E-03	0.000E+00	1.134E+00	0.000E+00	4.285E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.562E+00	
U-234	8.020E-04	0.000E+00	1.693E+00	0.000E+00	1.819E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.875E+00	
U-235	8.020E-04	0.000E+00	1.693E+00	0.000E+00	1.819E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.875E+00	
U-238	8.020E-04	0.000E+00	1.693E+00	0.000E+00	1.819E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.875E+00	

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

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 3.000E+01 years

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

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

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.803E-08	0.0199	4.466E-10	0.0005	0.000E+00	0.0000	3.507E-10	0.0004	0.000E+00	0.0000	3.107E-10	0.0003
Pa-231	3.601E-09	0.0040	3.362E-10	0.0004	0.000E+00	0.0000	3.594E-08	0.0397	0.000E+00	0.0000	2.261E-10	0.0002
Pb-210	2.893E-10	0.0003	3.466E-10	0.0004	0.000E+00	0.0000	2.237E-07	0.2470	0.000E+00	0.0000	8.798E-09	0.0097
Ra-226	5.236E-07	0.5781	3.229E-10	0.0004	0.000E+00	0.0000	6.575E-08	0.0726	0.000E+00	0.0000	1.333E-09	0.0015
Th-230	5.642E-11	0.0001	3.847E-10	0.0004	0.000E+00	0.0000	8.077E-10	0.0009	0.000E+00	0.0000	3.053E-10	0.0003
U-234	6.816E-12	0.0000	1.227E-10	0.0001	0.000E+00	0.0000	8.895E-10	0.0010	0.000E+00	0.0000	9.556E-11	0.0001
U-235	1.432E-08	0.0158	1.103E-10	0.0001	0.000E+00	0.0000	9.095E-10	0.0010	0.000E+00	0.0000	9.770E-11	0.0001
U-238	2.855E-09	0.0032	1.043E-10	0.0001	0.000E+00	0.0000	1.123E-09	0.0012	0.000E+00	0.0000	1.207E-10	0.0001
Total	5.627E-07	0.6213	2.174E-09	0.0024	0.000E+00	0.0000	3.295E-07	0.3638	0.000E+00	0.0000	1.129E-08	0.0125

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.913E-08	0.0211
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.010E-08	0.0443
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.332E-07	0.2574
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.910E-07	0.6525
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.554E-09	0.0017
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.115E-09	0.0012
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.544E-08	0.0170
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.204E-09	0.0046
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.057E-07	1.0000

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

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+01 years

Radionuclides

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

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

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground risk	Ground fract.	Inhalation risk	Inhalation fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	Soil risk	Soil fract.
Ac-227	3.267E-09	0.0036	8.096E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	3.091E-11	0.0000	0.000E+00	0.0000	5.632E-11	0.0001
Pa-231	1.835E-08	0.0203	7.015E-10	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	3.623E-08	0.0400	0.000E+00	0.0000	4.802E-10	0.0005
Pb-210	1.030E-10	0.0001	1.235E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	7.956E-08	0.0878	0.000E+00	0.0000	3.134E-09	0.0035
Ra-226	5.164E-07	0.5701	5.396E-10	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	2.078E-07	0.2294	0.000E+00	0.0000	6.932E-09	0.0077
Th-230	7.454E-09	0.0082	3.910E-10	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	2.936E-09	0.0032	0.000E+00	0.0000	3.712E-10	0.0004
U-234	7.650E-12	0.0000	1.227E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	8.898E-10	0.0010	0.000E+00	0.0000	9.561E-11	0.0001
U-235	1.433E-08	0.0158	1.107E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	9.346E-10	0.0010	0.000E+00	0.0000	9.798E-11	0.0001
U-238	2.855E-09	0.0032	1.043E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	1.124E-09	0.0012	0.000E+00	0.0000	1.207E-10	0.0001
Total	5.627E-07	0.6213	2.174E-09	0.0024	0.000E+00	0.0000	0.000E+00	0.0000	3.295E-07	0.3638	0.000E+00	0.0000	1.129E-08	0.0125

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

Water Dependent Pathways

Radio-Nuclide	Water risk	Water fract.	Fish risk	Fish fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	All pathways risk	All pathways fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.436E-09	0.0038
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.576E-08	0.0616
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.292E-08	0.0916
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.316E-07	0.8078
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.115E-08	0.0123
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.116E-09	0.0012
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.547E-08	0.0171
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.204E-09	0.0046
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.057E-07	1.0000

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

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

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*	Total
Ac-227	4.395E-05	0.000E+00	1.192E-02	0.000E+00	9.966E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.188E-02
Pa-231	1.031E-04	0.000E+00	3.715E+00	0.000E+00	2.338E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.738E+00
Pb-210	1.810E-03	0.000E+00	1.044E+01	0.000E+00	4.105E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.085E+01
Ra-226	1.846E-03	0.000E+00	2.065E+01	0.000E+00	4.186E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.106E+01
Th-230	1.794E-03	0.000E+00	1.077E+00	0.000E+00	4.069E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.483E+00
U-234	1.031E-04	0.000E+00	2.176E-01	0.000E+00	2.338E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.410E-01
U-235	1.031E-04	0.000E+00	2.176E-01	0.000E+00	2.338E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.410E-01
U-238	1.031E-04	0.000E+00	2.176E-01	0.000E+00	2.338E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.410E-01

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.129E-09	0.0026	5.146E-11	0.0001	0.000E+00	0.0000	4.281E-11	0.0001	0.000E+00	0.0000	3.580E-11	0.0000
Pa-231	4.744E-10	0.0006	4.322E-11	0.0001	0.000E+00	0.0000	4.619E-09	0.0056	0.000E+00	0.0000	2.907E-11	0.0000
Pb-210	2.862E-10	0.0003	3.335E-10	0.0004	0.000E+00	0.0000	2.153E-07	0.2629	0.000E+00	0.0000	8.467E-09	0.0103
Ra-226	5.177E-07	0.6321	3.127E-10	0.0004	0.000E+00	0.0000	6.367E-08	0.0777	0.000E+00	0.0000	1.291E-09	0.0016
Th-230	5.510E-11	0.0001	3.652E-10	0.0004	0.000E+00	0.0000	7.669E-10	0.0009	0.000E+00	0.0000	2.899E-10	0.0004
U-234	9.014E-13	0.0000	1.577E-11	0.0000	0.000E+00	0.0000	1.143E-10	0.0001	0.000E+00	0.0000	1.228E-11	0.0000
U-235	1.889E-09	0.0023	1.418E-11	0.0000	0.000E+00	0.0000	1.169E-10	0.0001	0.000E+00	0.0000	1.256E-11	0.0000
U-238	3.757E-10	0.0005	1.340E-11	0.0000	0.000E+00	0.0000	1.444E-10	0.0002	0.000E+00	0.0000	1.551E-11	0.0000
Total	5.229E-07	0.6385	1.150E-09	0.0014	0.000E+00	0.0000	2.848E-07	0.3477	0.000E+00	0.0000	1.015E-08	0.0124

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.259E-09	0.0028
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.166E-09	0.0063
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.244E-07	0.2740
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.830E-07	0.7118
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.477E-09	0.0018
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.433E-10	0.0002
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.033E-09	0.0025
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.490E-10	0.0007
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.190E-07	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground risk	Ground fract.	Inhalation risk	Inhalation fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	Soil risk	Soil fract.
Ac-227	2.302E-12	0.0000	5.566E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.125E-14	0.0000	0.000E+00	0.0000	3.872E-14	0.0000
Pa-231	2.596E-09	0.0032	9.443E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	4.652E-09	0.0057	0.000E+00	0.0000	6.469E-11	0.0001
Pb-210	1.113E-11	0.0000	1.297E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.361E-09	0.0102	0.000E+00	0.0000	3.293E-10	0.0004
Ra-226	4.957E-07	0.6052	6.096E-10	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	2.613E-07	0.3191	0.000E+00	0.0000	9.115E-09	0.0111
Th-230	2.233E-08	0.0273	3.888E-10	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	1.008E-08	0.0123	0.000E+00	0.0000	6.039E-10	0.0007
U-234	5.684E-12	0.0000	1.588E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.164E-10	0.0001	0.000E+00	0.0000	1.243E-11	0.0000
U-235	1.894E-09	0.0023	1.437E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.270E-10	0.0002	0.000E+00	0.0000	1.269E-11	0.0000
U-238	3.757E-10	0.0005	1.341E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.444E-10	0.0002	0.000E+00	0.0000	1.552E-11	0.0000
Total	5.229E-07	0.6385	1.150E-09	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	2.848E-07	0.3477	0.000E+00	0.0000	1.015E-08	0.0124

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

Water Dependent Pathways

Radio-Nuclide	Water risk	Water fract.	Fish risk	Fish fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	All pathways risk	All pathways fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.418E-12	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.407E-09	0.0090
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.714E-09	0.0106
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.667E-07	0.9362
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.341E-08	0.0408
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.504E-10	0.0002
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.048E-09	0.0025
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.491E-10	0.0007
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.190E-07	1.0000

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

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

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.244E-07	0.000E+00	3.375E-05	0.000E+00	2.821E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.367E-05	0.000E+00	1.256E-04
Pa-231	2.920E-07	0.000E+00	1.052E-02	0.000E+00	6.622E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.059E-02
Pb-210	1.639E-03	0.000E+00	9.449E+00	0.000E+00	3.716E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.821E+00
Ra-226	1.672E-03	0.000E+00	1.869E+01	0.000E+00	3.790E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.907E+01
Th-230	1.539E-03	0.000E+00	9.235E-01	0.000E+00	3.491E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.273E+00
U-234	2.920E-07	0.000E+00	6.164E-04	0.000E+00	6.622E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.826E-04
U-235	2.920E-07	0.000E+00	6.164E-04	0.000E+00	6.622E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.826E-04
U-238	2.920E-07	0.000E+00	6.164E-04	0.000E+00	6.622E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.826E-04

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	6.484E-12	0.0000	1.457E-13	0.0000	0.000E+00	0.0000	1.212E-13	0.0000	0.000E+00	0.0000	1.013E-13	0.0000
Pa-231	1.446E-12	0.0000	1.224E-13	0.0000	0.000E+00	0.0000	1.308E-11	0.0000	0.000E+00	0.0000	8.233E-14	0.0000
Pb-210	2.817E-10	0.0004	3.019E-10	0.0004	0.000E+00	0.0000	1.949E-07	0.2559	0.000E+00	0.0000	7.665E-09	0.0101
Ra-226	4.980E-07	0.6540	2.831E-10	0.0004	0.000E+00	0.0000	5.764E-08	0.0757	0.000E+00	0.0000	1.169E-09	0.0015
Th-230	5.144E-11	0.0001	3.133E-10	0.0004	0.000E+00	0.0000	6.578E-10	0.0009	0.000E+00	0.0000	2.486E-10	0.0003
U-234	2.781E-15	0.0000	4.466E-14	0.0000	0.000E+00	0.0000	3.239E-13	0.0000	0.000E+00	0.0000	3.479E-14	0.0000
U-235	5.785E-12	0.0000	4.017E-14	0.0000	0.000E+00	0.0000	3.311E-13	0.0000	0.000E+00	0.0000	3.557E-14	0.0000
U-238	1.141E-12	0.0000	3.796E-14	0.0000	0.000E+00	0.0000	4.090E-13	0.0000	0.000E+00	0.0000	4.394E-14	0.0000
Total	4.984E-07	0.6544	8.987E-10	0.0012	0.000E+00	0.0000	2.532E-07	0.3325	0.000E+00	0.0000	9.082E-09	0.0119

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.645E-13	0.0000	0.000E+00	0.0000	7.116E-12	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.473E-11	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.031E-07	0.2667
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.571E-07	0.7316
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.271E-09	0.0017
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.061E-13	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.192E-12	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.632E-12	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.645E-13	0.0000	0.000E+00	0.0000	7.616E-07	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.267E-21	0.0000	5.094E-23	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.945E-23	0.0000	0.000E+00	0.0000	3.543E-23	0.0000
Pa-231	7.880E-12	0.0000	2.664E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.312E-11	0.0000	0.000E+00	0.0000	1.825E-13	0.0000
Pb-210	1.929E-14	0.0000	2.067E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.332E-11	0.0000	0.000E+00	0.0000	5.248E-13	0.0000
Ra-226	4.394E-07	0.5770	5.192E-10	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	2.249E-07	0.2953	0.000E+00	0.0000	7.875E-09	0.0103
Th-230	5.897E-08	0.0774	3.789E-10	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	2.831E-08	0.0372	0.000E+00	0.0000	1.206E-09	0.0016
U-234	1.647E-11	0.0000	1.615E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.166E-12	0.0000	0.000E+00	0.0000	3.770E-13	0.0000
U-235	5.834E-12	0.0000	4.184E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.154E-13	0.0000	0.000E+00	0.0000	3.671E-14	0.0000
U-238	1.143E-12	0.0000	3.801E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.100E-13	0.0000	0.000E+00	0.0000	4.400E-14	0.0000
Total	4.984E-07	0.6544	8.987E-10	0.0012	0.000E+00	0.0000	0.000E+00	0.0000	2.532E-07	0.3325	0.000E+00	0.0000	9.082E-09	0.0119

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.387E-16	0.0000	0.000E+00	0.0000	5.387E-16	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.630E-13	0.0000	0.000E+00	0.0000	2.171E-11	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.389E-11	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.727E-07	0.8832
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.886E-08	0.1167
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.518E-11	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.364E-16	0.0000	0.000E+00	0.0000	6.329E-12	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.635E-12	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.645E-13	0.0000	0.000E+00	0.0000	7.616E-07	1.0000

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

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.000E+03 years

	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways				
Radio-Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.392E-16	0.000E+00	3.776E-14	0.000E+00	3.156E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.484E-03	0.000E+00	2.484E-03
Pa-231	3.267E-16	0.000E+00	1.177E-11	0.000E+00	7.408E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.123E-01	0.000E+00	2.123E-01
Pb-210	1.041E-03	0.000E+00	6.002E+00	0.000E+00	2.360E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.757E-07	0.000E+00	6.238E+00
Ra-226	1.060E-03	0.000E+00	1.185E+01	0.000E+00	2.403E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.180E-08	0.000E+00	1.209E+01
Th-230	8.323E-04	0.000E+00	4.993E-01	0.000E+00	1.887E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.040E-07	0.000E+00	6.880E-01
U-234	3.267E-16	0.000E+00	6.896E-13	0.000E+00	7.408E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.443E-02	0.000E+00	1.443E-02
U-235	3.267E-16	0.000E+00	6.896E-13	0.000E+00	7.408E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.443E-02	0.000E+00	1.443E-02
U-238	3.267E-16	0.000E+00	6.896E-13	0.000E+00	7.408E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.443E-02	0.000E+00	1.443E-02

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	9.687E-21	0.0000	1.629E-22	0.0000	0.000E+00	0.0000	1.355E-22	0.0000	0.000E+00	0.0000	1.133E-22	0.0000
Pa-231	2.156E-21	0.0000	1.369E-22	0.0000	0.000E+00	0.0000	1.463E-20	0.0000	0.000E+00	0.0000	9.205E-23	0.0000
Pb-210	2.555E-10	0.0005	1.916E-10	0.0003	0.000E+00	0.0000	1.237E-07	0.2181	0.000E+00	0.0000	4.865E-09	0.0086
Ra-226	3.998E-07	0.7048	1.793E-10	0.0003	0.000E+00	0.0000	3.652E-08	0.0644	0.000E+00	0.0000	7.404E-10	0.0013
Th-230	3.951E-11	0.0001	1.693E-10	0.0003	0.000E+00	0.0000	3.554E-10	0.0006	0.000E+00	0.0000	1.343E-10	0.0002
U-234	4.455E-24	0.0000	4.994E-23	0.0000	0.000E+00	0.0000	3.621E-22	0.0000	0.000E+00	0.0000	3.890E-23	0.0000
U-235	8.843E-21	0.0000	4.491E-23	0.0000	0.000E+00	0.0000	3.702E-22	0.0000	0.000E+00	0.0000	3.977E-23	0.0000
U-238	1.692E-21	0.0000	4.245E-23	0.0000	0.000E+00	0.0000	4.573E-22	0.0000	0.000E+00	0.0000	4.913E-23	0.0000
Total	4.001E-07	0.7053	5.402E-10	0.0010	0.000E+00	0.0000	1.606E-07	0.2831	0.000E+00	0.0000	5.739E-09	0.0101

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.732E-12	0.0000	0.000E+00	0.0000	9.732E-12	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.879E-10	0.0005	0.000E+00	0.0000	2.879E-10	0.0005
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.766E-15	0.0000	0.000E+00	0.0000	1.290E-07	0.2274
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.810E-17	0.0000	0.000E+00	0.0000	4.372E-07	0.7708
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.465E-16	0.0000	0.000E+00	0.0000	6.986E-10	0.0012
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.271E-12	0.0000	0.000E+00	0.0000	8.271E-12	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.456E-12	0.0000	0.000E+00	0.0000	8.456E-12	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.045E-11	0.0000	0.000E+00	0.0000	1.045E-11	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.248E-10	0.0006	0.000E+00	0.0000	5.672E-07	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adolescent Trespasser
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pa-231	1.160E-20	0.0000	2.935E-22	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.445E-20	0.0000	0.000E+00	0.0000	2.011E-22	0.0000
Pb-210	4.114E-24	0.0000	3.086E-24	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.989E-21	0.0000	0.000E+00	0.0000	7.834E-23	0.0000
Ra-226	2.728E-07	0.4808	2.544E-10	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	1.102E-07	0.1942	0.000E+00	0.0000	3.858E-09	0.0068
Th-230	1.273E-07	0.2244	2.858E-10	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	5.039E-08	0.0888	0.000E+00	0.0000	1.881E-09	0.0033
U-234	3.879E-11	0.0001	8.883E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.535E-11	0.0000	0.000E+00	0.0000	5.741E-13	0.0000
U-235	9.089E-21	0.0000	5.116E-23	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.802E-22	0.0000	0.000E+00	0.0000	4.405E-23	0.0000
U-238	3.719E-15	0.0000	8.693E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.471E-15	0.0000	0.000E+00	0.0000	5.513E-17	0.0000
Total	4.001E-07	0.7053	5.402E-10	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	1.606E-07	0.2831	0.000E+00	0.0000	5.739E-09	0.0101

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.914E-10	0.0005	0.000E+00	0.0000	2.914E-10	0.0005
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.074E-21	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.870E-07	0.6823
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.798E-07	0.3170
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.253E-12	0.0000	0.000E+00	0.0000	6.306E-11	0.0001
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.470E-11	0.0000	0.000E+00	0.0000	1.470E-11	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.047E-11	0.0000	0.000E+00	0.0000	1.047E-11	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.248E-10	0.0006	0.000E+00	0.0000	5.672E-07	1.0000

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

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser
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Part I: Mixture Sums and Single Radionuclide Guidelines

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser
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Dose Conversion Factor (and Related) Parameter Summary
Dose Library: ICRP 72 (Age 15)

Menu	Parameter	Current Value#	Base Case*	Parameter Name
A-1	DCF's for external ground radiation, (mrem/yr)/(pCi/g)			
A-1	Ac-227 (Source: ICRP 60)	4.485E-04	4.485E-04	DCF1(1)
A-1	At-218 (Source: ICRP 60)	4.878E-03	4.878E-03	DCF1(2)
A-1	Bi-210 (Source: ICRP 60)	5.476E-03	5.476E-03	DCF1(3)
A-1	Bi-211 (Source: ICRP 60)	2.373E-01	2.373E-01	DCF1(4)
A-1	Bi-214 (Source: ICRP 60)	9.325E+00	9.325E+00	DCF1(5)
A-1	Fr-223 (Source: ICRP 60)	1.813E-01	1.813E-01	DCF1(6)
A-1	Pa-231 (Source: ICRP 60)	1.762E-01	1.762E-01	DCF1(7)
A-1	Pa-234 (Source: ICRP 60)	1.088E+01	1.088E+01	DCF1(8)
A-1	Pa-234m (Source: ICRP 60)	9.867E-02	9.867E-02	DCF1(9)
A-1	Pb-210 (Source: ICRP 60)	1.981E-03	1.981E-03	DCF1(10)
A-1	Pb-211 (Source: ICRP 60)	2.915E-01	2.915E-01	DCF1(11)
A-1	Pb-214 (Source: ICRP 60)	1.243E+00	1.243E+00	DCF1(12)
A-1	Po-210 (Source: ICRP 60)	4.934E-05	4.934E-05	DCF1(13)
A-1	Po-211 (Source: ICRP 60)	4.485E-02	4.485E-02	DCF1(14)
A-1	Po-214 (Source: ICRP 60)	4.840E-04	4.840E-04	DCF1(15)
A-1	Po-215 (Source: ICRP 60)	9.456E-04	9.456E-04	DCF1(16)
A-1	Po-218 (Source: ICRP 60)	5.326E-05	5.326E-05	DCF1(17)
A-1	Ra-223 (Source: ICRP 60)	5.532E-01	5.532E-01	DCF1(18)
A-1	Ra-226 (Source: ICRP 60)	2.915E-02	2.915E-02	DCF1(19)
A-1	Rn-219 (Source: ICRP 60)	2.859E-01	2.859E-01	DCF1(20)
A-1	Rn-222 (Source: ICRP 60)	2.186E-03	2.186E-03	DCF1(21)
A-1	Th-227 (Source: ICRP 60)	4.803E-01	4.803E-01	DCF1(22)
A-1	Th-230 (Source: ICRP 60)	1.071E-03	1.071E-03	DCF1(23)
A-1	Th-231 (Source: ICRP 60)	3.214E-02	3.214E-02	DCF1(24)
A-1	Th-234 (Source: ICRP 60)	2.130E-02	2.130E-02	DCF1(25)
A-1	Tl-207 (Source: ICRP 60)	2.299E-02	2.299E-02	DCF1(26)
A-1	Tl-210 (Source: ICRP 60)	1.661E+01	1.661E+01	DCF1(27)
A-1	U-234 (Source: ICRP 60)	3.439E-04	3.439E-04	DCF1(28)
A-1	U-235 (Source: ICRP 60)	6.597E-01	6.597E-01	DCF1(29)
A-1	U-238 (Source: ICRP 60)	7.961E-05	7.961E-05	DCF1(30)
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	2.160E+00	2.072E+00	DCF2(1)
B-1	Pa-231	5.550E-01	5.550E-01	DCF2(2)
B-1	Pb-210+D	4.111E-02	2.183E-02	DCF2(3)
B-1	Ra-226+D	3.712E-02	3.700E-02	DCF2(4)
B-1	Th-230	3.663E-01	3.663E-01	DCF2(5)
B-1	U-234	3.700E-02	3.700E-02	DCF2(6)
B-1	U-235+D	3.404E-02	3.404E-02	DCF2(7)
B-1	U-238	3.219E-02	3.219E-02	DCF2(8)
B-1	U-238+D	3.222E-02	3.219E-02	DCF2(9)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	5.865E-03	4.440E-03	DCF3(1)
D-1	Pa-231	2.960E-03	2.960E-03	DCF3(2)
D-1	Pb-210+D	1.296E-02	7.030E-03	DCF3(3)
D-1	Ra-226+D	5.551E-03	5.550E-03	DCF3(4)
D-1	Th-230	8.140E-04	8.140E-04	DCF3(5)
D-1	U-234	2.738E-04	2.738E-04	DCF3(6)

Dose Conversion Factor (and Related) Parameter Summary (continued)
Dose Library: ICRP 72 (Age 15)

Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-1	U-235+D	2.606E-04	2.590E-04	DCF3(7)
D-1	U-238	2.479E-04	2.479E-04	DCF3(8)
D-1	U-238+D	2.634E-04	2.479E-04	DCF3(9)
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	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(2,1)
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(2,2)
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(2,3)
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(3,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(3,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(3,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(4,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(4,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(4,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(5,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(5,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(5,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(6,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(6,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(6,3)
D-34				
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(7,1)
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(7,2)
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(7,3)
D-34				
D-34	U-238 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(8,1)
D-34	U-238 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(8,2)
D-34	U-238 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(8,3)
D-34				
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(9,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(9,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(9,3)
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	Pa-231 , fish	1.000E+01	1.000E+01	BIOFAC(2,1)
D-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(2,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(3,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(3,2)

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser
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Dose Conversion Factor (and Related) Parameter Summary (continued)

Dose Library: ICRP 72 (Age 15)

Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(4,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(4,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(5,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(5,2)
D-5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(6,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(6,2)
D-5				
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIOFAC(7,1)
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(7,2)
D-5				
D-5	U-238 , fish	1.000E+01	1.000E+01	BIOFAC(8,1)
D-5	U-238 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(8,2)
D-5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(9,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(9,2)

#For DCF1(xxx) only, factors are for infinite depth & area. See ETFG table in Ground Pathway of Detailed Report.

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

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser
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Site-Specific Parameter Summary

Menu	Parameter	User Input	Used by RESRAD Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.620E+04	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	1.370E+00	2.000E+00	---	THICK0
R011	Fraction of contamination that is submerged	0.000E+00	0.000E+00	---	SUBMFRACT
R011	Length parallel to aquifer flow (m)	1.000E+02	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Ac-227	1.000E+00	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g): Pa-231	1.000E+00	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Pb-210	1.000E+00	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): Ra-226	1.000E+00	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Th-230	1.000E+00	0.000E+00	---	S1(5)
R012	Initial principal radionuclide (pCi/g): U-234	1.000E+00	0.000E+00	---	S1(6)
R012	Initial principal radionuclide (pCi/g): U-235	1.000E+00	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): U-238	1.000E+00	0.000E+00	---	S1(8)
R012	Concentration in groundwater (pCi/L): Ac-227	not used	0.000E+00	---	W1(1)
R012	Concentration in groundwater (pCi/L): Pa-231	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Pb-210	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	W1(4)
R012	Concentration in groundwater (pCi/L): Th-230	not used	0.000E+00	---	W1(5)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(6)
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	---	W1(7)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(8)
R013	Cover depth (m)	1.500E-01	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	1.700E+00	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	6.000E-05	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.700E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	6.000E-05	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.200E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	3.600E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	6.840E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	1.040E+01	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	4.400E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	9.000E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	4.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.000E+06	1.000E+06	---	WAREA

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser
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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	4.000E-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)	1.000E+02	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	---	HGWT
R014	Saturated zone b parameter	5.300E+00	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	1.000E-03	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	---	UW
R015	Number of unsaturated zone strata	1	1	---	NS
R015	Unsat. zone 1, thickness (m)	4.000E+00	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.500E+00	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	4.000E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	2.000E-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	5.300E+00	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for 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	7.860E-03	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for Pa-231				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.164E-03	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Pb-210				
R016	Contaminated zone (cm**3/g)	2.100E+03	1.000E+02	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	2.100E+03	1.000E+02	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	2.100E+03	1.000E+02	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.564E-05	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	3.800E+04	7.000E+01	---	DCNUCC(4)
R016	Unsaturated zone 1 (cm**3/g)	3.800E+04	7.000E+01	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	3.800E+04	7.000E+01	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.181E-06	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Th-230				
R016	Contaminated zone (cm**3/g)	4.500E+03	6.000E+04	---	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	4.500E+03	6.000E+04	---	DCNUCU(5,1)
R016	Saturated zone (cm**3/g)	4.500E+03	6.000E+04	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.530E-05	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(6)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.164E-03	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R016	Distribution coefficients for U-235				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(7)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(7,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.164E-03	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(8)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(8,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.164E-03	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R017	Inhalation rate (m**3/yr)	2.000E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	6.000E+00	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	1.000E+00	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	1.200E-02	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)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	1.016E+02	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	not used	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	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	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	not used	-1	---	FPLANT
R018	Contamination fraction of meat	2.230E-01	-1	---	FMEAT
R018	Contamination fraction of milk	not used	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	6.800E+01	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	5.000E+01	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	not used	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	not used	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	0.000E+00	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	0.000E+00	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	1.100E+00	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	not used	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	8.000E-02	8.000E-02	---	TE(3)

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser
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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	not used	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	1.000E+00	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	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)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
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	0.000E+00	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

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser
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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	257	---	---	KYMAX

Summary of Pathway Selections

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

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser

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Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	16200.00 square meters	Ac-227	1.000E+00
Thickness:	1.37 meters	Pa-231	1.000E+00
Cover Depth:	0.15 meters	Pb-210	1.000E+00
		Ra-226	1.000E+00
		Th-230	1.000E+00
		U-234	1.000E+00
		U-235	1.000E+00
		U-238	1.000E+00

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):	6.276E-01	6.272E-01	6.263E-01	6.235E-01	6.159E-01	5.933E-01	5.554E-01	5.734E-01
M(t):	2.510E-02	2.509E-02	2.505E-02	2.494E-02	2.463E-02	2.373E-02	2.222E-02	2.294E-02

Maximum TDOSE(t): 6.276E-01 mrem/yr at t = 0.000E+00 years

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Ac-227	1.047E-03	0.0017	8.128E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.695E-04	0.0006	0.000E+00	0.0000	5.004E-07	0.0000
Pa-231	1.134E-04	0.0002	2.314E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.904E-01	0.3034	0.000E+00	0.0000	2.695E-07	0.0000
Pb-210	1.138E-06	0.0000	1.555E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.310E-01	0.2088	0.000E+00	0.0000	1.112E-06	0.0000
Ra-226	1.525E-02	0.0243	1.466E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.879E-01	0.4588	0.000E+00	0.0000	5.094E-07	0.0000
Th-230	3.399E-06	0.0000	1.415E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.603E-04	0.0003	0.000E+00	0.0000	7.145E-08	0.0000
U-234	2.042E-08	0.0000	1.426E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.985E-04	0.0005	0.000E+00	0.0000	2.394E-08	0.0000
U-235	2.226E-04	0.0004	1.313E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.859E-04	0.0005	0.000E+00	0.0000	2.278E-08	0.0000
U-238	1.369E-04	0.0002	1.242E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.872E-04	0.0005	0.000E+00	0.0000	2.303E-08	0.0000
Total	1.678E-02	0.0267	1.256E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.108E-01	0.9733	0.000E+00	0.0000	2.532E-06	0.0000

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

Water Dependent Pathways

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.418E-03	0.0023
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.905E-01	0.3036
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.310E-01	0.2088
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.032E-01	0.4831
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.639E-04	0.0003
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.986E-04	0.0005
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.085E-04	0.0008
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.242E-04	0.0007
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.276E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 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.
Ac-227	1.007E-03	0.0016	2.354E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.556E-04	0.0006	0.000E+00	0.0000	1.449E-06	0.0000
Pa-231	1.459E-04	0.0002	7.598E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.899E-01	0.3028	0.000E+00	0.0000	8.478E-07	0.0000
Pb-210	1.105E-06	0.0000	4.539E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.271E-01	0.2026	0.000E+00	0.0000	3.244E-06	0.0000
Ra-226	1.526E-02	0.0243	4.523E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.919E-01	0.4654	0.000E+00	0.0000	1.618E-06	0.0000
Th-230	1.001E-05	0.0000	4.245E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.861E-04	0.0005	0.000E+00	0.0000	2.149E-07	0.0000
U-234	2.046E-08	0.0000	4.268E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.980E-04	0.0005	0.000E+00	0.0000	7.160E-08	0.0000
U-235	2.222E-04	0.0004	3.928E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.894E-04	0.0005	0.000E+00	0.0000	6.816E-08	0.0000
U-238	1.366E-04	0.0002	3.716E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.868E-04	0.0005	0.000E+00	0.0000	6.889E-08	0.0000
Total	1.678E-02	0.0268	3.748E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.104E-01	0.9732	0.000E+00	0.0000	7.583E-06	0.0000

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

Water Dependent Pathways

Radio-	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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.367E-03	0.0022
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.901E-01	0.3030
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.271E-01	0.2026
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.072E-01	0.4897
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.968E-04	0.0005
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.982E-04	0.0005
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.117E-04	0.0008
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.234E-04	0.0007
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.272E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 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.
Ac-227	9.326E-04	0.0015	5.079E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.295E-04	0.0005	0.000E+00	0.0000	3.127E-06	0.0000
Pa-231	2.069E-04	0.0003	2.092E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.889E-01	0.3016	0.000E+00	0.0000	2.169E-06	0.0000
Pb-210	1.041E-06	0.0000	9.961E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.195E-01	0.1908	0.000E+00	0.0000	7.119E-06	0.0000
Ra-226	1.527E-02	0.0244	1.117E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.994E-01	0.4780	0.000E+00	0.0000	4.222E-06	0.0000
Th-230	2.326E-05	0.0000	9.905E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.431E-04	0.0009	0.000E+00	0.0000	5.049E-07	0.0000
U-234	2.071E-08	0.0000	9.898E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.970E-04	0.0005	0.000E+00	0.0000	1.660E-07	0.0000
U-235	2.214E-04	0.0004	9.117E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.964E-04	0.0005	0.000E+00	0.0000	1.581E-07	0.0000
U-238	1.359E-04	0.0002	8.617E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.858E-04	0.0005	0.000E+00	0.0000	1.598E-07	0.0000
Total	1.679E-02	0.0268	8.649E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.095E-01	0.9732	0.000E+00	0.0000	1.763E-05	0.0000

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

Water Dependent Pathways

Radio-	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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.270E-03	0.0020
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.891E-01	0.3019
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.195E-01	0.1908
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.147E-01	0.5024
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.679E-04	0.0009
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.973E-04	0.0005
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.181E-04	0.0008
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.220E-04	0.0007
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.263E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser
File : C:\USERS\H5TDERJC\DESKTOP\NFSS\02 - VPH\13 - RISK ASSESSMENT\04 - RESRAD\FINAL\ADOLESCENT TR SUBSURFACE SOIL.RAD

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	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.
Ac-227	7.121E-04	0.0011	1.155E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.521E-04	0.0004	0.000E+00	0.0000	7.110E-06	0.0000
Pa-231	3.848E-04	0.0006	9.062E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.853E-01	0.2973	0.000E+00	0.0000	8.164E-06	0.0000
Pb-210	8.447E-07	0.0000	2.404E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.637E-02	0.1546	0.000E+00	0.0000	1.718E-05	0.0000
Ra-226	1.531E-02	0.0246	3.924E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.223E-01	0.5168	0.000E+00	0.0000	1.679E-05	0.0000
Th-230	6.988E-05	0.0001	2.972E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.490E-03	0.0024	0.000E+00	0.0000	1.559E-06	0.0000
U-234	2.345E-08	0.0000	2.906E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.936E-04	0.0005	0.000E+00	0.0000	4.873E-07	0.0000
U-235	2.187E-04	0.0004	2.687E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.203E-04	0.0005	0.000E+00	0.0000	4.652E-07	0.0000
U-238	1.338E-04	0.0002	2.529E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.825E-04	0.0005	0.000E+00	0.0000	4.688E-07	0.0000
Total	1.683E-02	0.0270	2.503E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.066E-01	0.9729	0.000E+00	0.0000	5.222E-05	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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.829E-04	0.0016
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.857E-01	0.2979
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.638E-02	0.1546
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.376E-01	0.5414
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.565E-03	0.0025
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.944E-04	0.0005
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.398E-04	0.0009
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.170E-04	0.0007
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.235E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser
File : C:\USERS\H5TDERJC\DESKTOP\NFSS\02 - VPH\13 - RISK ASSESSMENT\04 - RESRAD\FINAL\ADOLESCENT TR SUBSURFACE SOIL.RAD

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	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.
Ac-227	3.295E-04	0.0005	1.517E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.173E-04	0.0002	0.000E+00	0.0000	9.338E-06	0.0000
Pa-231	6.787E-04	0.0011	3.892E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	1.755E-01	0.2850	0.000E+00	0.0000	3.101E-05	0.0001
Pb-210	4.655E-07	0.0000	3.745E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.212E-02	0.0846	0.000E+00	0.0000	2.676E-05	0.0000
Ra-226	1.542E-02	0.0250	1.451E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.655E-01	0.5934	0.000E+00	0.0000	7.131E-05	0.0001
Th-230	2.051E-04	0.0003	8.636E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.506E-03	0.0073	0.000E+00	0.0000	5.055E-06	0.0000
U-234	4.706E-08	0.0000	7.939E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.842E-04	0.0005	0.000E+00	0.0000	1.330E-06	0.0000
U-235	2.114E-04	0.0003	7.464E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.830E-04	0.0006	0.000E+00	0.0000	1.280E-06	0.0000
U-238	1.279E-04	0.0002	6.896E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.729E-04	0.0004	0.000E+00	0.0000	1.278E-06	0.0000
Total	1.697E-02	0.0276	6.678E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	5.987E-01	0.9721	0.000E+00	0.0000	1.474E-04	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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.713E-04	0.0008
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.763E-01	0.2862
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.215E-02	0.0847
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.810E-01	0.6186
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.724E-03	0.0077
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.864E-04	0.0005
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.964E-04	0.0010
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.029E-04	0.0007
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.159E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser
File : C:\USERS\H5TDERJC\DESKTOP\NFSS\02 - VPH\13 - RISK ASSESSMENT\04 - RESRAD\FINAL\ADOLESCENT TR SUBSURFACE SOIL.RAD

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	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.
Ac-227	2.220E-05	0.0000	3.105E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.017E-06	0.0000	0.000E+00	0.0000	1.912E-06	0.0000
Pa-231	8.193E-04	0.0014	1.348E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	1.447E-01	0.2439	0.000E+00	0.0000	1.016E-04	0.0002
Pb-210	5.781E-08	0.0000	1.393E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.061E-03	0.0102	0.000E+00	0.0000	9.959E-06	0.0000
Ra-226	1.582E-02	0.0267	5.708E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.066E-01	0.6853	0.000E+00	0.0000	3.043E-04	0.0005
Th-230	7.028E-04	0.0012	2.853E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.660E-02	0.0280	0.000E+00	0.0000	2.517E-05	0.0000
U-234	3.071E-07	0.0000	2.112E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.565E-04	0.0004	0.000E+00	0.0000	3.522E-06	0.0000
U-235	1.881E-04	0.0003	2.156E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.457E-04	0.0009	0.000E+00	0.0000	3.521E-06	0.0000
U-238	1.093E-04	0.0002	1.821E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.406E-04	0.0004	0.000E+00	0.0000	3.376E-06	0.0000
Total	1.766E-02	0.0298	1.784E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	5.750E-01	0.9692	0.000E+00	0.0000	4.534E-04	0.0008

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.524E-05	0.0001
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.458E-01	0.2457
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.072E-03	0.0102
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.227E-01	0.7124
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.736E-02	0.0293
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.624E-04	0.0004
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.395E-04	0.0012
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.552E-04	0.0006
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.933E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser
File : C:\USERS\H5TDERJC\DESKTOP\NFSS\02 - VPH\13 - RISK ASSESSMENT\04 - RESRAD\FINAL\ADOLESCENT TR SUBSURFACE SOIL.RAD

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	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.
Ac-227	9.992E-09	0.0000	3.310E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.600E-09	0.0000	0.000E+00	0.0000	2.038E-09	0.0000
Pa-231	5.602E-04	0.0010	2.174E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	8.293E-02	0.1493	0.000E+00	0.0000	1.632E-04	0.0003
Pb-210	1.492E-10	0.0000	8.192E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.291E-05	0.0000	0.000E+00	0.0000	5.855E-08	0.0000
Ra-226	1.703E-02	0.0307	1.602E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.968E-01	0.7144	0.000E+00	0.0000	8.613E-04	0.0016
Th-230	2.353E-03	0.0042	8.600E-05	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	5.295E-02	0.0953	0.000E+00	0.0000	1.518E-04	0.0003
U-234	2.437E-06	0.0000	3.466E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.205E-04	0.0004	0.000E+00	0.0000	5.747E-06	0.0000
U-235	1.347E-04	0.0002	4.343E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.879E-04	0.0012	0.000E+00	0.0000	6.282E-06	0.0000
U-238	6.981E-05	0.0001	2.894E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.611E-04	0.0003	0.000E+00	0.0000	5.365E-06	0.0000
Total	2.015E-02	0.0363	3.301E-04	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	5.337E-01	0.9610	0.000E+00	0.0000	1.194E-03	0.0021

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.994E-09	0.0000	0.000E+00	0.0000	2.393E-08	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.690E-07	0.0000	0.000E+00	0.0000	8.387E-02	0.1510
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.297E-05	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.147E-01	0.7466
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.554E-02	0.1000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.322E-04	0.0004
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.455E-09	0.0000	0.000E+00	0.0000	8.333E-04	0.0015
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.391E-04	0.0004
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.764E-07	0.0000	0.000E+00	0.0000	5.554E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 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.
Ac-227	1.944E-20	0.0000	9.433E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.303E-21	0.0000	0.000E+00	0.0000	5.807E-21	0.0000
Pa-231	1.373E-04	0.0002	7.787E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	1.132E-02	0.0197	0.000E+00	0.0000	5.846E-05	0.0001
Pb-210	1.308E-19	0.0000	9.192E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.516E-15	0.0000	0.000E+00	0.0000	6.569E-17	0.0000
Ra-226	2.207E-02	0.0385	3.928E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	3.402E-01	0.5933	0.000E+00	0.0000	2.112E-03	0.0037
Th-230	1.172E-02	0.0204	2.913E-04	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	1.785E-01	0.3114	0.000E+00	0.0000	1.227E-03	0.0021
U-234	2.435E-05	0.0000	1.992E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.008E-04	0.0007	0.000E+00	0.0000	4.641E-06	0.0000
U-235	4.142E-05	0.0001	2.741E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.721E-04	0.0005	0.000E+00	0.0000	3.156E-06	0.0000
U-238	1.463E-05	0.0000	1.055E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.054E-05	0.0001	0.000E+00	0.0000	1.956E-06	0.0000
Total	3.400E-02	0.0593	4.142E-04	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	5.308E-01	0.9257	0.000E+00	0.0000	3.407E-03	0.0059

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.838E-20	0.0000	0.000E+00	0.0000	1.184E-19	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.600E-03	0.0080	0.000E+00	0.0000	1.620E-02	0.0282
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.583E-15	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.644E-01	0.6356
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.918E-01	0.3345
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.880E-05	0.0001	0.000E+00	0.0000	4.606E-04	0.0008
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.258E-04	0.0002	0.000E+00	0.0000	4.453E-04	0.0008
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.785E-05	0.0000	0.000E+00	0.0000	7.604E-05	0.0001
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.782E-03	0.0083	0.000E+00	0.0000	5.734E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser
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Dose/Source Ratios Summed Over All Pathways
Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g) 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-227+D	Ac-227+D	1.000E+00	1.418E-03	1.367E-03	1.270E-03	9.829E-04	4.713E-04	3.524E-05	2.393E-08	1.184E-19
Pa-231	Pa-231	1.000E+00	1.899E-01	1.893E-01	1.883E-01	1.847E-01	1.748E-01	1.441E-01	8.263E-02	1.580E-02
Pa-231	Ac-227+D	1.000E+00	6.632E-04	7.194E-04	7.997E-04	1.037E-03	1.443E-03	1.671E-03	1.246E-03	4.003E-04
Pa-231	äDSR(j)		1.905E-01	1.901E-01	1.891E-01	1.857E-01	1.763E-01	1.458E-01	8.387E-02	1.620E-02
Pb-210+D	Pb-210+D	1.000E+00	1.310E-01	1.271E-01	1.195E-01	9.638E-02	5.215E-02	6.072E-03	1.297E-05	5.583E-15
Ra-226+D	Ra-226+D	1.000E+00	3.003E-01	3.002E-01	3.001E-01	2.996E-01	2.982E-01	2.933E-01	2.799E-01	2.377E-01
Ra-226+D	Pb-210+D	1.000E+00	2.933E-03	6.962E-03	1.462E-02	3.802E-02	8.279E-02	1.294E-01	1.348E-01	1.267E-01
Ra-226+D	äDSR(j)		3.032E-01	3.072E-01	3.147E-01	3.376E-01	3.810E-01	4.227E-01	4.147E-01	3.644E-01
Th-230	Th-230	1.000E+00	1.050E-04	1.058E-04	1.074E-04	1.129E-04	1.289E-04	1.845E-04	3.413E-04	8.690E-04
Th-230	Ra-226+D	1.000E+00	5.844E-05	1.884E-04	4.485E-04	1.359E-03	3.957E-03	1.302E-02	3.867E-02	1.262E-01
Th-230	Pb-210+D	1.000E+00	4.688E-07	2.621E-06	1.201E-05	9.323E-05	6.390E-04	4.154E-03	1.653E-02	6.469E-02
Th-230	äDSR(j)		1.639E-04	2.968E-04	5.679E-04	1.565E-03	4.724E-03	1.736E-02	5.554E-02	1.918E-01
U-234	U-234	1.000E+00	2.986E-04	2.982E-04	2.973E-04	2.943E-04	2.858E-04	2.556E-04	1.760E-04	6.335E-05
U-234	Th-230	1.000E+00	8.505E-10	1.811E-09	3.748E-09	1.088E-08	3.412E-08	1.435E-07	5.992E-07	2.396E-06
U-234	Ra-226+D	1.000E+00	1.664E-10	1.275E-09	6.986E-09	6.330E-08	5.265E-07	5.349E-06	3.981E-05	2.622E-04
U-234	Pb-210+D	1.000E+00	1.153E-12	1.374E-11	1.351E-10	3.055E-09	6.178E-08	1.391E-06	1.576E-05	1.327E-04
U-234	äDSR(j)		2.986E-04	2.982E-04	2.973E-04	2.944E-04	2.864E-04	2.624E-04	2.322E-04	4.606E-04
U-235+D	U-235+D	1.000E+00	5.067E-04	5.059E-04	5.043E-04	4.988E-04	4.831E-04	4.299E-04	2.990E-04	9.897E-05
U-235+D	Pa-231	1.000E+00	1.796E-06	5.793E-06	1.373E-05	4.083E-05	1.127E-04	3.066E-04	5.269E-04	3.379E-04
U-235+D	Ac-227+D	1.000E+00	6.342E-09	2.107E-08	5.304E-08	1.880E-07	7.087E-07	2.939E-06	7.383E-06	8.349E-06
U-235+D	äDSR(j)		5.085E-04	5.117E-04	5.181E-04	5.398E-04	5.964E-04	7.395E-04	8.333E-04	4.453E-04
U-238	U-238	5.400E-05	1.460E-08	1.458E-08	1.454E-08	1.439E-08	1.397E-08	1.249E-08	8.605E-09	3.104E-09
U-238+D	U-238+D	9.999E-01	4.241E-04	4.234E-04	4.220E-04	4.170E-04	4.028E-04	3.551E-04	2.390E-04	7.562E-05
U-238+D	U-234	9.999E-01	4.231E-10	1.268E-09	2.950E-09	8.761E-09	2.471E-08	7.282E-08	1.500E-07	1.799E-07
U-238+D	Th-230	9.999E-01	9.642E-16	4.749E-15	2.055E-14	1.668E-13	1.468E-12	1.943E-11	2.160E-10	1.865E-09
U-238+D	Ra-226+D	9.999E-01	1.118E-16	1.877E-15	2.304E-14	6.227E-13	1.493E-11	4.834E-10	9.749E-09	1.526E-07
U-238+D	Pb-210+D	9.999E-01	7.013E-19	1.722E-17	3.589E-16	2.347E-14	1.385E-12	1.062E-10	3.569E-09	7.592E-08
U-238+D	äDSR(j)		4.241E-04	4.234E-04	4.220E-04	4.170E-04	4.029E-04	3.552E-04	2.391E-04	7.603E-05

The DSR includes contributions from associated (half-life ó 180 days) daughters.

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser
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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
Ac-227	1.763E+04	1.829E+04	1.968E+04	2.543E+04	5.304E+04	7.095E+05	1.045E+09	*7.232E+13
Pa-231	1.312E+02	1.315E+02	1.322E+02	1.346E+02	1.418E+02	1.715E+02	2.981E+02	1.544E+03
Pb-210	1.908E+02	1.967E+02	2.092E+02	2.594E+02	4.794E+02	4.118E+03	1.928E+06	*7.634E+13
Ra-226	8.246E+01	8.139E+01	7.945E+01	7.406E+01	6.562E+01	5.914E+01	6.029E+01	6.860E+01
Th-230	1.526E+05	8.424E+04	4.402E+04	1.598E+04	5.292E+03	1.440E+03	4.501E+02	1.304E+02
U-234	8.372E+04	8.384E+04	8.408E+04	8.491E+04	8.729E+04	9.526E+04	1.077E+05	5.427E+04
U-235	4.916E+04	4.886E+04	4.825E+04	4.631E+04	4.192E+04	3.381E+04	3.000E+04	5.615E+04
U-238	5.894E+04	5.904E+04	5.924E+04	5.995E+04	6.206E+04	7.039E+04	1.045E+05	3.288E+05

*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) (pCi/g)	G(i,tmin) (pCi/g)	DSR(i,tmax) (pCi/g)	G(i,tmax) (pCi/g)
Ac-227	1.000E+00	0.000E+00	1.418E-03	1.763E+04	1.418E-03	1.763E+04
Pa-231	1.000E+00	0.000E+00	1.905E-01	1.312E+02	1.905E-01	1.312E+02
Pb-210	1.000E+00	0.000E+00	1.310E-01	1.908E+02	1.310E-01	1.908E+02
Ra-226	1.000E+00	132.2 ñ 0.3	4.243E-01	5.892E+01	3.032E-01	8.246E+01
Th-230	1.000E+00	1.000E+03	1.918E-01	1.304E+02	1.639E-04	1.526E+05
U-234	1.000E+00	1.000E+03	4.606E-04	5.427E+04	2.986E-04	8.372E+04
U-235	1.000E+00	252.7 ñ 0.5	8.399E-04	2.976E+04	5.085E-04	4.916E+04
U-238	1.000E+00	0.000E+00	4.242E-04	5.894E+04	4.242E-04	5.894E+04

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser
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Individual Nuclide Dose Summed Over All Pathways
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	DOSE(j,t), mrem/yr t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-227	Ac-227	1.000E+00	1.418E-03	1.367E-03	1.270E-03	9.829E-04	4.713E-04	3.524E-05	2.393E-08	1.184E-19
Ac-227	Pa-231	1.000E+00	6.632E-04	7.194E-04	7.997E-04	1.037E-03	1.443E-03	1.671E-03	1.246E-03	4.003E-04
Ac-227	U-235	1.000E+00	6.342E-09	2.107E-08	5.304E-08	1.880E-07	7.087E-07	2.939E-06	7.383E-06	8.349E-06
Ac-227	äDOSE(j)		2.081E-03	2.086E-03	2.070E-03	2.020E-03	1.915E-03	1.709E-03	1.253E-03	4.086E-04
Pa-231	Pa-231	1.000E+00	1.899E-01	1.893E-01	1.883E-01	1.847E-01	1.748E-01	1.441E-01	8.263E-02	1.580E-02
Pa-231	U-235	1.000E+00	1.796E-06	5.793E-06	1.373E-05	4.083E-05	1.127E-04	3.066E-04	5.269E-04	3.379E-04
Pa-231	äDOSE(j)		1.899E-01	1.893E-01	1.883E-01	1.848E-01	1.749E-01	1.444E-01	8.315E-02	1.613E-02
Pb-210	Pb-210	1.000E+00	1.310E-01	1.271E-01	1.195E-01	9.638E-02	5.215E-02	6.072E-03	1.297E-05	5.583E-15
Pb-210	Ra-226	1.000E+00	2.933E-03	6.962E-03	1.462E-02	3.802E-02	8.279E-02	1.294E-01	1.348E-01	1.267E-01
Pb-210	Th-230	1.000E+00	4.688E-07	2.621E-06	1.201E-05	9.323E-05	6.390E-04	4.154E-03	1.653E-02	6.469E-02
Pb-210	U-234	1.000E+00	1.153E-12	1.374E-11	1.351E-10	3.055E-09	6.178E-08	1.391E-06	1.576E-05	1.327E-04
Pb-210	U-238	9.999E-01	7.013E-19	1.722E-17	3.589E-16	2.347E-14	1.385E-12	1.062E-10	3.569E-09	7.592E-08
Pb-210	äDOSE(j)		1.340E-01	1.340E-01	1.341E-01	1.345E-01	1.356E-01	1.396E-01	1.514E-01	1.915E-01
Ra-226	Ra-226	1.000E+00	3.003E-01	3.002E-01	3.001E-01	2.996E-01	2.982E-01	2.933E-01	2.799E-01	2.377E-01
Ra-226	Th-230	1.000E+00	5.844E-05	1.884E-04	4.485E-04	1.359E-03	3.957E-03	1.302E-02	3.867E-02	1.262E-01
Ra-226	U-234	1.000E+00	1.664E-10	1.275E-09	6.986E-09	6.330E-08	5.265E-07	5.349E-06	3.981E-05	2.622E-04
Ra-226	U-238	9.999E-01	1.118E-16	1.877E-15	2.304E-14	6.227E-13	1.493E-11	4.834E-10	9.749E-09	1.526E-07
Ra-226	äDOSE(j)		3.003E-01	3.004E-01	3.005E-01	3.009E-01	3.021E-01	3.063E-01	3.186E-01	3.642E-01
Th-230	Th-230	1.000E+00	1.050E-04	1.058E-04	1.074E-04	1.129E-04	1.289E-04	1.845E-04	3.413E-04	8.690E-04
Th-230	U-234	1.000E+00	8.505E-10	1.811E-09	3.748E-09	1.088E-08	3.412E-08	1.435E-07	5.992E-07	2.396E-06
Th-230	U-238	9.999E-01	9.642E-16	4.749E-15	2.055E-14	1.668E-13	1.468E-12	1.943E-11	2.160E-10	1.865E-09
Th-230	äDOSE(j)		1.050E-04	1.058E-04	1.074E-04	1.130E-04	1.289E-04	1.846E-04	3.419E-04	8.714E-04
U-234	U-234	1.000E+00	2.986E-04	2.982E-04	2.973E-04	2.943E-04	2.858E-04	2.556E-04	1.760E-04	6.335E-05
U-234	U-238	9.999E-01	4.231E-10	1.268E-09	2.950E-09	8.761E-09	2.471E-08	7.282E-08	1.500E-07	1.799E-07
U-234	äDOSE(j)		2.986E-04	2.982E-04	2.973E-04	2.944E-04	2.858E-04	2.556E-04	1.762E-04	6.353E-05
U-235	U-235	1.000E+00	5.067E-04	5.059E-04	5.043E-04	4.988E-04	4.831E-04	4.299E-04	2.990E-04	9.897E-05
U-238	U-238	5.400E-05	1.460E-08	1.458E-08	1.454E-08	1.439E-08	1.397E-08	1.249E-08	8.605E-09	3.104E-09
U-238	U-238	9.999E-01	4.241E-04	4.234E-04	4.220E-04	4.170E-04	4.028E-04	3.551E-04	2.390E-04	7.562E-05
U-238	äDOSE(j)		4.242E-04	4.234E-04	4.220E-04	4.170E-04	4.028E-04	3.551E-04	2.390E-04	7.563E-05

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

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser
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Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-227	Ac-227	1.000E+00	1.000E+00	9.611E-01	8.877E-01	6.724E-01	3.040E-01	1.888E-02	6.732E-06	5.762E-18
Ac-227	Pa-231	1.000E+00	0.000E+00	3.116E-02	8.960E-02	2.583E-01	5.275E-01	6.176E-01	3.354E-01	3.608E-02
Ac-227	U-235	1.000E+00	0.000E+00	3.317E-07	2.896E-06	2.899E-05	1.974E-04	9.846E-04	1.940E-03	7.501E-04
Ac-227	äS(j):		1.000E+00	9.922E-01	9.773E-01	9.307E-01	8.316E-01	6.375E-01	3.373E-01	3.683E-02
Pa-231	Pa-231	1.000E+00	1.000E+00	9.968E-01	9.905E-01	9.687E-01	9.089E-01	7.272E-01	3.846E-01	4.137E-02
Pa-231	U-235	1.000E+00	0.000E+00	2.109E-05	6.287E-05	2.050E-04	5.771E-04	1.540E-03	2.449E-03	8.847E-04
Pa-231	äS(j):		1.000E+00	9.968E-01	9.906E-01	9.689E-01	9.094E-01	7.288E-01	3.871E-01	4.226E-02
Pb-210	Pb-210	1.000E+00	1.000E+00	9.693E-01	9.108E-01	7.323E-01	3.927E-01	4.434E-02	8.718E-05	2.938E-14
Pb-210	Ra-226	1.000E+00	0.000E+00	3.060E-02	8.896E-02	2.665E-01	6.013E-01	9.236E-01	8.873E-01	6.533E-01
Pb-210	Th-230	1.000E+00	0.000E+00	6.662E-06	5.872E-05	6.075E-04	4.518E-03	2.939E-02	1.085E-01	3.332E-01
Pb-210	U-234	1.000E+00	0.000E+00	2.003E-11	5.315E-10	1.855E-08	4.263E-07	9.767E-06	1.033E-04	6.832E-04
Pb-210	U-238	9.999E-01	0.000E+00	1.421E-17	1.134E-15	1.329E-13	9.328E-12	7.402E-10	2.333E-08	3.907E-07
Pb-210	äS(j):		1.000E+00	9.999E-01	9.998E-01	9.993E-01	9.985E-01	9.974E-01	9.960E-01	9.872E-01
Ra-226	Ra-226	1.000E+00	1.000E+00	9.996E-01	9.987E-01	9.956E-01	9.870E-01	9.572E-01	8.770E-01	6.457E-01
Ra-226	Th-230	1.000E+00	0.000E+00	4.331E-04	1.299E-03	4.322E-03	1.290E-02	4.229E-02	1.210E-01	3.427E-01
Ra-226	U-234	1.000E+00	0.000E+00	1.948E-09	1.749E-08	1.926E-07	1.692E-06	1.731E-05	1.244E-04	7.118E-04
Ra-226	U-238	9.999E-01	0.000E+00	1.839E-15	4.949E-14	1.811E-12	4.728E-11	1.557E-09	3.043E-08	4.142E-07
Ra-226	äS(j):		1.000E+00	1.000E+00	1.000E+00	1.000E+00	9.999E-01	9.995E-01	9.981E-01	9.891E-01
Th-230	Th-230	1.000E+00	1.000E+00	1.000E+00	9.999E-01	9.996E-01	9.987E-01	9.956E-01	9.868E-01	9.567E-01
Th-230	U-234	1.000E+00	0.000E+00	8.987E-06	2.688E-05	8.859E-05	2.575E-04	7.698E-04	1.730E-03	2.637E-03
Th-230	U-238	9.999E-01	0.000E+00	1.273E-11	1.141E-10	1.249E-09	1.078E-08	1.035E-07	6.226E-07	2.051E-06
Th-230	äS(j):		1.000E+00	1.000E+00	9.999E-01	9.996E-01	9.989E-01	9.963E-01	9.885E-01	9.593E-01
U-234	U-234	1.000E+00	1.000E+00	9.968E-01	9.905E-01	9.688E-01	9.094E-01	7.286E-01	3.867E-01	4.214E-02
U-234	U-238	9.999E-01	0.000E+00	2.826E-06	8.424E-06	2.746E-05	7.734E-05	2.066E-04	3.290E-04	1.196E-04
U-234	äS(j):		1.000E+00	9.968E-01	9.906E-01	9.689E-01	9.094E-01	7.288E-01	3.871E-01	4.226E-02
U-235	U-235	1.000E+00	1.000E+00	9.968E-01	9.906E-01	9.689E-01	9.094E-01	7.288E-01	3.871E-01	4.226E-02
U-238	U-238	5.400E-05	5.400E-05	5.383E-05	5.349E-05	5.232E-05	4.911E-05	3.935E-05	2.090E-05	2.282E-06
U-238	U-238	9.999E-01	9.999E-01	9.968E-01	9.905E-01	9.688E-01	9.094E-01	7.287E-01	3.870E-01	4.226E-02
U-238	äS(j):		1.000E+00	9.968E-01	9.906E-01	9.689E-01	9.094E-01	7.288E-01	3.871E-01	4.226E-02

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

RESCALC.EXE execution time = 2.17 seconds

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser
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Part III: Intake Quantities and Health Risk Factors

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser
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Cancer Risk Slope Factors Summary Table
Risk Library: FGR 13 Morbidity

Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-1	Ground external radiation slope factors, 1/yr per (pCi/g):			
Sf-1	Ac-227+D	1.47E-06	3.48E-10	SLPF(1,1)
Sf-1	Pa-231	1.39E-07	1.39E-07	SLPF(2,1)
Sf-1	Pb-210+D	4.21E-09	1.41E-09	SLPF(3,1)
Sf-1	Ra-226+D	8.49E-06	2.29E-08	SLPF(4,1)
Sf-1	Th-230	8.19E-10	8.19E-10	SLPF(5,1)
Sf-1	U-234	2.52E-10	2.52E-10	SLPF(6,1)
Sf-1	U-235+D	5.43E-07	5.18E-07	SLPF(7,1)
Sf-1	U-238	4.99E-11	4.99E-11	SLPF(8,1)
Sf-1	U-238+D	1.14E-07	4.99E-11	SLPF(9,1)
Sf-2	Inhalation, slope factors, 1/(pCi):			
Sf-2	Ac-227+D	2.13E-07	1.49E-07	SLPF(1,2)
Sf-2	Pa-231	7.62E-08	7.62E-08	SLPF(2,2)
Sf-2	Pb-210+D	3.08E-08	1.58E-08	SLPF(3,2)
Sf-2	Ra-226+D	2.83E-08	2.82E-08	SLPF(4,2)
Sf-2	Th-230	3.40E-08	3.40E-08	SLPF(5,2)
Sf-2	U-234	2.78E-08	2.78E-08	SLPF(6,2)
Sf-2	U-235+D	2.50E-08	2.50E-08	SLPF(7,2)
Sf-2	U-238	2.36E-08	2.36E-08	SLPF(8,2)
Sf-2	U-238+D	2.36E-08	2.36E-08	SLPF(9,2)
Sf-3	Food ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.53E-10	2.45E-10	SLPF(1,3)
Sf-3	Pa-231	2.26E-10	2.26E-10	SLPF(2,3)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF(3,3)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF(4,3)
Sf-3	Th-230	1.19E-10	1.19E-10	SLPF(5,3)
Sf-3	U-234	9.55E-11	9.55E-11	SLPF(6,3)
Sf-3	U-235+D	9.76E-11	9.44E-11	SLPF(7,3)
Sf-3	U-238	8.66E-11	8.66E-11	SLPF(8,3)
Sf-3	U-238+D	1.21E-10	8.66E-11	SLPF(9,3)
Sf-3	Water ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	4.86E-10	2.01E-10	SLPF(1,4)
Sf-3	Pa-231	1.73E-10	1.73E-10	SLPF(2,4)
Sf-3	Pb-210+D	2.66E-09	8.81E-10	SLPF(3,4)
Sf-3	Ra-226+D	3.86E-10	3.85E-10	SLPF(4,4)
Sf-3	Th-230	9.10E-11	9.10E-11	SLPF(5,4)
Sf-3	U-234	7.07E-11	7.07E-11	SLPF(6,4)
Sf-3	U-235+D	7.18E-11	6.96E-11	SLPF(7,4)
Sf-3	U-238	6.40E-11	6.40E-11	SLPF(8,4)
Sf-3	U-238+D	8.71E-11	6.40E-11	SLPF(9,4)
Sf-3	Soil ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.53E-10	2.45E-10	SLPF(1,5)
Sf-3	Pa-231	2.26E-10	2.26E-10	SLPF(2,5)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF(3,5)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF(4,5)
Sf-3	Th-230	1.19E-10	1.19E-10	SLPF(5,5)

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser
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Cancer Risk Slope Factors Summary Table (continued)
Risk Library: FGR 13 Morbidity

Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-3	U-234	9.55E-11	9.55E-11	SLPF(6,5)
Sf-3	U-235+D	9.76E-11	9.44E-11	SLPF(7,5)
Sf-3	U-238	8.66E-11	8.66E-11	SLPF(8,5)
Sf-3	U-238+D	1.21E-10	8.66E-11	SLPF(9,5)
Sf-Rn	Radon Inhalation slope factors, 1/(pCi):			
Sf-Rn	Rn-222	1.80E-12	1.80E-12	SLPFRN(1,1)
Sf-Rn	Po-218	3.70E-12	3.70E-12	SLPFRN(1,2)
Sf-Rn	Pb-214	6.20E-12	6.20E-12	SLPFRN(1,3)
Sf-Rn	Bi-214	1.50E-11	1.50E-11	SLPFRN(1,4)
Sf-Rn	Radon K factors, (mrem/WLM):			
Sf-Rn	Rn-222 Indoor	3.88E+02	3.88E+02	KFACTR(1,1)
Sf-Rn	Rn-222 Outdoor	3.88E+02	3.88E+02	KFACTR(1,2)

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

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser

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Risk Slope and Environmental Transport Factors for the Ground Pathway

Nuclide	Slope(i)*	ETFG(i,t) At Time in Years (dimensionless)							
(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
Ac-227	3.480E-10	1.792E-04	1.795E-04	1.801E-04	1.822E-04	1.883E-04	2.112E-04	2.936E-04	9.287E-04
At-218	3.570E-09	6.006E-07	6.029E-07	6.076E-07	6.243E-07	6.748E-07	8.855E-07	1.925E-06	2.914E-05
Bi-210	2.760E-09	2.003E-04	2.006E-04	2.012E-04	2.031E-04	2.088E-04	2.300E-04	3.034E-04	7.988E-04
Bi-211	1.880E-07	6.483E-04	6.491E-04	6.505E-04	6.557E-04	6.708E-04	7.263E-04	9.114E-04	2.018E-03
Bi-214	7.480E-06	1.548E-03	1.549E-03	1.551E-03	1.560E-03	1.584E-03	1.674E-03	1.958E-03	3.390E-03
Fr-223	1.400E-07	3.328E-04	3.332E-04	3.341E-04	3.374E-04	3.468E-04	3.819E-04	5.030E-04	1.319E-03
Pa-231	1.390E-07	5.492E-04	5.499E-04	5.512E-04	5.559E-04	5.695E-04	6.196E-04	7.883E-04	1.832E-03
Pa-234	8.710E-06	1.159E-03	1.160E-03	1.162E-03	1.170E-03	1.191E-03	1.268E-03	1.518E-03	2.848E-03
Pa-234m	6.870E-08	9.582E-04	9.590E-04	9.608E-04	9.669E-04	9.847E-04	1.050E-03	1.260E-03	2.384E-03
Pb-210	1.410E-09	4.955E-09	4.984E-09	5.043E-09	5.253E-09	5.903E-09	8.880E-09	2.852E-08	1.692E-06
Pb-211	2.290E-07	9.647E-04	9.656E-04	9.675E-04	9.741E-04	9.933E-04	1.064E-03	1.293E-03	2.559E-03
Pb-214	9.820E-07	6.441E-04	6.448E-04	6.463E-04	6.515E-04	6.664E-04	7.215E-04	9.055E-04	2.004E-03
Po-210	3.950E-11	1.175E-03	1.176E-03	1.178E-03	1.186E-03	1.207E-03	1.285E-03	1.536E-03	2.869E-03
Po-211	3.580E-08	1.108E-03	1.109E-03	1.111E-03	1.118E-03	1.138E-03	1.214E-03	1.459E-03	2.774E-03
Po-214	3.860E-10	1.141E-03	1.142E-03	1.144E-03	1.151E-03	1.172E-03	1.249E-03	1.497E-03	2.821E-03
Po-215	7.480E-10	7.956E-04	7.965E-04	7.982E-04	8.040E-04	8.211E-04	8.839E-04	1.091E-03	2.277E-03
Po-218	4.260E-11	1.180E-03	1.182E-03	1.184E-03	1.191E-03	1.213E-03	1.291E-03	1.543E-03	2.882E-03
Ra-223	4.340E-07	3.690E-04	3.695E-04	3.705E-04	3.741E-04	3.844E-04	4.227E-04	5.546E-04	1.434E-03
Ra-226	2.290E-08	3.504E-04	3.509E-04	3.519E-04	3.553E-04	3.652E-04	4.024E-04	5.306E-04	1.397E-03
Rn-219	2.250E-07	6.614E-04	6.622E-04	6.637E-04	6.689E-04	6.842E-04	7.404E-04	9.278E-04	2.044E-03
Rn-222	1.740E-09	8.394E-04	8.402E-04	8.420E-04	8.481E-04	8.658E-04	9.307E-04	1.144E-03	2.359E-03
Th-227	3.780E-07	4.662E-04	4.668E-04	4.680E-04	4.722E-04	4.843E-04	5.293E-04	6.822E-04	1.658E-03
Th-230	8.190E-10	8.808E-05	8.825E-05	8.858E-05	8.977E-05	9.326E-05	1.066E-04	1.560E-04	5.926E-04
Th-231	2.450E-08	7.137E-05	7.151E-05	7.180E-05	7.281E-05	7.577E-05	8.713E-05	1.299E-04	5.248E-04
Th-234	1.630E-08	5.129E-05	5.140E-05	5.162E-05	5.240E-05	5.469E-05	6.351E-05	9.735E-05	4.342E-04
Tl-207	1.520E-08	7.110E-04	7.117E-04	7.131E-04	7.182E-04	7.328E-04	7.863E-04	9.618E-04	1.947E-03
Tl-210	0.000E+00	1.471E-03	1.472E-03	1.474E-03	1.483E-03	1.507E-03	1.594E-03	1.871E-03	3.284E-03
U-234	2.520E-10	5.938E-05	5.950E-05	5.974E-05	6.059E-05	6.307E-05	7.259E-05	1.085E-04	4.425E-04
U-235	5.180E-07	3.342E-04	3.347E-04	3.356E-04	3.389E-04	3.485E-04	3.845E-04	5.090E-04	1.359E-03
U-238	4.990E-11	1.602E-08	1.610E-08	1.627E-08	1.686E-08	1.867E-08	2.668E-08	7.399E-08	2.628E-06

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

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

	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways				
Radio-Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	0.000E+00	0.000E+00	6.419E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.419E-02
Pa-231	0.000E+00	0.000E+00	6.419E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.419E+01
Pb-210	0.000E+00	0.000E+00	1.027E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.027E+01
Ra-226	0.000E+00	0.000E+00	5.135E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.135E+01
Th-230	0.000E+00	0.000E+00	1.284E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.284E-01
U-234	0.000E+00	0.000E+00	1.091E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.091E+00
U-235	0.000E+00	0.000E+00	1.091E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.091E+00
U-238	0.000E+00	0.000E+00	1.091E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.091E+00

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	4.931E-09	0.0091	2.872E-12	0.0000	0.000E+00	0.0000	6.788E-10	0.0013	0.000E+00	0.0000	1.998E-12	0.0000
Pa-231	4.554E-10	0.0008	1.046E-12	0.0000	0.000E+00	0.0000	8.634E-08	0.1592	0.000E+00	0.0000	7.038E-13	0.0000
Pb-210	3.610E-12	0.0000	4.276E-13	0.0000	0.000E+00	0.0000	2.138E-07	0.3944	0.000E+00	0.0000	1.085E-11	0.0000
Ra-226	7.349E-08	0.1355	3.932E-13	0.0000	0.000E+00	0.0000	1.587E-07	0.2926	0.000E+00	0.0000	1.623E-12	0.0000
Th-230	4.352E-13	0.0000	4.728E-13	0.0000	0.000E+00	0.0000	9.262E-11	0.0002	0.000E+00	0.0000	3.752E-13	0.0000
U-234	8.948E-14	0.0000	3.818E-13	0.0000	0.000E+00	0.0000	6.222E-10	0.0011	0.000E+00	0.0000	2.974E-13	0.0000
U-235	1.044E-09	0.0019	3.433E-13	0.0000	0.000E+00	0.0000	6.361E-10	0.0012	0.000E+00	0.0000	3.040E-13	0.0000
U-238	5.949E-10	0.0011	3.245E-13	0.0000	0.000E+00	0.0000	7.857E-10	0.0014	0.000E+00	0.0000	3.756E-13	0.0000
Total	8.052E-08	0.1485	6.262E-12	0.0000	0.000E+00	0.0000	4.616E-07	0.8515	0.000E+00	0.0000	1.653E-11	0.0000

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.615E-09	0.0104
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.680E-08	0.1601
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.138E-07	0.3944
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.322E-07	0.4282
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.391E-11	0.0002
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.229E-10	0.0011
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.680E-09	0.0031
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.381E-09	0.0025
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.422E-07	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	4.488E-09	0.0083	2.530E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.248E-10	0.0004	0.000E+00	0.0000	1.760E-12	0.0000
Pa-231	8.986E-10	0.0017	1.389E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.679E-08	0.1601	0.000E+00	0.0000	9.422E-13	0.0000
Pb-210	3.293E-12	0.0000	3.780E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.937E-07	0.3573	0.000E+00	0.0000	9.595E-12	0.0000
Ra-226	7.339E-08	0.1354	4.421E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.785E-07	0.3293	0.000E+00	0.0000	2.879E-12	0.0000
Th-230	9.593E-11	0.0002	4.735E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.132E-10	0.0006	0.000E+00	0.0000	3.793E-13	0.0000
U-234	9.120E-14	0.0000	3.818E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.222E-10	0.0011	0.000E+00	0.0000	2.974E-13	0.0000
U-235	1.044E-09	0.0019	3.434E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.415E-10	0.0012	0.000E+00	0.0000	3.041E-13	0.0000
U-238	5.949E-10	0.0011	3.245E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.858E-10	0.0014	0.000E+00	0.0000	3.756E-13	0.0000
Total	8.052E-08	0.1485	6.262E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.616E-07	0.8515	0.000E+00	0.0000	1.653E-11	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.717E-09	0.0087
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.769E-08	0.1617
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.938E-07	0.3574
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.519E-07	0.4646
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.099E-10	0.0008
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.229E-10	0.0011
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.686E-09	0.0031
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.381E-09	0.0025
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.422E-07	1.0000

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

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

	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways				
Radio-Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	7.667E-07	0.000E+00	1.752E-01	0.000E+00	1.739E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.754E-01
Pa-231	7.703E-07	0.000E+00	6.402E+01	0.000E+00	1.747E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.402E+01
Pb-210	7.727E-07	0.000E+00	1.034E+01	0.000E+00	1.752E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.034E+01
Ra-226	7.727E-07	0.000E+00	5.136E+01	0.000E+00	1.752E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.136E+01
Th-230	7.727E-07	0.000E+00	1.288E-01	0.000E+00	1.752E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.290E-01
U-234	7.703E-07	0.000E+00	1.089E+00	0.000E+00	1.747E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.090E+00
U-235	7.703E-07	0.000E+00	1.089E+00	0.000E+00	1.747E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.090E+00
U-238	7.703E-07	0.000E+00	1.089E+00	0.000E+00	1.747E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.090E+00

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	4.901E-09	0.0090	3.809E-12	0.0000	0.000E+00	0.0000	6.784E-10	0.0013	0.000E+00	0.0000	2.650E-12	0.0000
Pa-231	4.545E-10	0.0008	1.392E-12	0.0000	0.000E+00	0.0000	8.610E-08	0.1588	0.000E+00	0.0000	9.361E-13	0.0000
Pb-210	3.615E-12	0.0000	5.701E-13	0.0000	0.000E+00	0.0000	2.139E-07	0.3946	0.000E+00	0.0000	1.447E-11	0.0000
Ra-226	7.355E-08	0.1357	5.242E-13	0.0000	0.000E+00	0.0000	1.587E-07	0.2927	0.000E+00	0.0000	2.164E-12	0.0000
Th-230	4.361E-13	0.0000	6.304E-13	0.0000	0.000E+00	0.0000	9.295E-11	0.0002	0.000E+00	0.0000	5.003E-13	0.0000
U-234	8.938E-14	0.0000	5.078E-13	0.0000	0.000E+00	0.0000	6.211E-10	0.0011	0.000E+00	0.0000	3.956E-13	0.0000
U-235	1.042E-09	0.0019	4.567E-13	0.0000	0.000E+00	0.0000	6.350E-10	0.0012	0.000E+00	0.0000	4.044E-13	0.0000
U-238	5.935E-10	0.0011	4.317E-13	0.0000	0.000E+00	0.0000	7.844E-10	0.0014	0.000E+00	0.0000	4.996E-13	0.0000
Total	8.054E-08	0.1486	8.322E-12	0.0000	0.000E+00	0.0000	4.615E-07	0.8514	0.000E+00	0.0000	2.202E-11	0.0000

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.585E-09	0.0103
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.656E-08	0.1597
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.139E-07	0.3946
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.322E-07	0.4284
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.452E-11	0.0002
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.221E-10	0.0011
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.678E-09	0.0031
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.379E-09	0.0025
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.421E-07	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	4.318E-09	0.0080	3.275E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.164E-10	0.0004	0.000E+00	0.0000	2.278E-12	0.0000
Pa-231	1.037E-09	0.0019	1.926E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.656E-08	0.1597	0.000E+00	0.0000	1.308E-12	0.0000
Pb-210	3.196E-12	0.0000	4.924E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.879E-07	0.3466	0.000E+00	0.0000	1.250E-11	0.0000
Ra-226	7.342E-08	0.1354	6.007E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.844E-07	0.3402	0.000E+00	0.0000	4.130E-12	0.0000
Th-230	1.278E-10	0.0002	6.315E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.921E-10	0.0007	0.000E+00	0.0000	5.070E-13	0.0000
U-234	9.210E-14	0.0000	5.078E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.211E-10	0.0011	0.000E+00	0.0000	3.956E-13	0.0000
U-235	1.042E-09	0.0019	4.569E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.422E-10	0.0012	0.000E+00	0.0000	4.046E-13	0.0000
U-238	5.935E-10	0.0011	4.317E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.844E-10	0.0014	0.000E+00	0.0000	4.996E-13	0.0000
Total	8.054E-08	0.1486	8.322E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.615E-07	0.8514	0.000E+00	0.0000	2.202E-11	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.540E-09	0.0084
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.760E-08	0.1616
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.879E-07	0.3466
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.578E-07	0.4756
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.211E-10	0.0010
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.221E-10	0.0011
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.685E-09	0.0031
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.379E-09	0.0025
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.421E-07	1.0000

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

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

	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways				
Radio-Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	2.265E-06	0.000E+00	1.738E-01	0.000E+00	5.137E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.743E-01
Pa-231	2.296E-06	0.000E+00	6.367E+01	0.000E+00	5.207E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.367E+01
Pb-210	2.317E-06	0.000E+00	1.035E+01	0.000E+00	5.255E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.035E+01
Ra-226	2.318E-06	0.000E+00	5.137E+01	0.000E+00	5.256E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.137E+01
Th-230	2.318E-06	0.000E+00	1.297E-01	0.000E+00	5.256E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.302E-01
U-234	2.296E-06	0.000E+00	1.086E+00	0.000E+00	5.207E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.086E+00
U-235	2.296E-06	0.000E+00	1.086E+00	0.000E+00	5.207E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.086E+00
U-238	2.296E-06	0.000E+00	1.086E+00	0.000E+00	5.207E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.086E+00

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	4.842E-09	0.0089	5.644E-12	0.0000	0.000E+00	0.0000	6.733E-10	0.0012	0.000E+00	0.0000	3.926E-12	0.0000
Pa-231	4.527E-10	0.0008	2.076E-12	0.0000	0.000E+00	0.0000	8.564E-08	0.1580	0.000E+00	0.0000	1.396E-12	0.0000
Pb-210	3.624E-12	0.0000	8.551E-13	0.0000	0.000E+00	0.0000	2.141E-07	0.3950	0.000E+00	0.0000	2.171E-11	0.0000
Ra-226	7.366E-08	0.1359	7.863E-13	0.0000	0.000E+00	0.0000	1.587E-07	0.2930	0.000E+00	0.0000	3.247E-12	0.0000
Th-230	4.377E-13	0.0000	9.455E-13	0.0000	0.000E+00	0.0000	9.361E-11	0.0002	0.000E+00	0.0000	7.504E-13	0.0000
U-234	8.917E-14	0.0000	7.575E-13	0.0000	0.000E+00	0.0000	6.190E-10	0.0011	0.000E+00	0.0000	5.901E-13	0.0000
U-235	1.038E-09	0.0019	6.813E-13	0.0000	0.000E+00	0.0000	6.329E-10	0.0012	0.000E+00	0.0000	6.033E-13	0.0000
U-238	5.909E-10	0.0011	6.439E-13	0.0000	0.000E+00	0.0000	7.818E-10	0.0014	0.000E+00	0.0000	7.452E-13	0.0000
Total	8.059E-08	0.1487	1.239E-11	0.0000	0.000E+00	0.0000	4.612E-07	0.8512	0.000E+00	0.0000	3.296E-11	0.0001

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.525E-09	0.0102
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.609E-08	0.1589
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.141E-07	0.3951
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.324E-07	0.4289
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.574E-11	0.0002
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.205E-10	0.0011
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.672E-09	0.0031
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.374E-09	0.0025
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.419E-07	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground risk	Ground fract.	Inhalation risk	Inhalation fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	Soil risk	Soil fract.
Ac-227	3.998E-09	0.0074	4.584E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.005E-10	0.0004	0.000E+00	0.0000	3.189E-12	0.0000
Pa-231	1.297E-09	0.0024	3.136E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.610E-08	0.1589	0.000E+00	0.0000	2.133E-12	0.0000
Pb-210	3.011E-12	0.0000	6.995E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.767E-07	0.3261	0.000E+00	0.0000	1.776E-11	0.0000
Ra-226	7.347E-08	0.1356	9.394E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.957E-07	0.3611	0.000E+00	0.0000	7.179E-12	0.0000
Th-230	1.917E-10	0.0004	9.479E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.576E-10	0.0010	0.000E+00	0.0000	7.656E-13	0.0000
U-234	9.475E-14	0.0000	7.576E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.190E-10	0.0011	0.000E+00	0.0000	5.901E-13	0.0000
U-235	1.038E-09	0.0019	6.816E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.437E-10	0.0012	0.000E+00	0.0000	6.036E-13	0.0000
U-238	5.909E-10	0.0011	6.439E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.818E-10	0.0014	0.000E+00	0.0000	7.452E-13	0.0000
Total	8.059E-08	0.1487	1.239E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.612E-07	0.8512	0.000E+00	0.0000	3.296E-11	0.0001

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

Water Dependent Pathways

Radio-Nuclide	Water risk	Water fract.	Fish risk	Fish fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	All pathways risk	All pathways fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.206E-09	0.0078
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.740E-08	0.1613
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.767E-07	0.3261
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.691E-07	0.4967
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.510E-10	0.0014
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.205E-10	0.0011
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.683E-09	0.0031
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.374E-09	0.0025
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.419E-07	1.0000

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

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

	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways				
Radio-Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Total Ingestion*
Ac-227	7.191E-06	0.000E+00	1.693E-01	0.000E+00	1.631E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.710E-01
Pa-231	7.486E-06	0.000E+00	6.247E+01	0.000E+00	1.697E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.247E+01
Pb-210	7.721E-06	0.000E+00	1.038E+01	0.000E+00	1.751E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.038E+01
Ra-226	7.726E-06	0.000E+00	5.143E+01	0.000E+00	1.752E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.143E+01
Th-230	7.723E-06	0.000E+00	1.329E-01	0.000E+00	1.751E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.347E-01
U-234	7.486E-06	0.000E+00	1.073E+00	0.000E+00	1.697E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.075E+00
U-235	7.486E-06	0.000E+00	1.073E+00	0.000E+00	1.697E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.075E+00
U-238	7.486E-06	0.000E+00	1.073E+00	0.000E+00	1.697E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.075E+00

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	4.660E-09	0.0086	1.170E-11	0.0000	0.000E+00	0.0000	6.565E-10	0.0012	0.000E+00	0.0000	8.137E-12	0.0000
Pa-231	4.466E-10	0.0008	4.404E-12	0.0000	0.000E+00	0.0000	8.401E-08	0.1552	0.000E+00	0.0000	2.962E-12	0.0000
Pb-210	3.657E-12	0.0000	1.852E-12	0.0000	0.000E+00	0.0000	2.146E-07	0.3965	0.000E+00	0.0000	4.701E-11	0.0001
Ra-226	7.408E-08	0.1369	1.704E-12	0.0000	0.000E+00	0.0000	1.589E-07	0.2936	0.000E+00	0.0000	7.034E-12	0.0000
Th-230	4.435E-13	0.0000	2.048E-12	0.0000	0.000E+00	0.0000	9.590E-11	0.0002	0.000E+00	0.0000	1.625E-12	0.0000
U-234	8.845E-14	0.0000	1.607E-12	0.0000	0.000E+00	0.0000	6.117E-10	0.0011	0.000E+00	0.0000	1.252E-12	0.0000
U-235	1.025E-09	0.0019	1.445E-12	0.0000	0.000E+00	0.0000	6.254E-10	0.0012	0.000E+00	0.0000	1.280E-12	0.0000
U-238	5.817E-10	0.0011	1.366E-12	0.0000	0.000E+00	0.0000	7.726E-10	0.0014	0.000E+00	0.0000	1.581E-12	0.0000
Total	8.080E-08	0.1493	2.612E-11	0.0000	0.000E+00	0.0000	4.603E-07	0.8505	0.000E+00	0.0000	7.088E-11	0.0001

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.337E-09	0.0099
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.447E-08	0.1561
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.147E-07	0.3966
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.330E-07	0.4305
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.000E-10	0.0002
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.147E-10	0.0011
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.654E-09	0.0031
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.357E-09	0.0025
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.412E-07	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground risk	Ground fract.	Inhalation risk	Inhalation fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	Soil risk	Soil fract.
Ac-227	3.053E-09	0.0056	7.605E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.534E-10	0.0003	0.000E+00	0.0000	5.290E-12	0.0000
Pa-231	2.054E-09	0.0038	8.496E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.449E-08	0.1561	0.000E+00	0.0000	5.808E-12	0.0000
Pb-210	2.444E-12	0.0000	1.229E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.425E-07	0.2633	0.000E+00	0.0000	3.120E-11	0.0001
Ra-226	7.366E-08	0.1361	2.315E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.299E-07	0.4249	0.000E+00	0.0000	2.276E-11	0.0000
Th-230	4.164E-10	0.0008	2.059E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.208E-09	0.0022	0.000E+00	0.0000	1.715E-12	0.0000
U-234	1.130E-13	0.0000	1.607E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.118E-10	0.0011	0.000E+00	0.0000	1.252E-12	0.0000
U-235	1.026E-09	0.0019	1.447E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.486E-10	0.0012	0.000E+00	0.0000	1.281E-12	0.0000
U-238	5.817E-10	0.0011	1.366E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.726E-10	0.0014	0.000E+00	0.0000	1.581E-12	0.0000
Total	8.080E-08	0.1493	2.612E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.603E-07	0.8505	0.000E+00	0.0000	7.088E-11	0.0001

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

Water Dependent Pathways

Radio-Nuclide	Water risk	Water fract.	Fish risk	Fish fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	All pathways risk	All pathways fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.219E-09	0.0059
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.656E-08	0.1599
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.425E-07	0.2633
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.036E-07	0.5610
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.628E-09	0.0030
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.148E-10	0.0011
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.677E-09	0.0031
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.357E-09	0.0025
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.412E-07	1.0000

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

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 3.000E+01 years

	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways				
Radio-Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.928E-05	0.000E+00	1.587E-01	0.000E+00	4.371E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.631E-01
Pa-231	2.108E-05	0.000E+00	5.914E+01	0.000E+00	4.780E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.915E+01
Pb-210	2.314E-05	0.000E+00	1.046E+01	0.000E+00	5.248E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.046E+01
Ra-226	2.318E-05	0.000E+00	5.160E+01	0.000E+00	5.255E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.160E+01
Th-230	2.315E-05	0.000E+00	1.421E-01	0.000E+00	5.250E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.474E-01
U-234	2.108E-05	0.000E+00	1.037E+00	0.000E+00	4.780E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.042E+00
U-235	2.108E-05	0.000E+00	1.037E+00	0.000E+00	4.780E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.042E+00
U-238	2.108E-05	0.000E+00	1.037E+00	0.000E+00	4.780E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.042E+00

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

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 3.000E+01 years

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

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

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	4.282E-09	0.0079	2.668E-11	0.0000	0.000E+00	0.0000	6.162E-10	0.0011	0.000E+00	0.0000	1.856E-11	0.0000
Pa-231	4.294E-10	0.0008	1.050E-11	0.0000	0.000E+00	0.0000	7.954E-08	0.1474	0.000E+00	0.0000	7.061E-12	0.0000
Pb-210	3.753E-12	0.0000	4.697E-12	0.0000	0.000E+00	0.0000	2.163E-07	0.4007	0.000E+00	0.0000	1.192E-10	0.0002
Ra-226	7.527E-08	0.1395	4.324E-12	0.0000	0.000E+00	0.0000	1.594E-07	0.2954	0.000E+00	0.0000	1.785E-11	0.0000
Th-230	4.604E-13	0.0000	5.195E-12	0.0000	0.000E+00	0.0000	1.024E-10	0.0002	0.000E+00	0.0000	4.123E-12	0.0000
U-234	8.643E-14	0.0000	3.830E-12	0.0000	0.000E+00	0.0000	5.910E-10	0.0011	0.000E+00	0.0000	2.984E-12	0.0000
U-235	9.901E-10	0.0018	3.445E-12	0.0000	0.000E+00	0.0000	6.043E-10	0.0011	0.000E+00	0.0000	3.050E-12	0.0000
U-238	5.561E-10	0.0010	3.256E-12	0.0000	0.000E+00	0.0000	7.464E-10	0.0014	0.000E+00	0.0000	3.768E-12	0.0000
Total	8.153E-08	0.1511	6.193E-11	0.0001	0.000E+00	0.0000	4.579E-07	0.8485	0.000E+00	0.0000	1.766E-10	0.0003

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.943E-09	0.0092
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.999E-08	0.1482
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.164E-07	0.4010
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.347E-07	0.4349
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.122E-10	0.0002
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.979E-10	0.0011
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.601E-09	0.0030
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.310E-09	0.0024
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.397E-07	1.0000

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

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+01 years

Radionuclides

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

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

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground risk	Ground fract.	Inhalation risk	Inhalation fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	Soil risk	Soil fract.
Ac-227	1.412E-09	0.0026	8.776E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.138E-11	0.0001	0.000E+00	0.0000	6.104E-12	0.0000
Pa-231	3.297E-09	0.0061	2.839E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	8.003E-08	0.1483	0.000E+00	0.0000	1.951E-11	0.0000
Pb-210	1.346E-12	0.0000	1.680E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.707E-08	0.1428	0.000E+00	0.0000	4.266E-11	0.0001
Ra-226	7.420E-08	0.1375	7.255E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.952E-07	0.5470	0.000E+00	0.0000	9.355E-11	0.0002
Th-230	1.068E-09	0.0020	5.280E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.528E-09	0.0065	0.000E+00	0.0000	5.015E-12	0.0000
U-234	2.406E-13	0.0000	3.831E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.915E-10	0.0011	0.000E+00	0.0000	2.985E-12	0.0000
U-235	9.916E-10	0.0018	3.459E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.600E-10	0.0012	0.000E+00	0.0000	3.061E-12	0.0000
U-238	5.561E-10	0.0010	3.256E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.465E-10	0.0014	0.000E+00	0.0000	3.768E-12	0.0000
Total	8.153E-08	0.1511	6.193E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	4.579E-07	0.8485	0.000E+00	0.0000	1.766E-10	0.0003

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

Water Dependent Pathways

Radio-Nuclide	Water risk	Water fract.	Fish risk	Fish fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	All pathways risk	All pathways fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.499E-09	0.0028
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.337E-08	0.1545
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.711E-08	0.1429
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.695E-07	0.6847
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.606E-09	0.0085
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.985E-10	0.0011
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.658E-09	0.0031
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.310E-09	0.0024
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.397E-07	1.0000

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

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

	Water Independent Pathways (Inhalation w/o radon)				Water Dependent Pathways					
Radio-Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	4.926E-05	0.000E+00	1.320E-01	0.000E+00	1.117E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.431E-01
Pa-231	5.631E-05	0.000E+00	4.881E+01	0.000E+00	1.277E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.882E+01
Pb-210	7.706E-05	0.000E+00	1.076E+01	0.000E+00	1.747E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.077E+01
Ra-226	7.723E-05	0.000E+00	5.219E+01	0.000E+00	1.751E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.220E+01
Th-230	7.698E-05	0.000E+00	1.741E-01	0.000E+00	1.746E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.915E-01
U-234	5.631E-05	0.000E+00	9.140E-01	0.000E+00	1.277E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.267E-01
U-235	5.631E-05	0.000E+00	9.140E-01	0.000E+00	1.277E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.267E-01
U-238	5.631E-05	0.000E+00	9.140E-01	0.000E+00	1.277E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.267E-01

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	3.576E-09	0.0067	6.415E-11	0.0001	0.000E+00	0.0000	5.132E-10	0.0010	0.000E+00	0.0000	4.462E-11	0.0001
Pa-231	3.744E-10	0.0007	2.626E-11	0.0000	0.000E+00	0.0000	6.564E-08	0.1222	0.000E+00	0.0000	1.766E-11	0.0000
Pb-210	4.120E-12	0.0000	1.465E-11	0.0000	0.000E+00	0.0000	2.225E-07	0.4141	0.000E+00	0.0000	3.718E-10	0.0007
Ra-226	7.959E-08	0.1481	1.349E-11	0.0000	0.000E+00	0.0000	1.613E-07	0.3001	0.000E+00	0.0000	5.571E-11	0.0001
Th-230	5.247E-13	0.0000	1.617E-11	0.0000	0.000E+00	0.0000	1.253E-10	0.0002	0.000E+00	0.0000	1.284E-11	0.0000
U-234	7.971E-14	0.0000	9.582E-12	0.0000	0.000E+00	0.0000	5.208E-10	0.0010	0.000E+00	0.0000	7.464E-12	0.0000
U-235	8.756E-10	0.0016	8.617E-12	0.0000	0.000E+00	0.0000	5.324E-10	0.0010	0.000E+00	0.0000	7.631E-12	0.0000
U-238	4.752E-10	0.0009	8.145E-12	0.0000	0.000E+00	0.0000	6.577E-10	0.0012	0.000E+00	0.0000	9.426E-12	0.0000
Total	8.490E-08	0.1580	1.611E-10	0.0003	0.000E+00	0.0000	4.517E-07	0.8407	0.000E+00	0.0000	5.271E-10	0.0010

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.198E-09	0.0078
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.606E-08	0.1229
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.229E-07	0.4148
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.409E-07	0.4484
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.548E-10	0.0003
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.379E-10	0.0010
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.424E-09	0.0027
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.151E-09	0.0021
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.373E-07	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground risk	Ground fract.	Inhalation risk	Inhalation fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	Soil risk	Soil fract.
Ac-227	9.518E-11	0.0002	1.706E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.876E-12	0.0000	0.000E+00	0.0000	1.187E-12	0.0000
Pa-231	3.849E-09	0.0072	8.855E-11	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	6.601E-08	0.1228	0.000E+00	0.0000	6.099E-11	0.0001
Pb-210	1.670E-13	0.0000	5.934E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.962E-09	0.0167	0.000E+00	0.0000	1.506E-11	0.0000
Ra-226	7.613E-08	0.1417	2.651E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.609E-07	0.6717	0.000E+00	0.0000	3.986E-10	0.0007
Th-230	3.467E-09	0.0065	1.720E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.399E-08	0.0260	0.000E+00	0.0000	2.666E-11	0.0000
U-234	1.538E-12	0.0000	9.592E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.260E-10	0.0010	0.000E+00	0.0000	7.477E-12	0.0000
U-235	8.822E-10	0.0016	8.777E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.763E-10	0.0013	0.000E+00	0.0000	7.741E-12	0.0000
U-238	4.752E-10	0.0009	8.147E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.579E-10	0.0012	0.000E+00	0.0000	9.429E-12	0.0000
Total	8.490E-08	0.1580	1.611E-10	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	4.517E-07	0.8407	0.000E+00	0.0000	5.271E-10	0.0010

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

Water Dependent Pathways

Radio-Nuclide	Water risk	Water fract.	Fish risk	Fish fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	All pathways risk	All pathways fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.029E-10	0.0002
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.001E-08	0.1303
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.978E-09	0.0167
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.375E-07	0.8142
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.750E-08	0.0326
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.446E-10	0.0010
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.575E-09	0.0029
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.151E-09	0.0021
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.373E-07	1.0000

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

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

	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways				
Radio-Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	7.818E-05	0.000E+00	8.019E-02	0.000E+00	1.773E-02	0.000E+00	0.000E+00	0.000E+00	1.311E-04	0.000E+00	9.805E-02
Pa-231	8.972E-05	0.000E+00	2.808E+01	0.000E+00	2.034E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.810E+01
Pb-210	2.309E-04	0.000E+00	1.163E+01	0.000E+00	5.235E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.168E+01
Ra-226	2.314E-04	0.000E+00	5.384E+01	0.000E+00	5.246E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.389E+01
Th-230	2.291E-04	0.000E+00	2.643E-01	0.000E+00	5.196E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.163E-01
U-234	8.972E-05	0.000E+00	6.115E-01	0.000E+00	2.034E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.318E-01
U-235	8.972E-05	0.000E+00	6.115E-01	0.000E+00	2.034E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.318E-01
U-238	8.972E-05	0.000E+00	6.115E-01	0.000E+00	2.034E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.318E-01

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.389E-09	0.0044	9.989E-11	0.0002	0.000E+00	0.0000	3.118E-10	0.0006	0.000E+00	0.0000	6.949E-11	0.0001
Pa-231	2.530E-10	0.0005	4.104E-11	0.0001	0.000E+00	0.0000	3.775E-08	0.0693	0.000E+00	0.0000	2.760E-11	0.0001
Pb-210	5.388E-12	0.0000	4.302E-11	0.0001	0.000E+00	0.0000	2.405E-07	0.4413	0.000E+00	0.0000	1.092E-09	0.0020
Ra-226	9.335E-08	0.1713	3.964E-11	0.0001	0.000E+00	0.0000	1.664E-07	0.3053	0.000E+00	0.0000	1.636E-10	0.0003
Th-230	7.623E-13	0.0000	4.720E-11	0.0001	0.000E+00	0.0000	1.897E-10	0.0003	0.000E+00	0.0000	3.746E-11	0.0001
U-234	6.327E-14	0.0000	1.497E-11	0.0000	0.000E+00	0.0000	3.481E-10	0.0006	0.000E+00	0.0000	1.166E-11	0.0000
U-235	6.164E-10	0.0011	1.346E-11	0.0000	0.000E+00	0.0000	3.559E-10	0.0007	0.000E+00	0.0000	1.192E-11	0.0000
U-238	3.034E-10	0.0006	1.273E-11	0.0000	0.000E+00	0.0000	4.397E-10	0.0008	0.000E+00	0.0000	1.473E-11	0.0000
Total	9.692E-08	0.1779	3.120E-10	0.0006	0.000E+00	0.0000	4.462E-07	0.8189	0.000E+00	0.0000	1.429E-09	0.0026

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.446E-13	0.0000	0.000E+00	0.0000	2.871E-09	0.0053
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.808E-08	0.0699
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.416E-07	0.4434
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.599E-07	0.4770
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.751E-10	0.0005
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.748E-10	0.0007
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.978E-10	0.0018
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.706E-10	0.0014
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.446E-13	0.0000	0.000E+00	0.0000	5.449E-07	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	4.284E-14	0.0000	1.790E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.188E-15	0.0000	0.000E+00	0.0000	1.245E-15	0.0000
Pa-231	2.627E-09	0.0048	1.401E-10	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	3.782E-08	0.0694	0.000E+00	0.0000	9.650E-11	0.0002
Pb-210	4.301E-16	0.0000	3.434E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.908E-11	0.0000	0.000E+00	0.0000	8.717E-14	0.0000
Ra-226	8.192E-08	0.1503	7.306E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	3.599E-07	0.6606	0.000E+00	0.0000	1.115E-09	0.0020
Th-230	1.142E-08	0.0210	5.671E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	4.703E-08	0.0863	0.000E+00	0.0000	1.777E-10	0.0003
U-234	1.190E-11	0.0000	1.505E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.947E-10	0.0007	0.000E+00	0.0000	1.185E-11	0.0000
U-235	6.320E-10	0.0012	1.431E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.991E-10	0.0011	0.000E+00	0.0000	1.250E-11	0.0000
U-238	3.034E-10	0.0006	1.274E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.400E-10	0.0008	0.000E+00	0.0000	1.474E-11	0.0000
Total	9.692E-08	0.1779	3.120E-10	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	4.462E-07	0.8189	0.000E+00	0.0000	1.429E-09	0.0026

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.119E-15	0.0000	0.000E+00	0.0000	5.118E-14	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.397E-13	0.0000	0.000E+00	0.0000	4.069E-08	0.0747
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.917E-11	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.431E-07	0.8131
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.868E-08	0.1077
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.335E-10	0.0008
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.769E-15	0.0000	0.000E+00	0.0000	1.258E-09	0.0023
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.709E-10	0.0014
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.446E-13	0.0000	0.000E+00	0.0000	5.449E-07	1.0000

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

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

	Water Independent Pathways (Inhalation w/o radon)				Water Dependent Pathways					
Radio-Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	2.845E-05	0.000E+00	1.265E-02	0.000E+00	6.452E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.855E-02	0.000E+00	3.765E-02
Pa-231	3.265E-05	0.000E+00	3.888E+00	0.000E+00	7.404E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.550E+00	0.000E+00	5.445E+00
Pb-210	7.628E-04	0.000E+00	1.461E+01	0.000E+00	1.730E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.048E-06	0.000E+00	1.478E+01
Ra-226	7.642E-04	0.000E+00	5.933E+01	0.000E+00	1.733E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.567E-08	0.000E+00	5.951E+01
Th-230	7.412E-04	0.000E+00	5.678E-01	0.000E+00	1.681E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.017E-06	0.000E+00	7.358E-01
U-234	3.265E-05	0.000E+00	1.149E-01	0.000E+00	7.404E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.054E-01	0.000E+00	2.277E-01
U-235	3.265E-05	0.000E+00	1.149E-01	0.000E+00	7.404E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.054E-01	0.000E+00	2.277E-01
U-238	3.265E-05	0.000E+00	1.149E-01	0.000E+00	7.404E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.054E-01	0.000E+00	2.277E-01

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	5.931E-10	0.0009	3.610E-11	0.0001	0.000E+00	0.0000	4.917E-11	0.0001	0.000E+00	0.0000	2.511E-11	0.0000
Pa-231	6.419E-11	0.0001	1.483E-11	0.0000	0.000E+00	0.0000	5.227E-09	0.0079	0.000E+00	0.0000	9.975E-12	0.0000
Pb-210	1.380E-11	0.0000	1.412E-10	0.0002	0.000E+00	0.0000	3.020E-07	0.4561	0.000E+00	0.0000	3.584E-09	0.0054
Ra-226	1.628E-07	0.2459	1.300E-10	0.0002	0.000E+00	0.0000	1.833E-07	0.2769	0.000E+00	0.0000	5.368E-10	0.0008
Th-230	2.809E-12	0.0000	1.516E-10	0.0002	0.000E+00	0.0000	4.063E-10	0.0006	0.000E+00	0.0000	1.203E-10	0.0002
U-234	2.818E-14	0.0000	5.411E-12	0.0000	0.000E+00	0.0000	6.535E-11	0.0001	0.000E+00	0.0000	4.215E-12	0.0000
U-235	1.807E-10	0.0003	4.866E-12	0.0000	0.000E+00	0.0000	6.682E-11	0.0001	0.000E+00	0.0000	4.309E-12	0.0000
U-238	6.356E-11	0.0001	4.599E-12	0.0000	0.000E+00	0.0000	8.254E-11	0.0001	0.000E+00	0.0000	5.323E-12	0.0000
Total	1.637E-07	0.2473	4.886E-10	0.0007	0.000E+00	0.0000	4.912E-07	0.7419	0.000E+00	0.0000	4.290E-09	0.0065

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser
File : C:\USERS\H5TDERJC\DESKTOP\NFSS\02 - VPH\13 - RISK ASSESSMENT\04 - RESRAD\FINAL\ADOLESCENT TR SUBSURFACE SOIL.RAD

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

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.281E-11	0.0001	0.000E+00	0.0000	7.763E-10	0.0012
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.106E-09	0.0032	0.000E+00	0.0000	7.422E-09	0.0112
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.199E-14	0.0000	0.000E+00	0.0000	3.057E-07	0.4618
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.685E-16	0.0000	0.000E+00	0.0000	3.468E-07	0.5238
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.326E-16	0.0000	0.000E+00	0.0000	6.811E-10	0.0010
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.052E-11	0.0001	0.000E+00	0.0000	1.355E-10	0.0002
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.187E-11	0.0001	0.000E+00	0.0000	3.186E-10	0.0005
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.643E-11	0.0001	0.000E+00	0.0000	2.324E-10	0.0004
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.378E-09	0.0036	0.000E+00	0.0000	6.621E-07	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Adolescent Trespasser
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground risk	Ground fract.	Inhalation risk	Inhalation fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	Soil risk	Soil fract.
Ac-227	8.335E-26	0.0000	5.074E-27	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.219E-27	0.0000	0.000E+00	0.0000	3.529E-27	0.0000
Pa-231	6.438E-10	0.0010	4.989E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	5.165E-09	0.0078	0.000E+00	0.0000	3.437E-11	0.0001
Pb-210	3.746E-25	0.0000	3.832E-24	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.154E-21	0.0000	0.000E+00	0.0000	9.727E-23	0.0000
Ra-226	1.061E-07	0.1603	1.781E-10	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	3.191E-07	0.4820	0.000E+00	0.0000	2.719E-09	0.0041
Th-230	5.654E-08	0.0854	2.441E-10	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	1.663E-07	0.2511	0.000E+00	0.0000	1.519E-09	0.0023
U-234	1.176E-10	0.0002	6.004E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.085E-10	0.0006	0.000E+00	0.0000	7.411E-12	0.0000
U-235	1.942E-10	0.0003	5.915E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.776E-10	0.0003	0.000E+00	0.0000	5.032E-12	0.0000
U-238	6.363E-11	0.0001	4.615E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.292E-11	0.0001	0.000E+00	0.0000	5.337E-12	0.0000
Total	1.637E-07	0.2473	4.886E-10	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	4.912E-07	0.7419	0.000E+00	0.0000	4.290E-09	0.0065

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

Water Dependent Pathways

Radio-Nuclide	Water risk	Water fract.	Fish risk	Fish fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	All pathways risk	All pathways fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.755E-26	0.0000	0.000E+00	0.0000	1.427E-25	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.134E-09	0.0032	0.000E+00	0.0000	8.027E-09	0.0121
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.255E-21	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.281E-07	0.6467
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.246E-07	0.3392
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.037E-11	0.0001	0.000E+00	0.0000	5.998E-10	0.0009
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.076E-10	0.0002	0.000E+00	0.0000	4.903E-10	0.0007
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.660E-11	0.0001	0.000E+00	0.0000	2.331E-10	0.0004
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.378E-09	0.0036	0.000E+00	0.0000	6.621E-07	1.0000

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

Adult Trespasser
RESRAD Output Files

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser
File : C:\USERS\H5TDERJC\DESKTOP\NFSS\02 - VPH\13 - RISK ASSESSMENT\04 - RESRAD\FINAL\TR SURFACE SOIL.RAD

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Part I: Mixture Sums and Single Radionuclide Guidelines

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser
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Dose Conversion Factor (and Related) Parameter Summary
Dose Library: ICRP 72 (Adult)

Menu	Parameter	Current Value#	Base Case*	Parameter Name
A-1	DCF's for external ground radiation, (mrem/yr)/(pCi/g)			
A-1	Ac-227 (Source: ICRP 60)	4.485E-04	4.485E-04	DCF1(1)
A-1	At-218 (Source: ICRP 60)	4.878E-03	4.878E-03	DCF1(2)
A-1	Bi-210 (Source: ICRP 60)	5.476E-03	5.476E-03	DCF1(3)
A-1	Bi-211 (Source: ICRP 60)	2.373E-01	2.373E-01	DCF1(4)
A-1	Bi-214 (Source: ICRP 60)	9.325E+00	9.325E+00	DCF1(5)
A-1	Fr-223 (Source: ICRP 60)	1.813E-01	1.813E-01	DCF1(6)
A-1	Pa-231 (Source: ICRP 60)	1.762E-01	1.762E-01	DCF1(7)
A-1	Pa-234 (Source: ICRP 60)	1.088E+01	1.088E+01	DCF1(8)
A-1	Pa-234m (Source: ICRP 60)	9.867E-02	9.867E-02	DCF1(9)
A-1	Pb-210 (Source: ICRP 60)	1.981E-03	1.981E-03	DCF1(10)
A-1	Pb-211 (Source: ICRP 60)	2.915E-01	2.915E-01	DCF1(11)
A-1	Pb-214 (Source: ICRP 60)	1.243E+00	1.243E+00	DCF1(12)
A-1	Po-210 (Source: ICRP 60)	4.934E-05	4.934E-05	DCF1(13)
A-1	Po-211 (Source: ICRP 60)	4.485E-02	4.485E-02	DCF1(14)
A-1	Po-214 (Source: ICRP 60)	4.840E-04	4.840E-04	DCF1(15)
A-1	Po-215 (Source: ICRP 60)	9.456E-04	9.456E-04	DCF1(16)
A-1	Po-218 (Source: ICRP 60)	5.326E-05	5.326E-05	DCF1(17)
A-1	Ra-223 (Source: ICRP 60)	5.532E-01	5.532E-01	DCF1(18)
A-1	Ra-226 (Source: ICRP 60)	2.915E-02	2.915E-02	DCF1(19)
A-1	Rn-219 (Source: ICRP 60)	2.859E-01	2.859E-01	DCF1(20)
A-1	Rn-222 (Source: ICRP 60)	2.186E-03	2.186E-03	DCF1(21)
A-1	Th-227 (Source: ICRP 60)	4.803E-01	4.803E-01	DCF1(22)
A-1	Th-230 (Source: ICRP 60)	1.071E-03	1.071E-03	DCF1(23)
A-1	Th-231 (Source: ICRP 60)	3.214E-02	3.214E-02	DCF1(24)
A-1	Th-234 (Source: ICRP 60)	2.130E-02	2.130E-02	DCF1(25)
A-1	Tl-207 (Source: ICRP 60)	2.299E-02	2.299E-02	DCF1(26)
A-1	Tl-210 (Source: ICRP 60)	1.661E+01	1.661E+01	DCF1(27)
A-1	U-234 (Source: ICRP 60)	3.439E-04	3.439E-04	DCF1(28)
A-1	U-235 (Source: ICRP 60)	6.597E-01	6.597E-01	DCF1(29)
A-1	U-238 (Source: ICRP 60)	7.961E-05	7.961E-05	DCF1(30)
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	2.104E+00	2.035E+00	DCF2(1)
B-1	Pa-231	5.180E-01	5.180E-01	DCF2(2)
B-1	Pb-210+D	3.697E-02	2.072E-02	DCF2(3)
B-1	Ra-226+D	3.526E-02	3.515E-02	DCF2(4)
B-1	Th-230	3.700E-01	3.700E-01	DCF2(5)
B-1	U-234	3.478E-02	3.478E-02	DCF2(6)
B-1	U-235+D	3.145E-02	3.145E-02	DCF2(7)
B-1	U-238	2.960E-02	2.960E-02	DCF2(8)
B-1	U-238+D	2.963E-02	2.960E-02	DCF2(9)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	4.473E-03	4.070E-03	DCF3(1)
D-1	Pa-231	2.627E-03	2.627E-03	DCF3(2)
D-1	Pb-210+D	6.998E-03	2.553E-03	DCF3(3)
D-1	Ra-226+D	1.037E-03	1.036E-03	DCF3(4)
D-1	Th-230	7.770E-04	7.770E-04	DCF3(5)
D-1	U-234	1.813E-04	1.813E-04	DCF3(6)

Dose Conversion Factor (and Related) Parameter Summary (continued)
Dose Library: ICRP 72 (Adult)

Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-1	U-235+D	1.752E-04	1.739E-04	DCF3(7)
D-1	U-238	1.665E-04	1.665E-04	DCF3(8)
D-1	U-238+D	1.791E-04	1.665E-04	DCF3(9)
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	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(2,1)
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(2,2)
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(2,3)
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(3,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(3,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(3,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(4,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(4,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(4,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(5,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(5,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(5,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(6,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(6,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(6,3)
D-34				
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(7,1)
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(7,2)
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(7,3)
D-34				
D-34	U-238 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(8,1)
D-34	U-238 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(8,2)
D-34	U-238 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(8,3)
D-34				
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(9,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(9,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(9,3)
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	Pa-231 , fish	1.000E+01	1.000E+01	BIOFAC(2,1)
D-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(2,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(3,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(3,2)

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser

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Dose Conversion Factor (and Related) Parameter Summary (continued)

Dose Library: ICRP 72 (Adult)

Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(4,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(4,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(5,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(5,2)
D-5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(6,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(6,2)
D-5				
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIOFAC(7,1)
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(7,2)
D-5				
D-5	U-238 , fish	1.000E+01	1.000E+01	BIOFAC(8,1)
D-5	U-238 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(8,2)
D-5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(9,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(9,2)

#For DCF1(xxx) only, factors are for infinite depth & area. See ETFG table in Ground Pathway of Detailed Report.

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

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser

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Site-Specific Parameter Summary

Menu	Parameter	User Input	Used by RESRAD Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.620E+04	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	1.500E-01	2.000E+00	---	THICK0
R011	Fraction of contamination that is submerged	0.000E+00	0.000E+00	---	SUBMFRACT
R011	Length parallel to aquifer flow (m)	1.000E+02	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Ac-227	1.000E+00	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g): Pa-231	1.000E+00	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Pb-210	1.000E+00	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): Ra-226	1.000E+00	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Th-230	1.000E+00	0.000E+00	---	S1(5)
R012	Initial principal radionuclide (pCi/g): U-234	1.000E+00	0.000E+00	---	S1(6)
R012	Initial principal radionuclide (pCi/g): U-235	1.000E+00	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): U-238	1.000E+00	0.000E+00	---	S1(8)
R012	Concentration in groundwater (pCi/L): Ac-227	not used	0.000E+00	---	W1(1)
R012	Concentration in groundwater (pCi/L): Pa-231	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Pb-210	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	W1(4)
R012	Concentration in groundwater (pCi/L): Th-230	not used	0.000E+00	---	W1(5)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(6)
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	---	W1(7)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(8)
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)	1.700E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	6.000E-05	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.200E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	3.600E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	6.840E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	1.040E+01	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	4.400E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	9.000E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	4.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.000E+06	1.000E+06	---	WAREA

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser
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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	4.000E-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)	1.000E+02	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	---	HGWT
R014	Saturated zone b parameter	5.300E+00	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	1.000E-03	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	---	UW
R015	Number of unsaturated zone strata	1	1	---	NS
R015	Unsat. zone 1, thickness (m)	4.000E+00	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.500E+00	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	4.000E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	2.000E-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	5.300E+00	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for 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	7.179E-02	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for Pa-231				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.890E-02	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Pb-210				
R016	Contaminated zone (cm**3/g)	2.100E+03	1.000E+02	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	2.100E+03	1.000E+02	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	2.100E+03	1.000E+02	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	6.909E-04	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	3.800E+04	7.000E+01	---	DCNUCC(4)
R016	Unsaturated zone 1 (cm**3/g)	3.800E+04	7.000E+01	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	3.800E+04	7.000E+01	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.818E-05	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Th-230				
R016	Contaminated zone (cm**3/g)	4.500E+03	6.000E+04	---	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	4.500E+03	6.000E+04	---	DCNUCU(5,1)
R016	Saturated zone (cm**3/g)	4.500E+03	6.000E+04	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.224E-04	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(6)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.890E-02	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R016	Distribution coefficients for U-235				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(7)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(7,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.890E-02	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(8)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(8,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.890E-02	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R017	Inhalation rate (m**3/yr)	2.000E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	2.000E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	1.000E+00	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	1.200E-02	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)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	1.402E+02	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	not used	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	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	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	not used	-1	---	FPLANT
R018	Contamination fraction of meat	1.620E-01	-1	---	FMEAT
R018	Contamination fraction of milk	not used	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	6.800E+01	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	5.000E+01	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	not used	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	not used	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	0.000E+00	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	0.000E+00	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	1.100E+00	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	not used	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	8.000E-02	8.000E-02	---	TE(3)

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser
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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	not used	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	1.000E+00	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	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)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
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	0.000E+00	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

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	257	---	---	KYMAX

Summary of Pathway Selections

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

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser

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Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	16200.00 square meters	Ac-227	1.000E+00
Thickness:	0.15 meters	Pa-231	1.000E+00
Cover Depth:	0.00 meters	Pb-210	1.000E+00
		Ra-226	1.000E+00
		Th-230	1.000E+00
		U-234	1.000E+00
		U-235	1.000E+00
		U-238	1.000E+00

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):	4.400E-01	4.324E-01	4.181E-01	3.761E-01	3.004E-01	2.190E-01	1.943E-01	1.412E-01
M(t):	1.760E-02	1.730E-02	1.672E-02	1.504E-02	1.202E-02	8.762E-03	7.770E-03	5.649E-03

Maximum TDOSE(t): 4.400E-01 mrem/yr at t = 0.000E+00 years

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Ac-227	1.985E-02	0.0451	3.859E-03	0.0088	0.000E+00	0.0000	0.000E+00	0.0000	1.023E-03	0.0023	0.000E+00	0.0000	1.861E-03	0.0042
Pa-231	2.265E-03	0.0051	1.048E-03	0.0024	0.000E+00	0.0000	0.000E+00	0.0000	1.811E-01	0.4116	0.000E+00	0.0000	1.164E-03	0.0026
Pb-210	8.580E-05	0.0002	7.028E-05	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	7.675E-02	0.1744	0.000E+00	0.0000	3.016E-03	0.0069
Ra-226	1.096E-01	0.2490	6.917E-05	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	2.376E-02	0.0540	0.000E+00	0.0000	5.011E-04	0.0011
Th-230	3.616E-05	0.0001	7.144E-04	0.0016	0.000E+00	0.0000	0.000E+00	0.0000	9.067E-04	0.0021	0.000E+00	0.0000	3.403E-04	0.0008
U-234	3.961E-06	0.0000	6.621E-05	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	7.301E-04	0.0017	0.000E+00	0.0000	7.826E-05	0.0002
U-235	7.784E-03	0.0177	5.988E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	7.071E-04	0.0016	0.000E+00	0.0000	7.562E-05	0.0002
U-238	1.670E-03	0.0038	5.640E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	7.212E-04	0.0016	0.000E+00	0.0000	7.730E-05	0.0002
Total	1.412E-01	0.3210	5.944E-03	0.0135	0.000E+00	0.0000	0.000E+00	0.0000	2.857E-01	0.6493	0.000E+00	0.0000	7.113E-03	0.0162

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 mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.659E-02	0.0604
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.856E-01	0.4218
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.992E-02	0.1816
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.339E-01	0.3043
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.998E-03	0.0045
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.785E-04	0.0020
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.627E-03	0.0196
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.525E-03	0.0057
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.400E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 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.
Ac-227	1.789E-02	0.0414	3.478E-03	0.0080	0.000E+00	0.0000	0.000E+00	0.0000	9.224E-04	0.0021	0.000E+00	0.0000	1.677E-03	0.0039
Pa-231	2.792E-03	0.0065	1.133E-03	0.0026	0.000E+00	0.0000	0.000E+00	0.0000	1.759E-01	0.4069	0.000E+00	0.0000	1.186E-03	0.0027
Pb-210	8.312E-05	0.0002	6.806E-05	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	7.432E-02	0.1719	0.000E+00	0.0000	2.921E-03	0.0068
Ra-226	1.095E-01	0.2532	7.126E-05	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	2.609E-02	0.0603	0.000E+00	0.0000	5.929E-04	0.0014
Th-230	8.358E-05	0.0002	7.139E-04	0.0017	0.000E+00	0.0000	0.000E+00	0.0000	9.168E-04	0.0021	0.000E+00	0.0000	3.403E-04	0.0008
U-234	3.849E-06	0.0000	6.430E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	7.091E-04	0.0016	0.000E+00	0.0000	7.600E-05	0.0002
U-235	7.562E-03	0.0175	5.817E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	6.904E-04	0.0016	0.000E+00	0.0000	7.346E-05	0.0002
U-238	1.622E-03	0.0038	5.477E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	7.004E-04	0.0016	0.000E+00	0.0000	7.507E-05	0.0002
Total	1.395E-01	0.3227	5.641E-03	0.0130	0.000E+00	0.0000	0.000E+00	0.0000	2.803E-01	0.6482	0.000E+00	0.0000	6.941E-03	0.0161

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.397E-02	0.0554
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.811E-01	0.4187
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.739E-02	0.1790
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.362E-01	0.3151
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.055E-03	0.0048
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.532E-04	0.0020
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.384E-03	0.0194
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.452E-03	0.0057
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.324E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 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.
Ac-227	1.454E-02	0.0348	2.825E-03	0.0068	0.000E+00	0.0000	0.000E+00	0.0000	7.492E-04	0.0018	0.000E+00	0.0000	1.362E-03	0.0033
Pa-231	3.634E-03	0.0087	1.262E-03	0.0030	0.000E+00	0.0000	0.000E+00	0.0000	1.660E-01	0.3970	0.000E+00	0.0000	1.212E-03	0.0029
Pb-210	7.800E-05	0.0002	6.381E-05	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	6.968E-02	0.1667	0.000E+00	0.0000	2.739E-03	0.0066
Ra-226	1.094E-01	0.2616	7.523E-05	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	3.051E-02	0.0730	0.000E+00	0.0000	7.675E-04	0.0018
Th-230	1.783E-04	0.0004	7.130E-04	0.0017	0.000E+00	0.0000	0.000E+00	0.0000	9.400E-04	0.0022	0.000E+00	0.0000	3.404E-04	0.0008
U-234	3.635E-06	0.0000	6.066E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	6.687E-04	0.0016	0.000E+00	0.0000	7.168E-05	0.0002
U-235	7.137E-03	0.0171	5.491E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	6.581E-04	0.0016	0.000E+00	0.0000	6.933E-05	0.0002
U-238	1.531E-03	0.0037	5.165E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	6.605E-04	0.0016	0.000E+00	0.0000	7.080E-05	0.0002
Total	1.365E-01	0.3264	5.106E-03	0.0122	0.000E+00	0.0000	0.000E+00	0.0000	2.699E-01	0.6455	0.000E+00	0.0000	6.632E-03	0.0159

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.948E-02	0.0466
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.721E-01	0.4116
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.257E-02	0.1736
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.407E-01	0.3366
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.172E-03	0.0052
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.047E-04	0.0019
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.920E-03	0.0189
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.314E-03	0.0055
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.181E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser
File : C:\USERS\H5TDERJC\DESKTOP\NFSS\02 - VPH\13 - RISK ASSESSMENT\04 - RESRAD\FINAL\TR SURFACE SOIL.RAD

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	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.
Ac-227	7.038E-03	0.0187	1.364E-03	0.0036	0.000E+00	0.0000	0.000E+00	0.0000	3.617E-04	0.0010	0.000E+00	0.0000	6.575E-04	0.0017
Pa-231	5.027E-03	0.0134	1.427E-03	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	1.353E-01	0.3597	0.000E+00	0.0000	1.179E-03	0.0031
Pb-210	6.244E-05	0.0002	5.095E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	5.563E-02	0.1479	0.000E+00	0.0000	2.186E-03	0.0058
Ra-226	1.089E-01	0.2897	8.716E-05	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	4.386E-02	0.1166	0.000E+00	0.0000	1.295E-03	0.0034
Th-230	5.082E-04	0.0014	7.096E-04	0.0019	0.000E+00	0.0000	0.000E+00	0.0000	1.048E-03	0.0028	0.000E+00	0.0000	3.418E-04	0.0009
U-234	2.989E-06	0.0000	4.945E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	5.448E-04	0.0014	0.000E+00	0.0000	5.841E-05	0.0002
U-235	5.829E-03	0.0155	4.491E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	5.561E-04	0.0015	0.000E+00	0.0000	5.663E-05	0.0002
U-238	1.250E-03	0.0033	4.208E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	5.381E-04	0.0014	0.000E+00	0.0000	5.767E-05	0.0002
Total	1.287E-01	0.3421	3.775E-03	0.0100	0.000E+00	0.0000	0.000E+00	0.0000	2.378E-01	0.6324	0.000E+00	0.0000	5.832E-03	0.0155

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.420E-03	0.0250
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.429E-01	0.3800
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.793E-02	0.1540
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.542E-01	0.4100
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.608E-03	0.0069
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.556E-04	0.0017
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.487E-03	0.0172
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.888E-03	0.0050
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.761E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 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.
Ac-227	8.849E-04	0.0029	1.703E-04	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	4.516E-05	0.0002	0.000E+00	0.0000	8.210E-05	0.0003
Pa-231	4.119E-03	0.0137	1.045E-03	0.0035	0.000E+00	0.0000	0.000E+00	0.0000	7.533E-02	0.2507	0.000E+00	0.0000	7.769E-04	0.0026
Pb-210	3.306E-05	0.0001	2.677E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	2.923E-02	0.0973	0.000E+00	0.0000	1.149E-03	0.0038
Ra-226	1.077E-01	0.3585	1.088E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	6.836E-02	0.2275	0.000E+00	0.0000	2.265E-03	0.0075
Th-230	1.438E-03	0.0048	7.001E-04	0.0023	0.000E+00	0.0000	0.000E+00	0.0000	1.528E-03	0.0051	0.000E+00	0.0000	3.526E-04	0.0012
U-234	1.816E-06	0.0000	2.761E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	3.033E-04	0.0010	0.000E+00	0.0000	3.255E-05	0.0001
U-235	3.270E-03	0.0109	2.540E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	3.414E-04	0.0011	0.000E+00	0.0000	3.183E-05	0.0001
U-238	7.002E-04	0.0023	2.342E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	2.995E-04	0.0010	0.000E+00	0.0000	3.210E-05	0.0001
Total	1.182E-01	0.3933	2.127E-03	0.0071	0.000E+00	0.0000	0.000E+00	0.0000	1.754E-01	0.5839	0.000E+00	0.0000	4.722E-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 = 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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.182E-03	0.0039
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.127E-02	0.2705
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.044E-02	0.1013
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.784E-01	0.5939
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.019E-03	0.0134
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.653E-04	0.0012
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.668E-03	0.0122
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.055E-03	0.0035
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.004E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser
File : C:\USERS\H5TDERJC\DESKTOP\NFSS\02 - VPH\13 - RISK ASSESSMENT\04 - RESRAD\FINAL\TR SURFACE SOIL.RAD

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	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.
Ac-227	6.235E-07	0.0000	1.171E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.105E-08	0.0000	0.000E+00	0.0000	5.644E-08	0.0000
Pa-231	5.912E-04	0.0027	1.433E-04	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	9.670E-03	0.0441	0.000E+00	0.0000	1.042E-04	0.0005
Pb-210	3.572E-06	0.0000	2.813E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.072E-03	0.0140	0.000E+00	0.0000	1.207E-04	0.0006
Ra-226	1.034E-01	0.4721	1.245E-04	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	8.850E-02	0.4040	0.000E+00	0.0000	3.082E-03	0.0141
Th-230	4.545E-03	0.0207	6.682E-04	0.0031	0.000E+00	0.0000	0.000E+00	0.0000	3.903E-03	0.0178	0.000E+00	0.0000	4.191E-04	0.0019
U-234	1.184E-06	0.0000	3.730E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.980E-05	0.0002	0.000E+00	0.0000	4.289E-06	0.0000
U-235	4.323E-04	0.0020	3.475E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.821E-05	0.0003	0.000E+00	0.0000	4.244E-06	0.0000
U-238	9.214E-05	0.0004	3.011E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.850E-05	0.0002	0.000E+00	0.0000	4.127E-06	0.0000
Total	1.091E-01	0.4979	9.491E-04	0.0043	0.000E+00	0.0000	0.000E+00	0.0000	1.053E-01	0.4807	0.000E+00	0.0000	3.739E-03	0.0171

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.281E-07	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.051E-02	0.0480
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.199E-03	0.0146
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.951E-01	0.8908
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.535E-03	0.0435
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.901E-05	0.0002
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.982E-04	0.0023
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.378E-04	0.0006
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.190E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser
File : C:\USERS\H5TDERJC\DESKTOP\NFSS\02 - VPH\13 - RISK ASSESSMENT\04 - RESRAD\FINAL\TR SURFACE SOIL.RAD

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	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.
Ac-227	6.139E-16	0.0000	1.071E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.842E-17	0.0000	0.000E+00	0.0000	5.166E-17	0.0000
Pa-231	1.795E-06	0.0000	4.045E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.728E-05	0.0001	0.000E+00	0.0000	2.939E-07	0.0000
Pb-210	6.186E-09	0.0000	4.483E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.895E-06	0.0000	0.000E+00	0.0000	1.924E-07	0.0000
Ra-226	9.167E-02	0.4719	1.062E-04	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	7.637E-02	0.3931	0.000E+00	0.0000	2.671E-03	0.0137
Th-230	1.220E-02	0.0628	5.825E-04	0.0030	0.000E+00	0.0000	0.000E+00	0.0000	1.002E-02	0.0516	0.000E+00	0.0000	5.928E-04	0.0031
U-234	3.404E-06	0.0000	1.930E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.902E-06	0.0000	0.000E+00	0.0000	1.858E-07	0.0000
U-235	1.331E-06	0.0000	1.156E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.806E-07	0.0000	0.000E+00	0.0000	1.327E-08	0.0000
U-238	2.802E-07	0.0000	8.553E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.094E-07	0.0000	0.000E+00	0.0000	1.171E-08	0.0000
Total	1.039E-01	0.5347	6.893E-04	0.0035	0.000E+00	0.0000	0.000E+00	0.0000	8.643E-02	0.4449	0.000E+00	0.0000	3.264E-03	0.0168

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.665E-10	0.0000	0.000E+00	0.0000	6.665E-10	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.866E-07	0.0000	0.000E+00	0.0000	3.006E-05	0.0002
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.098E-06	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.708E-01	0.8793
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.340E-02	0.1204
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.685E-06	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.956E-10	0.0000	0.000E+00	0.0000	1.638E-06	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.098E-07	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.882E-07	0.0000	0.000E+00	0.0000	1.943E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser
File : C:\USERS\H5TDERJC\DESKTOP\NFSS\02 - VPH\13 - RISK ASSESSMENT\04 - RESRAD\FINAL\TR SURFACE SOIL.RAD

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pa-231	2.642E-15	0.0000	4.458E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.007E-14	0.0000	0.000E+00	0.0000	3.240E-16	0.0000
Pb-210	1.316E-18	0.0000	6.696E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.312E-16	0.0000	0.000E+00	0.0000	2.874E-17	0.0000
Ra-226	5.693E-02	0.4031	5.203E-05	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	3.743E-02	0.2650	0.000E+00	0.0000	1.309E-03	0.0093
Th-230	2.650E-02	0.1876	3.315E-04	0.0023	0.000E+00	0.0000	0.000E+00	0.0000	1.734E-02	0.1228	0.000E+00	0.0000	7.375E-04	0.0052
U-234	8.076E-06	0.0001	1.042E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.285E-06	0.0000	0.000E+00	0.0000	2.261E-07	0.0000
U-235	2.075E-15	0.0000	1.958E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.625E-16	0.0000	0.000E+00	0.0000	1.968E-17	0.0000
U-238	7.741E-10	0.0000	1.032E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.066E-10	0.0000	0.000E+00	0.0000	2.181E-11	0.0000
Total	8.344E-02	0.5908	3.836E-04	0.0027	0.000E+00	0.0000	0.000E+00	0.0000	5.478E-02	0.3879	0.000E+00	0.0000	2.047E-03	0.0145

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.582E-04	0.0040	0.000E+00	0.0000	5.582E-04	0.0040
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.619E-16	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.573E-02	0.6778
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.491E-02	0.3180
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.617E-06	0.0000	0.000E+00	0.0000	1.631E-05	0.0001
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.447E-05	0.0001	0.000E+00	0.0000	1.447E-05	0.0001
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.598E-06	0.0000	0.000E+00	0.0000	2.599E-06	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.778E-04	0.0041	0.000E+00	0.0000	1.412E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser
File : C:\USERS\H5TDERJC\DESKTOP\NFSS\02 - VPH\13 - RISK ASSESSMENT\04 - RESRAD\FINAL\TR SURFACE SOIL.RAD

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

Parent (i)	Product (j)	Thread Fraction	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g) 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-227+D	Ac-227+D	1.000E+00	2.659E-02	2.397E-02	1.948E-02	9.420E-03	1.182E-03	8.281E-07	6.665E-10	1.210E-31
Pa-231	Pa-231	1.000E+00	1.847E-01	1.793E-01	1.691E-01	1.377E-01	7.663E-02	9.838E-03	2.778E-05	5.473E-04
Pa-231	Ac-227+D	1.000E+00	9.488E-04	1.725E-03	2.965E-03	5.176E-03	4.634E-03	6.709E-04	2.284E-06	1.091E-05
Pa-231	äDSR(j)		1.856E-01	1.811E-01	1.721E-01	1.429E-01	8.127E-02	1.051E-02	3.006E-05	5.582E-04
Pb-210+D	Pb-210+D	1.000E+00	7.992E-02	7.739E-02	7.257E-02	5.793E-02	3.044E-02	3.199E-03	5.098E-06	7.619E-16
Ra-226+D	Ra-226+D	1.000E+00	1.325E-01	1.324E-01	1.323E-01	1.317E-01	1.300E-01	1.244E-01	1.091E-01	6.548E-02
Ra-226+D	Pb-210+D	1.000E+00	1.371E-03	3.816E-03	8.464E-03	2.251E-02	4.842E-02	7.076E-02	6.168E-02	3.025E-02
Ra-226+D	äDSR(j)		1.339E-01	1.362E-01	1.407E-01	1.542E-01	1.784E-01	1.951E-01	1.708E-01	9.573E-02
Th-230	Th-230	1.000E+00	1.969E-03	1.968E-03	1.965E-03	1.955E-03	1.926E-03	1.829E-03	1.570E-03	8.513E-04
Th-230	Ra-226+D	1.000E+00	2.821E-05	8.556E-05	2.001E-04	5.989E-04	1.721E-03	5.452E-03	1.451E-02	3.046E-02
Th-230	Pb-210+D	1.000E+00	2.035E-07	1.330E-06	6.667E-06	5.431E-05	3.713E-04	2.254E-03	7.316E-03	1.359E-02
Th-230	äDSR(j)		1.998E-03	2.055E-03	2.172E-03	2.608E-03	4.019E-03	9.535E-03	2.340E-02	4.491E-02
U-234	U-234	1.000E+00	8.785E-04	8.532E-04	8.046E-04	6.554E-04	3.648E-04	4.688E-05	1.328E-07	2.615E-06
U-234	Th-230	1.000E+00	9.859E-09	2.706E-08	5.990E-08	1.604E-07	3.535E-07	5.438E-07	4.947E-07	2.684E-07
U-234	Ra-226+D	1.000E+00	8.340E-11	5.869E-10	3.062E-09	2.568E-08	1.804E-07	1.155E-06	4.048E-06	9.285E-06
U-234	Pb-210+D	1.000E+00	4.675E-13	6.498E-12	7.064E-11	1.640E-09	2.955E-08	4.261E-07	2.010E-06	4.140E-06
U-234	äDSR(j)		8.785E-04	8.532E-04	8.047E-04	6.556E-04	3.653E-04	4.901E-05	6.685E-06	1.631E-05
U-235+D	U-235+D	1.000E+00	8.625E-03	8.379E-03	7.907E-03	6.456E-03	3.617E-03	4.761E-04	1.447E-06	2.534E-06
U-235+D	Pa-231	1.000E+00	1.751E-06	5.491E-06	1.234E-05	3.045E-05	4.938E-05	2.093E-05	1.771E-07	1.171E-05
U-235+D	Ac-227+D	1.000E+00	8.049E-09	3.602E-08	1.318E-07	6.877E-07	2.066E-06	1.247E-06	1.319E-08	2.272E-07
U-235+D	äDSR(j)		8.627E-03	8.384E-03	7.920E-03	6.487E-03	3.668E-03	4.982E-04	1.638E-06	1.447E-05
U-238	U-238	5.400E-05	4.318E-08	4.194E-08	3.955E-08	3.222E-08	1.793E-08	2.305E-09	6.530E-12	1.301E-10
U-238+D	U-238+D	9.999E-01	2.525E-03	2.452E-03	2.314E-03	1.888E-03	1.055E-03	1.378E-04	4.091E-07	2.591E-06
U-238+D	U-234	9.999E-01	1.239E-09	3.622E-09	7.978E-09	1.950E-08	3.154E-08	1.336E-08	1.132E-10	7.428E-09
U-238+D	Th-230	9.999E-01	9.728E-15	6.128E-14	2.990E-13	2.283E-12	1.311E-11	4.467E-11	4.901E-11	2.697E-11
U-238+D	Ra-226+D	9.999E-01	5.842E-17	8.798E-16	1.006E-14	2.425E-13	4.492E-12	6.827E-11	3.496E-10	8.901E-10
U-238+D	Pb-210+D	9.999E-01	2.693E-19	7.710E-18	1.789E-16	1.193E-14	5.866E-13	2.227E-11	1.701E-10	4.000E-10
U-238+D	äDSR(j)		2.525E-03	2.452E-03	2.314E-03	1.888E-03	1.055E-03	1.378E-04	4.098E-07	2.599E-06

The DSR includes contributions from associated (half-life ó 180 days) daughters.

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser
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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
Ac-227	9.402E+02	1.043E+03	1.284E+03	2.654E+03	2.114E+04	3.019E+07	3.751E+10	*7.232E+13
Pa-231	1.347E+02	1.381E+02	1.453E+02	1.749E+02	3.076E+02	2.379E+03	8.317E+05	4.479E+04
Pb-210	3.128E+02	3.230E+02	3.445E+02	4.315E+02	8.213E+02	7.815E+03	4.903E+06	*7.634E+13
Ra-226	1.867E+02	1.835E+02	1.776E+02	1.621E+02	1.401E+02	1.281E+02	1.464E+02	2.612E+02
Th-230	1.252E+04	1.217E+04	1.151E+04	9.586E+03	6.221E+03	2.622E+03	1.069E+03	5.567E+02
U-234	2.846E+04	2.930E+04	3.107E+04	3.813E+04	6.843E+04	5.101E+05	3.740E+06	1.533E+06
U-235	2.898E+03	2.982E+03	3.157E+03	3.854E+03	6.815E+03	5.018E+04	*2.161E+06	1.728E+06
U-238	9.903E+03	1.019E+04	1.081E+04	1.324E+04	2.369E+04	1.814E+05	*3.361E+05	*3.361E+05

*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) (pCi/g)	G(i,tmin) (pCi/g)	DSR(i,tmax) (pCi/g)	G(i,tmax) (pCi/g)
Ac-227	1.000E+00	0.000E+00	2.659E-02	9.402E+02	2.659E-02	9.402E+02
Pa-231	1.000E+00	0.000E+00	1.856E-01	1.347E+02	1.856E-01	1.347E+02
Pb-210	1.000E+00	0.000E+00	7.992E-02	3.128E+02	7.992E-02	3.128E+02
Ra-226	1.000E+00	88.9 ñ 0.2	1.954E-01	1.280E+02	1.339E-01	1.867E+02
Th-230	1.000E+00	1.000E+03	4.491E-02	5.567E+02	1.998E-03	1.252E+04
U-234	1.000E+00	0.000E+00	8.785E-04	2.846E+04	8.785E-04	2.846E+04
U-235	1.000E+00	0.000E+00	8.627E-03	2.898E+03	8.627E-03	2.898E+03
U-238	1.000E+00	0.000E+00	2.525E-03	9.903E+03	2.525E-03	9.903E+03

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser
File : C:\USERS\H5TDERJC\DESKTOP\NFSS\02 - VPH\13 - RISK ASSESSMENT\04 - RESRAD\FINAL\TR SURFACE SOIL.RAD

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

Nuclide (j)	Parent (i)	THF(i)	DOSE(j,t), mrem/yr t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-227	Ac-227	1.000E+00	2.659E-02	2.397E-02	1.948E-02	9.420E-03	1.182E-03	8.281E-07	6.665E-10	0.000E+00
Ac-227	Pa-231	1.000E+00	9.488E-04	1.725E-03	2.965E-03	5.176E-03	4.634E-03	6.709E-04	2.284E-06	1.091E-05
Ac-227	U-235	1.000E+00	8.049E-09	3.602E-08	1.318E-07	6.877E-07	2.066E-06	1.247E-06	1.319E-08	2.272E-07
Ac-227	äDOSE(j)		2.754E-02	2.569E-02	2.244E-02	1.460E-02	5.819E-03	6.730E-04	2.297E-06	1.114E-05
Pa-231	Pa-231	1.000E+00	1.847E-01	1.793E-01	1.691E-01	1.377E-01	7.663E-02	9.838E-03	2.778E-05	5.473E-04
Pa-231	U-235	1.000E+00	1.751E-06	5.491E-06	1.234E-05	3.045E-05	4.938E-05	2.093E-05	1.771E-07	1.171E-05
Pa-231	äDOSE(j)		1.847E-01	1.793E-01	1.691E-01	1.378E-01	7.668E-02	9.859E-03	2.795E-05	5.590E-04
Pb-210	Pb-210	1.000E+00	7.992E-02	7.739E-02	7.257E-02	5.793E-02	3.044E-02	3.199E-03	5.098E-06	7.619E-16
Pb-210	Ra-226	1.000E+00	1.371E-03	3.816E-03	8.464E-03	2.251E-02	4.842E-02	7.076E-02	6.168E-02	3.025E-02
Pb-210	Th-230	1.000E+00	2.035E-07	1.330E-06	6.667E-06	5.431E-05	3.713E-04	2.254E-03	7.316E-03	1.359E-02
Pb-210	U-234	1.000E+00	4.675E-13	6.498E-12	7.064E-11	1.640E-09	2.955E-08	4.261E-07	2.010E-06	4.140E-06
Pb-210	U-238	9.999E-01	2.693E-19	7.710E-18	1.789E-16	1.193E-14	5.866E-13	2.227E-11	1.701E-10	4.000E-10
Pb-210	äDOSE(j)		8.129E-02	8.121E-02	8.104E-02	8.049E-02	7.923E-02	7.621E-02	6.900E-02	4.385E-02
Ra-226	Ra-226	1.000E+00	1.325E-01	1.324E-01	1.323E-01	1.317E-01	1.300E-01	1.244E-01	1.091E-01	6.548E-02
Ra-226	Th-230	1.000E+00	2.821E-05	8.556E-05	2.001E-04	5.989E-04	1.721E-03	5.452E-03	1.451E-02	3.046E-02
Ra-226	U-234	1.000E+00	8.340E-11	5.869E-10	3.062E-09	2.568E-08	1.804E-07	1.155E-06	4.048E-06	9.285E-06
Ra-226	U-238	9.999E-01	5.842E-17	8.798E-16	1.006E-14	2.425E-13	4.492E-12	6.827E-11	3.496E-10	8.901E-10
Ra-226	äDOSE(j)		1.325E-01	1.325E-01	1.325E-01	1.323E-01	1.317E-01	1.298E-01	1.237E-01	9.595E-02
Th-230	Th-230	1.000E+00	1.969E-03	1.968E-03	1.965E-03	1.955E-03	1.926E-03	1.829E-03	1.570E-03	8.513E-04
Th-230	U-234	1.000E+00	9.859E-09	2.706E-08	5.990E-08	1.604E-07	3.535E-07	5.438E-07	4.947E-07	2.684E-07
Th-230	U-238	9.999E-01	9.728E-15	6.128E-14	2.990E-13	2.283E-12	1.311E-11	4.467E-11	4.901E-11	2.697E-11
Th-230	äDOSE(j)		1.969E-03	1.968E-03	1.965E-03	1.955E-03	1.927E-03	1.830E-03	1.571E-03	8.516E-04
U-234	U-234	1.000E+00	8.785E-04	8.532E-04	8.046E-04	6.554E-04	3.648E-04	4.688E-05	1.328E-07	2.615E-06
U-234	U-238	9.999E-01	1.239E-09	3.622E-09	7.978E-09	1.950E-08	3.154E-08	1.336E-08	1.132E-10	7.428E-09
U-234	äDOSE(j)		8.785E-04	8.532E-04	8.046E-04	6.554E-04	3.648E-04	4.690E-05	1.329E-07	2.623E-06
U-235	U-235	1.000E+00	8.625E-03	8.379E-03	7.907E-03	6.456E-03	3.617E-03	4.761E-04	1.447E-06	2.534E-06
U-238	U-238	5.400E-05	4.318E-08	4.194E-08	3.955E-08	3.222E-08	1.793E-08	2.305E-09	6.530E-12	1.301E-10
U-238	U-238	9.999E-01	2.525E-03	2.452E-03	2.314E-03	1.888E-03	1.055E-03	1.378E-04	4.091E-07	2.591E-06
U-238	äDOSE(j)		2.525E-03	2.452E-03	2.314E-03	1.888E-03	1.055E-03	1.378E-04	4.091E-07	2.591E-06

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

Summary : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser
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Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-227	Ac-227	1.000E+00	1.000E+00	9.016E-01	7.328E-01	3.548E-01	4.466E-02	3.160E-05	3.155E-14	1.401E-45
Ac-227	Pa-231	1.000E+00	0.000E+00	2.980E-02	7.845E-02	1.679E-01	1.599E-01	2.363E-02	7.275E-05	1.176E-13
Ac-227	U-235	1.000E+00	0.000E+00	3.192E-07	2.583E-06	1.996E-05	6.832E-05	4.337E-05	4.425E-07	2.481E-15
Ac-227	äS(j):		1.000E+00	9.314E-01	8.113E-01	5.227E-01	2.047E-01	2.370E-02	7.319E-05	1.201E-13
Pa-231	Pa-231	1.000E+00	1.000E+00	9.715E-01	9.169E-01	7.489E-01	4.200E-01	5.547E-02	1.707E-04	2.760E-13
Pa-231	U-235	1.000E+00	0.000E+00	2.056E-05	5.820E-05	1.585E-04	2.667E-04	1.175E-04	1.087E-06	5.902E-15
Pa-231	äS(j):		1.000E+00	9.715E-01	9.170E-01	7.490E-01	4.202E-01	5.559E-02	1.718E-04	2.819E-13
Pb-210	Pb-210	1.000E+00	1.000E+00	9.687E-01	9.091E-01	7.278E-01	3.855E-01	4.170E-02	7.249E-05	1.588E-14
Pb-210	Ra-226	1.000E+00	0.000E+00	3.059E-02	8.888E-02	2.656E-01	5.962E-01	9.059E-01	8.620E-01	6.198E-01
Pb-210	Th-230	1.000E+00	0.000E+00	6.660E-06	5.867E-05	6.056E-04	4.479E-03	2.866E-02	1.020E-01	2.784E-01
Pb-210	U-234	1.000E+00	0.000E+00	1.990E-11	5.210E-10	1.736E-08	3.510E-07	5.402E-06	2.802E-05	8.474E-05
Pb-210	U-238	9.999E-01	0.000E+00	1.406E-17	1.099E-15	1.197E-13	6.851E-12	2.813E-10	2.371E-09	8.112E-09
Pb-210	äS(j):		1.000E+00	9.993E-01	9.980E-01	9.940E-01	9.862E-01	9.762E-01	9.641E-01	8.982E-01
Ra-226	Ra-226	1.000E+00	1.000E+00	9.995E-01	9.986E-01	9.953E-01	9.860E-01	9.540E-01	8.681E-01	6.241E-01
Ra-226	Th-230	1.000E+00	0.000E+00	4.330E-04	1.298E-03	4.315E-03	1.284E-02	4.162E-02	1.152E-01	2.902E-01
Ra-226	U-234	1.000E+00	0.000E+00	1.931E-09	1.704E-08	1.770E-07	1.330E-06	8.800E-06	3.214E-05	8.845E-05
Ra-226	U-238	9.999E-01	0.000E+00	1.816E-15	4.762E-14	1.595E-12	3.265E-11	5.187E-10	2.775E-09	8.479E-09
Ra-226	äS(j):		1.000E+00	1.000E+00	9.999E-01	9.996E-01	9.988E-01	9.956E-01	9.834E-01	9.144E-01
Th-230	Th-230	1.000E+00	1.000E+00	9.997E-01	9.990E-01	9.967E-01	9.901E-01	9.674E-01	9.054E-01	7.179E-01
Th-230	U-234	1.000E+00	0.000E+00	8.872E-06	2.586E-05	7.804E-05	1.796E-04	2.873E-04	2.852E-04	2.262E-04
Th-230	U-238	9.999E-01	0.000E+00	1.251E-11	1.084E-10	1.054E-09	6.558E-09	2.355E-08	2.826E-08	2.245E-08
Th-230	äS(j):		1.000E+00	9.997E-01	9.990E-01	9.968E-01	9.903E-01	9.677E-01	9.056E-01	7.181E-01
U-234	U-234	1.000E+00	1.000E+00	9.715E-01	9.170E-01	7.490E-01	4.202E-01	5.558E-02	1.717E-04	2.811E-13
U-234	U-238	9.999E-01	0.000E+00	2.754E-06	7.798E-06	2.123E-05	3.574E-05	1.576E-05	1.460E-07	7.980E-16
U-234	äS(j):		1.000E+00	9.715E-01	9.170E-01	7.490E-01	4.202E-01	5.559E-02	1.718E-04	2.819E-13
U-235	U-235	1.000E+00	1.000E+00	9.715E-01	9.170E-01	7.490E-01	4.202E-01	5.559E-02	1.718E-04	2.819E-13
U-238	U-238	5.400E-05	5.400E-05	5.246E-05	4.952E-05	4.045E-05	2.269E-05	3.002E-06	9.277E-09	1.522E-17
U-238	U-238	9.999E-01	9.999E-01	9.715E-01	9.169E-01	7.490E-01	4.202E-01	5.559E-02	1.718E-04	2.819E-13
U-238	äS(j):		1.000E+00	9.715E-01	9.170E-01	7.490E-01	4.202E-01	5.559E-02	1.718E-04	2.819E-13

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

RESCALC.EXE execution time = 2.84 seconds

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser
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Part III: Intake Quantities and Health Risk Factors

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser
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Cancer Risk Slope Factors Summary Table
Risk Library: FGR 13 Morbidity

Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-1	Ground external radiation slope factors, 1/yr per (pCi/g):			
Sf-1	Ac-227+D	1.47E-06	3.48E-10	SLPF(1,1)
Sf-1	Pa-231	1.39E-07	1.39E-07	SLPF(2,1)
Sf-1	Pb-210+D	4.21E-09	1.41E-09	SLPF(3,1)
Sf-1	Ra-226+D	8.49E-06	2.29E-08	SLPF(4,1)
Sf-1	Th-230	8.19E-10	8.19E-10	SLPF(5,1)
Sf-1	U-234	2.52E-10	2.52E-10	SLPF(6,1)
Sf-1	U-235+D	5.43E-07	5.18E-07	SLPF(7,1)
Sf-1	U-238	4.99E-11	4.99E-11	SLPF(8,1)
Sf-1	U-238+D	1.14E-07	4.99E-11	SLPF(9,1)
Sf-2	Inhalation, slope factors, 1/(pCi):			
Sf-2	Ac-227+D	2.13E-07	1.49E-07	SLPF(1,2)
Sf-2	Pa-231	7.62E-08	7.62E-08	SLPF(2,2)
Sf-2	Pb-210+D	3.08E-08	1.58E-08	SLPF(3,2)
Sf-2	Ra-226+D	2.83E-08	2.82E-08	SLPF(4,2)
Sf-2	Th-230	3.40E-08	3.40E-08	SLPF(5,2)
Sf-2	U-234	2.78E-08	2.78E-08	SLPF(6,2)
Sf-2	U-235+D	2.50E-08	2.50E-08	SLPF(7,2)
Sf-2	U-238	2.36E-08	2.36E-08	SLPF(8,2)
Sf-2	U-238+D	2.36E-08	2.36E-08	SLPF(9,2)
Sf-3	Food ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.53E-10	2.45E-10	SLPF(1,3)
Sf-3	Pa-231	2.26E-10	2.26E-10	SLPF(2,3)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF(3,3)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF(4,3)
Sf-3	Th-230	1.19E-10	1.19E-10	SLPF(5,3)
Sf-3	U-234	9.55E-11	9.55E-11	SLPF(6,3)
Sf-3	U-235+D	9.76E-11	9.44E-11	SLPF(7,3)
Sf-3	U-238	8.66E-11	8.66E-11	SLPF(8,3)
Sf-3	U-238+D	1.21E-10	8.66E-11	SLPF(9,3)
Sf-3	Water ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	4.86E-10	2.01E-10	SLPF(1,4)
Sf-3	Pa-231	1.73E-10	1.73E-10	SLPF(2,4)
Sf-3	Pb-210+D	2.66E-09	8.81E-10	SLPF(3,4)
Sf-3	Ra-226+D	3.86E-10	3.85E-10	SLPF(4,4)
Sf-3	Th-230	9.10E-11	9.10E-11	SLPF(5,4)
Sf-3	U-234	7.07E-11	7.07E-11	SLPF(6,4)
Sf-3	U-235+D	7.18E-11	6.96E-11	SLPF(7,4)
Sf-3	U-238	6.40E-11	6.40E-11	SLPF(8,4)
Sf-3	U-238+D	8.71E-11	6.40E-11	SLPF(9,4)
Sf-3	Soil ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.53E-10	2.45E-10	SLPF(1,5)
Sf-3	Pa-231	2.26E-10	2.26E-10	SLPF(2,5)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF(3,5)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF(4,5)
Sf-3	Th-230	1.19E-10	1.19E-10	SLPF(5,5)

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser
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Cancer Risk Slope Factors Summary Table (continued)
Risk Library: FGR 13 Morbidity

Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-3	U-234	9.55E-11	9.55E-11	SLPF(6,5)
Sf-3	U-235+D	9.76E-11	9.44E-11	SLPF(7,5)
Sf-3	U-238	8.66E-11	8.66E-11	SLPF(8,5)
Sf-3	U-238+D	1.21E-10	8.66E-11	SLPF(9,5)
Sf-Rn	Radon Inhalation slope factors, 1/(pCi):			
Sf-Rn	Rn-222	1.80E-12	1.80E-12	SLPFRN(1,1)
Sf-Rn	Po-218	3.70E-12	3.70E-12	SLPFRN(1,2)
Sf-Rn	Pb-214	6.20E-12	6.20E-12	SLPFRN(1,3)
Sf-Rn	Bi-214	1.50E-11	1.50E-11	SLPFRN(1,4)
Sf-Rn	Radon K factors, (mrem/WLM):			
Sf-Rn	Rn-222 Indoor	3.88E+02	3.88E+02	KFACTR(1,1)
Sf-Rn	Rn-222 Outdoor	3.88E+02	3.88E+02	KFACTR(1,2)

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

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser

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Risk Slope and Environmental Transport Factors for the Ground Pathway

Nuclide	Slope(i)*	ETFG(i,t) At Time in Years (dimensionless)							
(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
Ac-227	3.480E-10	1.155E-02	1.155E-02	1.155E-02	1.155E-02	1.154E-02	1.153E-02	1.146E-02	1.089E-02
At-218	3.570E-09	1.169E-02	1.169E-02	1.169E-02	1.169E-02	1.169E-02	1.170E-02	1.171E-02	1.176E-02
Bi-210	2.760E-09	1.155E-02	1.155E-02	1.155E-02	1.155E-02	1.155E-02	1.153E-02	1.147E-02	1.101E-02
Bi-211	1.880E-07	1.111E-02	1.111E-02	1.111E-02	1.111E-02	1.109E-02	1.104E-02	1.087E-02	9.813E-03
Bi-214	7.480E-06	1.023E-02	1.023E-02	1.022E-02	1.022E-02	1.019E-02	1.010E-02	9.828E-03	8.430E-03
Fr-223	1.400E-07	1.139E-02	1.139E-02	1.139E-02	1.139E-02	1.138E-02	1.135E-02	1.124E-02	1.049E-02
Pa-231	1.390E-07	1.121E-02	1.121E-02	1.121E-02	1.121E-02	1.119E-02	1.115E-02	1.099E-02	9.996E-03
Pa-234	8.710E-06	1.061E-02	1.061E-02	1.061E-02	1.060E-02	1.058E-02	1.051E-02	1.027E-02	8.979E-03
Pa-234m	6.870E-08	1.081E-02	1.081E-02	1.081E-02	1.080E-02	1.078E-02	1.072E-02	1.052E-02	9.432E-03
Pb-210	1.410E-09	1.180E-02	1.180E-02	1.180E-02	1.180E-02	1.181E-02	1.181E-02	1.181E-02	1.183E-02
Pb-211	2.290E-07	1.080E-02	1.080E-02	1.080E-02	1.079E-02	1.078E-02	1.071E-02	1.049E-02	9.267E-03
Pb-214	9.820E-07	1.111E-02	1.111E-02	1.111E-02	1.111E-02	1.109E-02	1.104E-02	1.087E-02	9.823E-03
Po-210	3.950E-11	1.060E-02	1.060E-02	1.059E-02	1.059E-02	1.057E-02	1.049E-02	1.025E-02	8.956E-03
Po-211	3.580E-08	1.065E-02	1.065E-02	1.065E-02	1.064E-02	1.062E-02	1.055E-02	1.032E-02	9.051E-03
Po-214	3.860E-10	1.062E-02	1.062E-02	1.062E-02	1.061E-02	1.059E-02	1.052E-02	1.028E-02	9.004E-03
Po-215	7.480E-10	1.097E-02	1.097E-02	1.097E-02	1.096E-02	1.095E-02	1.089E-02	1.069E-02	9.552E-03
Po-218	4.260E-11	1.059E-02	1.059E-02	1.059E-02	1.058E-02	1.056E-02	1.049E-02	1.024E-02	8.943E-03
Ra-223	4.340E-07	1.137E-02	1.137E-02	1.137E-02	1.137E-02	1.136E-02	1.133E-02	1.121E-02	1.039E-02
Ra-226	2.290E-08	1.139E-02	1.139E-02	1.139E-02	1.138E-02	1.137E-02	1.134E-02	1.123E-02	1.043E-02
Rn-219	2.250E-07	1.110E-02	1.110E-02	1.110E-02	1.109E-02	1.108E-02	1.103E-02	1.085E-02	9.787E-03
Rn-222	1.740E-09	1.093E-02	1.093E-02	1.092E-02	1.092E-02	1.090E-02	1.084E-02	1.064E-02	9.466E-03
Th-227	3.780E-07	1.128E-02	1.128E-02	1.128E-02	1.127E-02	1.126E-02	1.122E-02	1.109E-02	1.017E-02
Th-230	8.190E-10	1.161E-02	1.161E-02	1.161E-02	1.161E-02	1.160E-02	1.160E-02	1.157E-02	1.121E-02
Th-231	2.450E-08	1.164E-02	1.164E-02	1.164E-02	1.164E-02	1.164E-02	1.163E-02	1.161E-02	1.129E-02
Th-234	1.630E-08	1.164E-02	1.164E-02	1.164E-02	1.164E-02	1.164E-02	1.164E-02	1.163E-02	1.137E-02
Tl-207	1.520E-08	1.105E-02	1.105E-02	1.105E-02	1.105E-02	1.103E-02	1.098E-02	1.082E-02	9.871E-03
Tl-210	0.000E+00	1.053E-02	1.053E-02	1.053E-02	1.052E-02	1.049E-02	1.041E-02	1.013E-02	8.716E-03
U-234	2.520E-10	1.169E-02	1.169E-02	1.169E-02	1.168E-02	1.168E-02	1.168E-02	1.166E-02	1.139E-02
U-235	5.180E-07	1.140E-02	1.140E-02	1.140E-02	1.140E-02	1.139E-02	1.136E-02	1.125E-02	1.047E-02
U-238	4.990E-11	1.191E-02	1.191E-02	1.191E-02	1.191E-02	1.191E-02	1.191E-02	1.191E-02	1.192E-02

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

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

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways				
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.932E-03	0.000E+00	2.400E-01	0.000E+00	4.380E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.780E-01
Pa-231	1.932E-03	0.000E+00	6.965E+01	0.000E+00	4.380E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.009E+01
Pb-210	1.932E-03	0.000E+00	1.114E+01	0.000E+00	4.380E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.158E+01
Ra-226	1.932E-03	0.000E+00	2.165E+01	0.000E+00	4.380E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.209E+01
Th-230	1.932E-03	0.000E+00	1.161E+00	0.000E+00	4.380E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.599E+00
U-234	1.932E-03	0.000E+00	4.080E+00	0.000E+00	4.380E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.518E+00
U-235	1.932E-03	0.000E+00	4.080E+00	0.000E+00	4.380E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.518E+00
U-238	1.932E-03	0.000E+00	4.080E+00	0.000E+00	4.380E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.518E+00

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.855E-07	0.0549	4.636E-09	0.0014	0.000E+00	0.0000	2.962E-09	0.0009	0.000E+00	0.0000	3.225E-09	0.0010
Pa-231	2.366E-08	0.0070	2.228E-09	0.0007	0.000E+00	0.0000	2.386E-07	0.0707	0.000E+00	0.0000	1.498E-09	0.0004
Pb-210	9.733E-10	0.0003	1.177E-09	0.0003	0.000E+00	0.0000	7.612E-07	0.2255	0.000E+00	0.0000	2.987E-08	0.0088
Ra-226	1.751E-06	0.5187	1.087E-09	0.0003	0.000E+00	0.0000	2.219E-07	0.0657	0.000E+00	0.0000	4.489E-09	0.0013
Th-230	1.895E-10	0.0001	1.304E-09	0.0004	0.000E+00	0.0000	2.744E-09	0.0008	0.000E+00	0.0000	1.035E-09	0.0003
U-234	4.473E-11	0.0000	8.127E-10	0.0002	0.000E+00	0.0000	5.907E-09	0.0017	0.000E+00	0.0000	6.331E-10	0.0002
U-235	9.403E-08	0.0279	7.309E-10	0.0002	0.000E+00	0.0000	6.039E-09	0.0018	0.000E+00	0.0000	6.473E-10	0.0002
U-238	1.877E-08	0.0056	6.908E-10	0.0002	0.000E+00	0.0000	7.460E-09	0.0022	0.000E+00	0.0000	7.995E-10	0.0002
Total	2.075E-06	0.6145	1.267E-08	0.0038	0.000E+00	0.0000	1.247E-06	0.3693	0.000E+00	0.0000	4.220E-08	0.0125

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.963E-07	0.0581
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.660E-07	0.0788
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.932E-07	0.2349
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.979E-06	0.5861
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.273E-09	0.0016
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.397E-09	0.0022
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.015E-07	0.0300
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.772E-08	0.0082
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.376E-06	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground risk	Ground fract.	Inhalation risk	Inhalation fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	Soil risk	Soil fract.
Ac-227	1.383E-07	0.0410	3.459E-09	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	1.324E-09	0.0004	0.000E+00	0.0000	2.406E-09	0.0007
Pa-231	7.082E-08	0.0210	3.405E-09	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	2.402E-07	0.0711	0.000E+00	0.0000	2.317E-09	0.0007
Pb-210	7.245E-10	0.0002	8.762E-10	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	5.659E-07	0.1676	0.000E+00	0.0000	2.224E-08	0.0066
Ra-226	1.744E-06	0.5166	1.382E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	4.156E-07	0.1231	0.000E+00	0.0000	1.207E-08	0.0036
Th-230	7.737E-09	0.0023	1.309E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	4.286E-09	0.0013	0.000E+00	0.0000	1.077E-09	0.0003
U-234	4.514E-11	0.0000	8.128E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	5.907E-09	0.0017	0.000E+00	0.0000	6.331E-10	0.0002
U-235	9.404E-08	0.0279	7.315E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	6.085E-09	0.0018	0.000E+00	0.0000	6.477E-10	0.0002
U-238	1.877E-08	0.0056	6.909E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	7.460E-09	0.0022	0.000E+00	0.0000	7.996E-10	0.0002
Total	2.075E-06	0.6145	1.267E-08	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	1.247E-06	0.3693	0.000E+00	0.0000	4.220E-08	0.0125

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

Water Dependent Pathways

Radio-Nuclide	Water risk	Water fract.	Fish risk	Fish fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	All pathways risk	All pathways fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.455E-07	0.0431
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.168E-07	0.0938
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.898E-07	0.1747
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.173E-06	0.6437
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.441E-08	0.0043
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.398E-09	0.0022
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.015E-07	0.0301
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.772E-08	0.0082
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.376E-06	1.0000

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

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

	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways				
Radio-Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.798E-03	0.000E+00	3.419E-01	0.000E+00	4.078E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.497E-01
Pa-231	1.876E-03	0.000E+00	6.775E+01	0.000E+00	4.254E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.817E+01
Pb-210	1.929E-03	0.000E+00	1.115E+01	0.000E+00	4.375E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.159E+01
Ra-226	1.931E-03	0.000E+00	2.164E+01	0.000E+00	4.378E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.208E+01
Th-230	1.930E-03	0.000E+00	1.161E+00	0.000E+00	4.377E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.598E+00
U-234	1.876E-03	0.000E+00	3.969E+00	0.000E+00	4.254E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.394E+00
U-235	1.876E-03	0.000E+00	3.969E+00	0.000E+00	4.254E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.394E+00
U-238	1.876E-03	0.000E+00	3.969E+00	0.000E+00	4.254E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.394E+00

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.747E-07	0.0521	4.364E-09	0.0013	0.000E+00	0.0000	2.832E-09	0.0008	0.000E+00	0.0000	3.035E-09	0.0009
Pa-231	2.299E-08	0.0069	2.163E-09	0.0006	0.000E+00	0.0000	2.317E-07	0.0691	0.000E+00	0.0000	1.455E-09	0.0004
Pb-210	9.728E-10	0.0003	1.176E-09	0.0004	0.000E+00	0.0000	7.605E-07	0.2269	0.000E+00	0.0000	2.984E-08	0.0089
Ra-226	1.751E-06	0.5224	1.087E-09	0.0003	0.000E+00	0.0000	2.218E-07	0.0662	0.000E+00	0.0000	4.487E-09	0.0013
Th-230	1.894E-10	0.0001	1.303E-09	0.0004	0.000E+00	0.0000	2.742E-09	0.0008	0.000E+00	0.0000	1.034E-09	0.0003
U-234	4.345E-11	0.0000	7.893E-10	0.0002	0.000E+00	0.0000	5.736E-09	0.0017	0.000E+00	0.0000	6.148E-10	0.0002
U-235	9.135E-08	0.0273	7.098E-10	0.0002	0.000E+00	0.0000	5.865E-09	0.0017	0.000E+00	0.0000	6.286E-10	0.0002
U-238	1.823E-08	0.0054	6.709E-10	0.0002	0.000E+00	0.0000	7.244E-09	0.0022	0.000E+00	0.0000	7.765E-10	0.0002
Total	2.060E-06	0.6144	1.226E-08	0.0037	0.000E+00	0.0000	1.238E-06	0.3695	0.000E+00	0.0000	4.187E-08	0.0125

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.849E-07	0.0552
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.583E-07	0.0771
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.925E-07	0.2364
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.979E-06	0.5902
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.269E-09	0.0016
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.184E-09	0.0021
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.856E-08	0.0294
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.692E-08	0.0080
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.352E-06	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser
File : C:\USERS\H5TDERJC\DESKTOP\NFSS\02 - VPH\13 - RISK ASSESSMENT\04 - RESRAD\FINAL\TR SURFACE SOIL.RAD

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

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground risk	Ground fract.	Inhalation risk	Inhalation fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	Soil risk	Soil fract.
Ac-227	1.247E-07	0.0372	3.117E-09	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	1.193E-09	0.0004	0.000E+00	0.0000	2.168E-09	0.0006
Pa-231	7.292E-08	0.0218	3.409E-09	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	2.333E-07	0.0696	0.000E+00	0.0000	2.322E-09	0.0007
Pb-210	7.018E-10	0.0002	8.484E-10	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	5.480E-07	0.1635	0.000E+00	0.0000	2.154E-08	0.0064
Ra-226	1.743E-06	0.5200	1.408E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	4.326E-07	0.1290	0.000E+00	0.0000	1.274E-08	0.0038
Th-230	8.489E-09	0.0025	1.309E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	4.466E-09	0.0013	0.000E+00	0.0000	1.082E-09	0.0003
U-234	4.392E-11	0.0000	7.893E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	5.736E-09	0.0017	0.000E+00	0.0000	6.149E-10	0.0002
U-235	9.136E-08	0.0273	7.105E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	5.914E-09	0.0018	0.000E+00	0.0000	6.290E-10	0.0002
U-238	1.823E-08	0.0054	6.709E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	7.244E-09	0.0022	0.000E+00	0.0000	7.765E-10	0.0002
Total	2.060E-06	0.6144	1.226E-08	0.0037	0.000E+00	0.0000	0.000E+00	0.0000	1.238E-06	0.3695	0.000E+00	0.0000	4.187E-08	0.0125

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

Water Dependent Pathways

Radio-Nuclide	Water risk	Water fract.	Fish risk	Fish fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	All pathways risk	All pathways fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.312E-07	0.0391
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.120E-07	0.0931
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.711E-07	0.1704
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.190E-06	0.6533
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.535E-08	0.0046
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.184E-09	0.0021
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.862E-08	0.0294
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.692E-08	0.0080
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.352E-06	1.0000

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

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

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.565E-03	0.000E+00	3.061E-01	0.000E+00	3.549E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.610E-01
Pa-231	1.769E-03	0.000E+00	6.389E+01	0.000E+00	4.011E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.429E+01
Pb-210	1.925E-03	0.000E+00	1.113E+01	0.000E+00	4.366E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.156E+01
Ra-226	1.929E-03	0.000E+00	2.162E+01	0.000E+00	4.374E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.206E+01
Th-230	1.927E-03	0.000E+00	1.159E+00	0.000E+00	4.371E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.596E+00
U-234	1.769E-03	0.000E+00	3.743E+00	0.000E+00	4.011E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.144E+00
U-235	1.769E-03	0.000E+00	3.743E+00	0.000E+00	4.011E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.144E+00
U-238	1.769E-03	0.000E+00	3.743E+00	0.000E+00	4.011E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.144E+00

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.555E-07	0.0470	3.882E-09	0.0012	0.000E+00	0.0000	2.581E-09	0.0008	0.000E+00	0.0000	2.700E-09	0.0008
Pa-231	2.169E-08	0.0066	2.040E-09	0.0006	0.000E+00	0.0000	2.185E-07	0.0661	0.000E+00	0.0000	1.372E-09	0.0004
Pb-210	9.718E-10	0.0003	1.173E-09	0.0004	0.000E+00	0.0000	7.591E-07	0.2295	0.000E+00	0.0000	2.979E-08	0.0090
Ra-226	1.751E-06	0.5293	1.086E-09	0.0003	0.000E+00	0.0000	2.216E-07	0.0670	0.000E+00	0.0000	4.483E-09	0.0014
Th-230	1.893E-10	0.0001	1.301E-09	0.0004	0.000E+00	0.0000	2.738E-09	0.0008	0.000E+00	0.0000	1.033E-09	0.0003
U-234	4.101E-11	0.0000	7.443E-10	0.0002	0.000E+00	0.0000	5.410E-09	0.0016	0.000E+00	0.0000	5.798E-10	0.0002
U-235	8.622E-08	0.0261	6.694E-10	0.0002	0.000E+00	0.0000	5.531E-09	0.0017	0.000E+00	0.0000	5.928E-10	0.0002
U-238	1.720E-08	0.0052	6.327E-10	0.0002	0.000E+00	0.0000	6.832E-09	0.0021	0.000E+00	0.0000	7.323E-10	0.0002
Total	2.032E-06	0.6145	1.153E-08	0.0035	0.000E+00	0.0000	1.222E-06	0.3696	0.000E+00	0.0000	4.128E-08	0.0125

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.646E-07	0.0498
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.436E-07	0.0737
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.911E-07	0.2392
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.978E-06	0.5980
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.261E-09	0.0016
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.775E-09	0.0020
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.301E-08	0.0281
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.540E-08	0.0077
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.308E-06	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground risk	Ground fract.	Inhalation risk	Inhalation fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	Soil risk	Soil fract.
Ac-227	1.014E-07	0.0307	2.533E-09	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	9.691E-10	0.0003	0.000E+00	0.0000	1.762E-09	0.0005
Pa-231	7.576E-08	0.0229	3.388E-09	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	2.201E-07	0.0665	0.000E+00	0.0000	2.310E-09	0.0007
Pb-210	6.586E-10	0.0002	7.956E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	5.139E-07	0.1554	0.000E+00	0.0000	2.020E-08	0.0061
Ra-226	1.741E-06	0.5264	1.456E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	4.648E-07	0.1405	0.000E+00	0.0000	1.402E-08	0.0042
Th-230	9.990E-09	0.0030	1.308E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	4.848E-09	0.0015	0.000E+00	0.0000	1.092E-09	0.0003
U-234	4.162E-11	0.0000	7.444E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	5.410E-09	0.0016	0.000E+00	0.0000	5.799E-10	0.0002
U-235	8.623E-08	0.0261	6.702E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	5.587E-09	0.0017	0.000E+00	0.0000	5.933E-10	0.0002
U-238	1.720E-08	0.0052	6.327E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	6.832E-09	0.0021	0.000E+00	0.0000	7.323E-10	0.0002
Total	2.032E-06	0.6145	1.153E-08	0.0035	0.000E+00	0.0000	0.000E+00	0.0000	1.222E-06	0.3696	0.000E+00	0.0000	4.128E-08	0.0125

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

Water Dependent Pathways

Radio-Nuclide	Water risk	Water fract.	Fish risk	Fish fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	All pathways risk	All pathways fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.067E-07	0.0322
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.016E-07	0.0912
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.355E-07	0.1619
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.221E-06	0.6716
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.724E-08	0.0052
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.776E-09	0.0020
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.308E-08	0.0281
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.540E-08	0.0077
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.308E-06	1.0000

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

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

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways				
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.006E-03	0.000E+00	2.158E-01	0.000E+00	2.280E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.438E-01
Pa-231	1.441E-03	0.000E+00	5.204E+01	0.000E+00	3.268E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.237E+01
Pb-210	1.912E-03	0.000E+00	1.105E+01	0.000E+00	4.336E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.149E+01
Ra-226	1.923E-03	0.000E+00	2.155E+01	0.000E+00	4.361E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.199E+01
Th-230	1.918E-03	0.000E+00	1.153E+00	0.000E+00	4.348E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.588E+00
U-234	1.441E-03	0.000E+00	3.049E+00	0.000E+00	3.268E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.375E+00
U-235	1.441E-03	0.000E+00	3.049E+00	0.000E+00	3.268E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.375E+00
U-238	1.441E-03	0.000E+00	3.049E+00	0.000E+00	3.268E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.375E+00

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.076E-07	0.0338	2.680E-09	0.0008	0.000E+00	0.0000	1.918E-09	0.0006	0.000E+00	0.0000	1.864E-09	0.0006
Pa-231	1.771E-08	0.0056	1.662E-09	0.0005	0.000E+00	0.0000	1.780E-07	0.0560	0.000E+00	0.0000	1.118E-09	0.0004
Pb-210	9.687E-10	0.0003	1.167E-09	0.0004	0.000E+00	0.0000	7.547E-07	0.2372	0.000E+00	0.0000	2.961E-08	0.0093
Ra-226	1.749E-06	0.5496	1.083E-09	0.0003	0.000E+00	0.0000	2.209E-07	0.0694	0.000E+00	0.0000	4.470E-09	0.0014
Th-230	1.889E-10	0.0001	1.295E-09	0.0004	0.000E+00	0.0000	2.724E-09	0.0009	0.000E+00	0.0000	1.027E-09	0.0003
U-234	3.350E-11	0.0000	6.063E-10	0.0002	0.000E+00	0.0000	4.407E-09	0.0014	0.000E+00	0.0000	4.723E-10	0.0001
U-235	7.041E-08	0.0221	5.453E-10	0.0002	0.000E+00	0.0000	4.505E-09	0.0014	0.000E+00	0.0000	4.829E-10	0.0002
U-238	1.405E-08	0.0044	5.154E-10	0.0002	0.000E+00	0.0000	5.565E-09	0.0017	0.000E+00	0.0000	5.965E-10	0.0002
Total	1.960E-06	0.6159	9.552E-09	0.0030	0.000E+00	0.0000	1.173E-06	0.3686	0.000E+00	0.0000	3.964E-08	0.0125

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.141E-07	0.0358
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.985E-07	0.0624
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.864E-07	0.2472
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.975E-06	0.6208
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.235E-09	0.0016
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.519E-09	0.0017
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.594E-08	0.0239
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.072E-08	0.0065
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.182E-06	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	4.907E-08	0.0154	1.223E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	4.679E-10	0.0001	0.000E+00	0.0000	8.505E-10	0.0003
Pa-231	7.622E-08	0.0240	3.118E-09	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	1.794E-07	0.0564	0.000E+00	0.0000	2.130E-09	0.0007
Pb-210	5.272E-10	0.0002	6.351E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	4.102E-07	0.1289	0.000E+00	0.0000	1.612E-08	0.0051
Ra-226	1.734E-06	0.5450	1.602E-09	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	5.617E-07	0.1766	0.000E+00	0.0000	1.785E-08	0.0056
Th-230	1.522E-08	0.0048	1.306E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	6.382E-09	0.0020	0.000E+00	0.0000	1.135E-09	0.0004
U-234	3.472E-11	0.0000	6.065E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	4.407E-09	0.0014	0.000E+00	0.0000	4.724E-10	0.0001
U-235	7.043E-08	0.0221	5.463E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	4.577E-09	0.0014	0.000E+00	0.0000	4.836E-10	0.0002
U-238	1.405E-08	0.0044	5.154E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	5.565E-09	0.0017	0.000E+00	0.0000	5.965E-10	0.0002
Total	1.960E-06	0.6159	9.552E-09	0.0030	0.000E+00	0.0000	0.000E+00	0.0000	1.173E-06	0.3686	0.000E+00	0.0000	3.964E-08	0.0125

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.161E-08	0.0162
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.609E-07	0.0820
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.275E-07	0.1344
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.315E-06	0.7277
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.404E-08	0.0076
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.520E-09	0.0017
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.604E-08	0.0239
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.072E-08	0.0065
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.182E-06	1.0000

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

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 3.000E+01 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	3.906E-04	0.000E+00	9.900E-02	0.000E+00	8.857E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.876E-01
Pa-231	8.020E-04	0.000E+00	2.896E+01	0.000E+00	1.819E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.915E+01
Pb-210	1.882E-03	0.000E+00	1.088E+01	0.000E+00	4.268E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.130E+01
Ra-226	1.906E-03	0.000E+00	2.136E+01	0.000E+00	4.322E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.180E+01
Th-230	1.890E-03	0.000E+00	1.136E+00	0.000E+00	4.285E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.565E+00
U-234	8.020E-04	0.000E+00	1.697E+00	0.000E+00	1.819E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.879E+00
U-235	8.020E-04	0.000E+00	1.697E+00	0.000E+00	1.819E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.879E+00
U-238	8.020E-04	0.000E+00	1.697E+00	0.000E+00	1.819E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.879E+00

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

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 3.000E+01 years

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

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

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	4.806E-08	0.0162	1.188E-09	0.0004	0.000E+00	0.0000	9.515E-10	0.0003	0.000E+00	0.0000	8.266E-10	0.0003
Pa-231	9.927E-09	0.0033	9.249E-10	0.0003	0.000E+00	0.0000	9.907E-08	0.0334	0.000E+00	0.0000	6.220E-10	0.0002
Pb-210	9.626E-10	0.0003	1.150E-09	0.0004	0.000E+00	0.0000	7.441E-07	0.2508	0.000E+00	0.0000	2.920E-08	0.0098
Ra-226	1.743E-06	0.5876	1.073E-09	0.0004	0.000E+00	0.0000	2.190E-07	0.0738	0.000E+00	0.0000	4.430E-09	0.0015
Th-230	1.876E-10	0.0001	1.276E-09	0.0004	0.000E+00	0.0000	2.685E-09	0.0009	0.000E+00	0.0000	1.012E-09	0.0003
U-234	1.880E-11	0.0000	3.374E-10	0.0001	0.000E+00	0.0000	2.452E-09	0.0008	0.000E+00	0.0000	2.628E-10	0.0001
U-235	3.948E-08	0.0133	3.035E-10	0.0001	0.000E+00	0.0000	2.507E-09	0.0008	0.000E+00	0.0000	2.687E-10	0.0001
U-238	7.870E-09	0.0027	2.868E-10	0.0001	0.000E+00	0.0000	3.097E-09	0.0010	0.000E+00	0.0000	3.320E-10	0.0001
Total	1.850E-06	0.6234	6.540E-09	0.0022	0.000E+00	0.0000	1.074E-06	0.3619	0.000E+00	0.0000	3.695E-08	0.0125

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.102E-08	0.0172
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.105E-07	0.0373
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.754E-07	0.2613
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.968E-06	0.6632
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.161E-09	0.0017
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.071E-09	0.0010
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.256E-08	0.0143
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.159E-08	0.0039
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.967E-06	1.0000

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

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+01 years

Radionuclides

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

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

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground risk	Ground fract.	Inhalation risk	Inhalation fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	Soil risk	Soil fract.
Ac-227	6.170E-09	0.0021	1.527E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	5.842E-11	0.0000	0.000E+00	0.0000	1.062E-10	0.0000
Pa-231	5.178E-08	0.0175	1.959E-09	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	9.988E-08	0.0337	0.000E+00	0.0000	1.341E-09	0.0005
Pb-210	2.792E-10	0.0001	3.337E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	2.155E-07	0.0726	0.000E+00	0.0000	8.471E-09	0.0029
Ra-226	1.714E-06	0.5778	1.862E-09	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	7.382E-07	0.2488	0.000E+00	0.0000	2.486E-08	0.0084
Th-230	2.996E-08	0.0101	1.302E-09	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	1.197E-08	0.0040	0.000E+00	0.0000	1.305E-09	0.0004
U-234	2.266E-11	0.0000	3.377E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	2.454E-09	0.0008	0.000E+00	0.0000	2.631E-10	0.0001
U-235	3.951E-08	0.0133	3.048E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	2.590E-09	0.0009	0.000E+00	0.0000	2.697E-10	0.0001
U-238	7.870E-09	0.0027	2.869E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	3.097E-09	0.0010	0.000E+00	0.0000	3.320E-10	0.0001
Total	1.850E-06	0.6234	6.540E-09	0.0022	0.000E+00	0.0000	0.000E+00	0.0000	1.074E-06	0.3619	0.000E+00	0.0000	3.695E-08	0.0125

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

Water Dependent Pathways

Radio-Nuclide	Water risk	Water fract.	Fish risk	Fish fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	All pathways risk	All pathways fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.487E-09	0.0022
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.550E-07	0.0522
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.246E-07	0.0757
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.479E-06	0.8356
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.454E-08	0.0150
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.077E-09	0.0010
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.267E-08	0.0144
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.159E-08	0.0039
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.967E-06	1.0000

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

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

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways				
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	4.395E-05	0.000E+00	1.194E-02	0.000E+00	9.966E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.191E-02
Pa-231	1.031E-04	0.000E+00	3.723E+00	0.000E+00	2.338E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.746E+00
Pb-210	1.810E-03	0.000E+00	1.046E+01	0.000E+00	4.105E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.087E+01
Ra-226	1.846E-03	0.000E+00	2.069E+01	0.000E+00	4.186E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.111E+01
Th-230	1.794E-03	0.000E+00	1.079E+00	0.000E+00	4.069E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.486E+00
U-234	1.031E-04	0.000E+00	2.181E-01	0.000E+00	2.338E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.415E-01
U-235	1.031E-04	0.000E+00	2.181E-01	0.000E+00	2.338E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.415E-01
U-238	1.031E-04	0.000E+00	2.181E-01	0.000E+00	2.338E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.415E-01

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	5.867E-09	0.0022	1.415E-10	0.0001	0.000E+00	0.0000	1.180E-10	0.0000	0.000E+00	0.0000	9.844E-11	0.0000
Pa-231	1.308E-09	0.0005	1.189E-10	0.0000	0.000E+00	0.0000	1.273E-08	0.0047	0.000E+00	0.0000	7.994E-11	0.0000
Pb-210	9.536E-10	0.0004	1.108E-09	0.0004	0.000E+00	0.0000	7.169E-07	0.2635	0.000E+00	0.0000	2.813E-08	0.0103
Ra-226	1.724E-06	0.6335	1.039E-09	0.0004	0.000E+00	0.0000	2.120E-07	0.0779	0.000E+00	0.0000	4.290E-09	0.0016
Th-230	1.832E-10	0.0001	1.211E-09	0.0004	0.000E+00	0.0000	2.549E-09	0.0009	0.000E+00	0.0000	9.612E-10	0.0004
U-234	2.485E-12	0.0000	4.337E-11	0.0000	0.000E+00	0.0000	3.152E-10	0.0001	0.000E+00	0.0000	3.378E-11	0.0000
U-235	5.209E-09	0.0019	3.900E-11	0.0000	0.000E+00	0.0000	3.222E-10	0.0001	0.000E+00	0.0000	3.454E-11	0.0000
U-238	1.036E-09	0.0004	3.686E-11	0.0000	0.000E+00	0.0000	3.981E-10	0.0001	0.000E+00	0.0000	4.266E-11	0.0000
Total	1.738E-06	0.6388	3.738E-09	0.0014	0.000E+00	0.0000	9.453E-07	0.3474	0.000E+00	0.0000	3.367E-08	0.0124

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.225E-09	0.0023
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.424E-08	0.0052
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.471E-07	0.2746
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.941E-06	0.7133
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.904E-09	0.0018
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.948E-10	0.0001
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.604E-09	0.0021
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.513E-09	0.0006
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.721E-06	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground risk	Ground fract.	Inhalation risk	Inhalation fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	Soil risk	Soil fract.
Ac-227	4.348E-12	0.0000	1.050E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.016E-14	0.0000	0.000E+00	0.0000	7.301E-14	0.0000
Pa-231	7.156E-09	0.0026	2.597E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	1.282E-08	0.0047	0.000E+00	0.0000	1.779E-10	0.0001
Pb-210	3.017E-11	0.0000	3.507E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.265E-08	0.0083	0.000E+00	0.0000	8.902E-10	0.0003
Ra-226	1.645E-06	0.6048	2.027E-09	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	8.726E-07	0.3207	0.000E+00	0.0000	3.039E-08	0.0112
Th-230	7.918E-08	0.0291	1.295E-09	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	3.615E-08	0.0133	0.000E+00	0.0000	2.094E-09	0.0008
U-234	1.988E-11	0.0000	4.374E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.227E-10	0.0001	0.000E+00	0.0000	3.429E-11	0.0000
U-235	5.223E-09	0.0019	3.956E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.518E-10	0.0001	0.000E+00	0.0000	3.492E-11	0.0000
U-238	1.036E-09	0.0004	3.688E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.981E-10	0.0001	0.000E+00	0.0000	4.267E-11	0.0000
Total	1.738E-06	0.6388	3.738E-09	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	9.453E-07	0.3474	0.000E+00	0.0000	3.367E-08	0.0124

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

Water Dependent Pathways

Radio-Nuclide	Water risk	Water fract.	Fish risk	Fish fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	All pathways risk	All pathways fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.566E-12	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.041E-08	0.0075
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.360E-08	0.0087
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.551E-06	0.9374
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.187E-07	0.0436
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.206E-10	0.0002
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.650E-09	0.0021
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.513E-09	0.0006
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.721E-06	1.0000

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

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 3.000E+02 years

	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways				
Radio-Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.244E-07	0.000E+00	3.383E-05	0.000E+00	2.821E-05	0.000E+00	0.000E+00	0.000E+00	6.382E-05	0.000E+00	1.259E-04
Pa-231	2.920E-07	0.000E+00	1.055E-02	0.000E+00	6.622E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.061E-02
Pb-210	1.639E-03	0.000E+00	9.471E+00	0.000E+00	3.716E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.842E+00
Ra-226	1.672E-03	0.000E+00	1.874E+01	0.000E+00	3.790E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.911E+01
Th-230	1.539E-03	0.000E+00	9.256E-01	0.000E+00	3.491E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.275E+00
U-234	2.920E-07	0.000E+00	6.178E-04	0.000E+00	6.622E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.840E-04
U-235	2.920E-07	0.000E+00	6.178E-04	0.000E+00	6.622E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.840E-04
U-238	2.920E-07	0.000E+00	6.178E-04	0.000E+00	6.622E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.840E-04

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.787E-11	0.0000	4.006E-13	0.0000	0.000E+00	0.0000	3.341E-13	0.0000	0.000E+00	0.0000	2.787E-13	0.0000
Pa-231	3.984E-12	0.0000	3.366E-13	0.0000	0.000E+00	0.0000	3.606E-11	0.0000	0.000E+00	0.0000	2.264E-13	0.0000
Pb-210	9.384E-10	0.0004	1.003E-09	0.0004	0.000E+00	0.0000	6.487E-07	0.2559	0.000E+00	0.0000	2.545E-08	0.0100
Ra-226	1.658E-06	0.6540	9.401E-10	0.0004	0.000E+00	0.0000	1.919E-07	0.0757	0.000E+00	0.0000	3.882E-09	0.0015
Th-230	1.710E-10	0.0001	1.039E-09	0.0004	0.000E+00	0.0000	2.186E-09	0.0009	0.000E+00	0.0000	8.243E-10	0.0003
U-234	7.668E-15	0.0000	1.228E-13	0.0000	0.000E+00	0.0000	8.926E-13	0.0000	0.000E+00	0.0000	9.567E-14	0.0000
U-235	1.595E-11	0.0000	1.104E-13	0.0000	0.000E+00	0.0000	9.126E-13	0.0000	0.000E+00	0.0000	9.781E-14	0.0000
U-238	3.145E-12	0.0000	1.044E-13	0.0000	0.000E+00	0.0000	1.127E-12	0.0000	0.000E+00	0.0000	1.208E-13	0.0000
Total	1.659E-06	0.6544	2.983E-09	0.0012	0.000E+00	0.0000	8.428E-07	0.3325	0.000E+00	0.0000	3.016E-08	0.0119

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.017E-12	0.0000	0.000E+00	0.0000	1.990E-11	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.061E-11	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.761E-07	0.2667
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.854E-06	0.7316
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.220E-09	0.0017
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.119E-12	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.707E-11	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.498E-12	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.017E-12	0.0000	0.000E+00	0.0000	2.535E-06	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	4.280E-21	0.0000	9.603E-23	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.675E-23	0.0000	0.000E+00	0.0000	6.680E-23	0.0000
Pa-231	2.172E-11	0.0000	7.325E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.616E-11	0.0000	0.000E+00	0.0000	5.018E-13	0.0000
Pb-210	5.225E-14	0.0000	5.586E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.608E-11	0.0000	0.000E+00	0.0000	1.418E-12	0.0000
Ra-226	1.458E-06	0.5754	1.720E-09	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	7.464E-07	0.2945	0.000E+00	0.0000	2.608E-08	0.0103
Th-230	2.003E-07	0.0790	1.261E-09	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	9.632E-08	0.0380	0.000E+00	0.0000	4.077E-09	0.0016
U-234	5.612E-11	0.0000	5.119E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.766E-11	0.0000	0.000E+00	0.0000	1.255E-12	0.0000
U-235	1.608E-11	0.0000	1.151E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.150E-12	0.0000	0.000E+00	0.0000	1.010E-13	0.0000
U-238	3.150E-12	0.0000	1.045E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.130E-12	0.0000	0.000E+00	0.0000	1.210E-13	0.0000
Total	1.659E-06	0.6544	2.983E-09	0.0012	0.000E+00	0.0000	0.000E+00	0.0000	8.428E-07	0.3325	0.000E+00	0.0000	3.016E-08	0.0119

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.462E-15	0.0000	0.000E+00	0.0000	1.462E-15	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.012E-12	0.0000	0.000E+00	0.0000	6.012E-11	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.761E-11	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.233E-06	0.8808
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.020E-07	0.1191
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.555E-11	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.862E-15	0.0000	0.000E+00	0.0000	1.745E-11	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.506E-12	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.017E-12	0.0000	0.000E+00	0.0000	2.535E-06	1.0000

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

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

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways				
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.392E-16	0.000E+00	3.784E-14	0.000E+00	3.156E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.490E-03	0.000E+00	2.490E-03
Pa-231	3.267E-16	0.000E+00	1.180E-11	0.000E+00	7.408E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.128E-01	0.000E+00	2.128E-01
Pb-210	1.041E-03	0.000E+00	6.016E+00	0.000E+00	2.360E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.764E-07	0.000E+00	6.252E+00
Ra-226	1.060E-03	0.000E+00	1.188E+01	0.000E+00	2.403E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.185E-08	0.000E+00	1.212E+01
Th-230	8.323E-04	0.000E+00	5.004E-01	0.000E+00	1.887E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.045E-07	0.000E+00	6.892E-01
U-234	3.267E-16	0.000E+00	6.912E-13	0.000E+00	7.408E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.447E-02	0.000E+00	1.447E-02
U-235	3.267E-16	0.000E+00	6.912E-13	0.000E+00	7.408E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.447E-02	0.000E+00	1.447E-02
U-238	3.267E-16	0.000E+00	6.912E-13	0.000E+00	7.408E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.447E-02	0.000E+00	1.447E-02

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.668E-20	0.0000	4.473E-22	0.0000	0.000E+00	0.0000	3.731E-22	0.0000	0.000E+00	0.0000	3.112E-22	0.0000
Pa-231	5.938E-21	0.0000	3.759E-22	0.0000	0.000E+00	0.0000	4.026E-20	0.0000	0.000E+00	0.0000	2.528E-22	0.0000
Pb-210	8.504E-10	0.0005	6.352E-10	0.0003	0.000E+00	0.0000	4.110E-07	0.2180	0.000E+00	0.0000	1.612E-08	0.0086
Ra-226	1.329E-06	0.7048	5.944E-10	0.0003	0.000E+00	0.0000	1.213E-07	0.0644	0.000E+00	0.0000	2.454E-09	0.0013
Th-230	1.313E-10	0.0001	5.603E-10	0.0003	0.000E+00	0.0000	1.179E-09	0.0006	0.000E+00	0.0000	4.447E-10	0.0002
U-234	1.228E-23	0.0000	1.371E-22	0.0000	0.000E+00	0.0000	9.967E-22	0.0000	0.000E+00	0.0000	1.068E-22	0.0000
U-235	2.436E-20	0.0000	1.233E-22	0.0000	0.000E+00	0.0000	1.019E-21	0.0000	0.000E+00	0.0000	1.092E-22	0.0000
U-238	4.660E-21	0.0000	1.166E-22	0.0000	0.000E+00	0.0000	1.259E-21	0.0000	0.000E+00	0.0000	1.349E-22	0.0000
Total	1.330E-06	0.7054	1.790E-09	0.0009	0.000E+00	0.0000	5.335E-07	0.2830	0.000E+00	0.0000	1.902E-08	0.0101

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

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.252E-11	0.0000	0.000E+00	0.0000	3.252E-11	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.618E-10	0.0005	0.000E+00	0.0000	9.618E-10	0.0005
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.981E-14	0.0000	0.000E+00	0.0000	4.286E-07	0.2274
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.336E-16	0.0000	0.000E+00	0.0000	1.453E-06	0.7708
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.959E-16	0.0000	0.000E+00	0.0000	2.316E-09	0.0012
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.763E-11	0.0000	0.000E+00	0.0000	2.763E-11	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.825E-11	0.0000	0.000E+00	0.0000	2.825E-11	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.490E-11	0.0000	0.000E+00	0.0000	3.490E-11	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.085E-09	0.0006	0.000E+00	0.0000	1.885E-06	1.0000

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

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

Radionuclides

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

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

Intrisk : NFSS VP H Prime Surface Soil (0-0.15m) Adult Trespasser
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pa-231	3.193E-20	0.0000	8.059E-22	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.978E-20	0.0000	0.000E+00	0.0000	5.521E-22	0.0000
Pb-210	1.114E-23	0.0000	8.328E-24	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.379E-21	0.0000	0.000E+00	0.0000	2.114E-22	0.0000
Ra-226	9.043E-07	0.4798	8.412E-10	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	3.651E-07	0.1937	0.000E+00	0.0000	1.276E-08	0.0068
Th-230	4.251E-07	0.2255	9.485E-10	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	1.683E-07	0.0893	0.000E+00	0.0000	6.264E-09	0.0033
U-234	1.296E-10	0.0001	2.948E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.128E-11	0.0000	0.000E+00	0.0000	1.913E-12	0.0000
U-235	2.504E-20	0.0000	1.406E-22	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.877E-21	0.0000	0.000E+00	0.0000	1.210E-22	0.0000
U-238	1.243E-14	0.0000	2.886E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.914E-15	0.0000	0.000E+00	0.0000	1.837E-16	0.0000
Total	1.330E-06	0.7054	1.790E-09	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	5.335E-07	0.2830	0.000E+00	0.0000	1.902E-08	0.0101

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.733E-10	0.0005	0.000E+00	0.0000	9.733E-10	0.0005
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.610E-21	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.283E-06	0.6807
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.006E-07	0.3187
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.757E-11	0.0000	0.000E+00	0.0000	2.107E-10	0.0001
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.926E-11	0.0000	0.000E+00	0.0000	4.926E-11	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.498E-11	0.0000	0.000E+00	0.0000	3.499E-11	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.085E-09	0.0006	0.000E+00	0.0000	1.885E-06	1.0000

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

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adult Trespasser
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Part I: Mixture Sums and Single Radionuclide Guidelines

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adult Trespasser
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Dose Conversion Factor (and Related) Parameter Summary
Dose Library: ICRP 72 (Adult)

Menu	Parameter	Current Value#	Base Case*	Parameter Name
A-1	DCF's for external ground radiation, (mrem/yr)/(pCi/g)			
A-1	Ac-227 (Source: ICRP 60)	4.485E-04	4.485E-04	DCF1(1)
A-1	At-218 (Source: ICRP 60)	4.878E-03	4.878E-03	DCF1(2)
A-1	Bi-210 (Source: ICRP 60)	5.476E-03	5.476E-03	DCF1(3)
A-1	Bi-211 (Source: ICRP 60)	2.373E-01	2.373E-01	DCF1(4)
A-1	Bi-214 (Source: ICRP 60)	9.325E+00	9.325E+00	DCF1(5)
A-1	Fr-223 (Source: ICRP 60)	1.813E-01	1.813E-01	DCF1(6)
A-1	Pa-231 (Source: ICRP 60)	1.762E-01	1.762E-01	DCF1(7)
A-1	Pa-234 (Source: ICRP 60)	1.088E+01	1.088E+01	DCF1(8)
A-1	Pa-234m (Source: ICRP 60)	9.867E-02	9.867E-02	DCF1(9)
A-1	Pb-210 (Source: ICRP 60)	1.981E-03	1.981E-03	DCF1(10)
A-1	Pb-211 (Source: ICRP 60)	2.915E-01	2.915E-01	DCF1(11)
A-1	Pb-214 (Source: ICRP 60)	1.243E+00	1.243E+00	DCF1(12)
A-1	Po-210 (Source: ICRP 60)	4.934E-05	4.934E-05	DCF1(13)
A-1	Po-211 (Source: ICRP 60)	4.485E-02	4.485E-02	DCF1(14)
A-1	Po-214 (Source: ICRP 60)	4.840E-04	4.840E-04	DCF1(15)
A-1	Po-215 (Source: ICRP 60)	9.456E-04	9.456E-04	DCF1(16)
A-1	Po-218 (Source: ICRP 60)	5.326E-05	5.326E-05	DCF1(17)
A-1	Ra-223 (Source: ICRP 60)	5.532E-01	5.532E-01	DCF1(18)
A-1	Ra-226 (Source: ICRP 60)	2.915E-02	2.915E-02	DCF1(19)
A-1	Rn-219 (Source: ICRP 60)	2.859E-01	2.859E-01	DCF1(20)
A-1	Rn-222 (Source: ICRP 60)	2.186E-03	2.186E-03	DCF1(21)
A-1	Th-227 (Source: ICRP 60)	4.803E-01	4.803E-01	DCF1(22)
A-1	Th-230 (Source: ICRP 60)	1.071E-03	1.071E-03	DCF1(23)
A-1	Th-231 (Source: ICRP 60)	3.214E-02	3.214E-02	DCF1(24)
A-1	Th-234 (Source: ICRP 60)	2.130E-02	2.130E-02	DCF1(25)
A-1	Tl-207 (Source: ICRP 60)	2.299E-02	2.299E-02	DCF1(26)
A-1	Tl-210 (Source: ICRP 60)	1.661E+01	1.661E+01	DCF1(27)
A-1	U-234 (Source: ICRP 60)	3.439E-04	3.439E-04	DCF1(28)
A-1	U-235 (Source: ICRP 60)	6.597E-01	6.597E-01	DCF1(29)
A-1	U-238 (Source: ICRP 60)	7.961E-05	7.961E-05	DCF1(30)
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	2.104E+00	2.035E+00	DCF2(1)
B-1	Pa-231	5.180E-01	5.180E-01	DCF2(2)
B-1	Pb-210+D	3.697E-02	2.072E-02	DCF2(3)
B-1	Ra-226+D	3.526E-02	3.515E-02	DCF2(4)
B-1	Th-230	3.700E-01	3.700E-01	DCF2(5)
B-1	U-234	3.478E-02	3.478E-02	DCF2(6)
B-1	U-235+D	3.145E-02	3.145E-02	DCF2(7)
B-1	U-238	2.960E-02	2.960E-02	DCF2(8)
B-1	U-238+D	2.963E-02	2.960E-02	DCF2(9)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	4.473E-03	4.070E-03	DCF3(1)
D-1	Pa-231	2.627E-03	2.627E-03	DCF3(2)
D-1	Pb-210+D	6.998E-03	2.553E-03	DCF3(3)
D-1	Ra-226+D	1.037E-03	1.036E-03	DCF3(4)
D-1	Th-230	7.770E-04	7.770E-04	DCF3(5)
D-1	U-234	1.813E-04	1.813E-04	DCF3(6)

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adult Trespasser
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Dose Conversion Factor (and Related) Parameter Summary (continued)
Dose Library: ICRP 72 (Adult)

Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-1	U-235+D	1.752E-04	1.739E-04	DCF3(7)
D-1	U-238	1.665E-04	1.665E-04	DCF3(8)
D-1	U-238+D	1.791E-04	1.665E-04	DCF3(9)
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	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(2,1)
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(2,2)
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(2,3)
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(3,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(3,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(3,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(4,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(4,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(4,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(5,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(5,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(5,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(6,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(6,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(6,3)
D-34				
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(7,1)
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(7,2)
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(7,3)
D-34				
D-34	U-238 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(8,1)
D-34	U-238 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(8,2)
D-34	U-238 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(8,3)
D-34				
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(9,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(9,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(9,3)
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	Pa-231 , fish	1.000E+01	1.000E+01	BIOFAC(2,1)
D-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(2,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(3,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(3,2)

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adult Trespasser

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Dose Conversion Factor (and Related) Parameter Summary (continued)

Dose Library: ICRP 72 (Adult)

Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(4,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(4,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(5,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(5,2)
D-5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(6,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(6,2)
D-5				
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIOFAC(7,1)
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(7,2)
D-5				
D-5	U-238 , fish	1.000E+01	1.000E+01	BIOFAC(8,1)
D-5	U-238 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(8,2)
D-5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(9,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(9,2)

#For DCF1(xxx) only, factors are for infinite depth & area. See ETFG table in Ground Pathway of Detailed Report.

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

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adult Trespasser

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Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.620E+04	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	1.370E+00	2.000E+00	---	THICK0
R011	Fraction of contamination that is submerged	0.000E+00	0.000E+00	---	SUBMFRACT
R011	Length parallel to aquifer flow (m)	1.000E+02	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Ac-227	1.000E+00	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g): Pa-231	1.000E+00	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Pb-210	1.000E+00	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): Ra-226	1.000E+00	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Th-230	1.000E+00	0.000E+00	---	S1(5)
R012	Initial principal radionuclide (pCi/g): U-234	1.000E+00	0.000E+00	---	S1(6)
R012	Initial principal radionuclide (pCi/g): U-235	1.000E+00	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): U-238	1.000E+00	0.000E+00	---	S1(8)
R012	Concentration in groundwater (pCi/L): Ac-227	not used	0.000E+00	---	W1(1)
R012	Concentration in groundwater (pCi/L): Pa-231	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Pb-210	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	W1(4)
R012	Concentration in groundwater (pCi/L): Th-230	not used	0.000E+00	---	W1(5)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(6)
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	---	W1(7)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(8)
R013	Cover depth (m)	1.500E-01	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	1.700E+00	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	6.000E-05	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.700E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	6.000E-05	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.200E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	3.600E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	6.840E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	1.040E+01	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	4.400E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	9.000E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	4.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.000E+06	1.000E+06	---	WAREA

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adult Trespasser
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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	4.000E-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)	1.000E+02	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	---	HGWT
R014	Saturated zone b parameter	5.300E+00	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	1.000E-03	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	---	UW
R015	Number of unsaturated zone strata	1	1	---	NS
R015	Unsat. zone 1, thickness (m)	4.000E+00	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.500E+00	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	4.000E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	2.000E-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	5.300E+00	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for 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	7.860E-03	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for Pa-231				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.164E-03	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Pb-210				
R016	Contaminated zone (cm**3/g)	2.100E+03	1.000E+02	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	2.100E+03	1.000E+02	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	2.100E+03	1.000E+02	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.564E-05	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	3.800E+04	7.000E+01	---	DCNUCC(4)
R016	Unsaturated zone 1 (cm**3/g)	3.800E+04	7.000E+01	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	3.800E+04	7.000E+01	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.181E-06	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Th-230				
R016	Contaminated zone (cm**3/g)	4.500E+03	6.000E+04	---	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	4.500E+03	6.000E+04	---	DCNUCU(5,1)
R016	Saturated zone (cm**3/g)	4.500E+03	6.000E+04	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.530E-05	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(6)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.164E-03	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R016	Distribution coefficients for U-235				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(7)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(7,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.164E-03	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(8)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(8,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.164E-03	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R017	Inhalation rate (m**3/yr)	2.000E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	2.000E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	1.000E+00	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	1.200E-02	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)

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adult Trespasser
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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	1.042E+02	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	not used	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	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	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	not used	-1	---	FPLANT
R018	Contamination fraction of meat	1.620E-01	-1	---	FMEAT
R018	Contamination fraction of milk	not used	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	6.800E+01	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	5.000E+01	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	not used	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	not used	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	0.000E+00	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	0.000E+00	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	1.100E+00	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	not used	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	8.000E-02	8.000E-02	---	TE(3)

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adult Trespasser
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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	not used	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	1.000E+00	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	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)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
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	0.000E+00	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

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adult Trespasser
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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	257	---	---	KYMAX

Summary of Pathway Selections

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

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adult Trespasser

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Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	16200.00 square meters	Ac-227	1.000E+00
Thickness:	1.37 meters	Pa-231	1.000E+00
Cover Depth:	0.15 meters	Pb-210	1.000E+00
		Ra-226	1.000E+00
		Th-230	1.000E+00
		U-234	1.000E+00
		U-235	1.000E+00
		U-238	1.000E+00

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):	2.369E-01	2.366E-01	2.360E-01	2.338E-01	2.281E-01	2.108E-01	1.788E-01	1.691E-01
M(t):	9.475E-03	9.463E-03	9.438E-03	9.354E-03	9.123E-03	8.430E-03	7.152E-03	6.764E-03

Maximum TDOSE(t): 2.369E-01 mrem/yr at t = 0.000E+00 years

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adult Trespasser
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Ac-227	1.047E-03	0.0044	7.915E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.099E-04	0.0009	0.000E+00	0.0000	3.816E-07	0.0000
Pa-231	1.134E-04	0.0005	2.167E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.258E-01	0.5311	0.000E+00	0.0000	2.378E-07	0.0000
Pb-210	1.138E-06	0.0000	1.399E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.271E-02	0.2226	0.000E+00	0.0000	6.004E-07	0.0000
Ra-226	1.525E-02	0.0644	1.391E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.083E-02	0.1724	0.000E+00	0.0000	1.034E-07	0.0000
Th-230	3.399E-06	0.0000	1.429E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.227E-05	0.0003	0.000E+00	0.0000	6.809E-08	0.0000
U-234	2.042E-08	0.0000	1.341E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.472E-04	0.0006	0.000E+00	0.0000	1.585E-08	0.0000
U-235	2.226E-04	0.0009	1.213E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.434E-04	0.0006	0.000E+00	0.0000	1.532E-08	0.0000
U-238	1.369E-04	0.0006	1.142E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.454E-04	0.0006	0.000E+00	0.0000	1.566E-08	0.0000
Total	1.678E-02	0.0708	1.216E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.201E-01	0.9292	0.000E+00	0.0000	1.438E-06	0.0000

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

Water Dependent Pathways

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.258E-03	0.0053
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.259E-01	0.5316
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.272E-02	0.2226
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.609E-02	0.2368
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.588E-05	0.0004
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.473E-04	0.0006
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.660E-04	0.0015
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.823E-04	0.0012
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.369E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adult Trespasser
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	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.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Ac-227	1.007E-03	0.0043	2.292E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.020E-04	0.0009	0.000E+00	0.0000	1.105E-06	0.0000
Pa-231	1.459E-04	0.0006	7.140E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.255E-01	0.5304	0.000E+00	0.0000	7.432E-07	0.0000
Pb-210	1.105E-06	0.0000	4.082E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.112E-02	0.2161	0.000E+00	0.0000	1.752E-06	0.0000
Ra-226	1.526E-02	0.0645	4.285E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.244E-02	0.1794	0.000E+00	0.0000	3.590E-07	0.0000
Th-230	1.001E-05	0.0000	4.288E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.006E-04	0.0004	0.000E+00	0.0000	2.044E-07	0.0000
U-234	2.046E-08	0.0000	4.012E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.470E-04	0.0006	0.000E+00	0.0000	4.741E-08	0.0000
U-235	2.222E-04	0.0009	3.629E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.459E-04	0.0006	0.000E+00	0.0000	4.583E-08	0.0000
U-238	1.366E-04	0.0006	3.417E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.452E-04	0.0006	0.000E+00	0.0000	4.683E-08	0.0000
Total	1.678E-02	0.0709	3.629E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.198E-01	0.9290	0.000E+00	0.0000	4.304E-06	0.0000

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

Water Dependent Pathways

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.213E-03	0.0051
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.256E-01	0.5310
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.112E-02	0.2161
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.770E-02	0.2439
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.112E-04	0.0005
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.471E-04	0.0006
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.681E-04	0.0016
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.818E-04	0.0012
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.366E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adult Trespasser
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	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.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Ac-227	9.326E-04	0.0040	4.947E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.872E-04	0.0008	0.000E+00	0.0000	2.385E-06	0.0000
Pa-231	2.069E-04	0.0009	1.977E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.248E-01	0.5289	0.000E+00	0.0000	1.878E-06	0.0000
Pb-210	1.041E-06	0.0000	8.959E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.807E-02	0.2037	0.000E+00	0.0000	3.845E-06	0.0000
Ra-226	1.527E-02	0.0647	1.056E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.551E-02	0.1929	0.000E+00	0.0000	1.079E-06	0.0000
Th-230	2.326E-05	0.0001	1.001E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.392E-04	0.0006	0.000E+00	0.0000	4.777E-07	0.0000
U-234	2.071E-08	0.0000	9.304E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.465E-04	0.0006	0.000E+00	0.0000	1.100E-07	0.0000
U-235	2.214E-04	0.0009	8.423E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.506E-04	0.0006	0.000E+00	0.0000	1.063E-07	0.0000
U-238	1.359E-04	0.0006	7.923E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.447E-04	0.0006	0.000E+00	0.0000	1.086E-07	0.0000
Total	1.679E-02	0.0712	8.376E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.191E-01	0.9288	0.000E+00	0.0000	9.990E-06	0.0000

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

Water Dependent Pathways

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.127E-03	0.0048
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.250E-01	0.5298
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.808E-02	0.2038
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.078E-02	0.2576
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.640E-04	0.0007
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.467E-04	0.0006
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.722E-04	0.0016
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.809E-04	0.0012
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.360E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adult Trespasser
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 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.
Ac-227	7.121E-04	0.0030	1.125E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.432E-04	0.0006	0.000E+00	0.0000	5.422E-06	0.0000
Pa-231	3.848E-04	0.0016	8.649E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.225E-01	0.5237	0.000E+00	0.0000	6.884E-06	0.0000
Pb-210	8.447E-07	0.0000	2.162E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.877E-02	0.1658	0.000E+00	0.0000	9.279E-06	0.0000
Ra-226	1.531E-02	0.0655	3.681E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.484E-02	0.2345	0.000E+00	0.0000	5.475E-06	0.0000
Th-230	6.988E-05	0.0003	3.002E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.939E-04	0.0013	0.000E+00	0.0000	1.446E-06	0.0000
U-234	2.345E-08	0.0000	2.732E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.448E-04	0.0006	0.000E+00	0.0000	3.227E-07	0.0000
U-235	2.187E-04	0.0009	2.483E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.669E-04	0.0007	0.000E+00	0.0000	3.130E-07	0.0000
U-238	1.338E-04	0.0006	2.325E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.430E-04	0.0006	0.000E+00	0.0000	3.187E-07	0.0000
Total	1.683E-02	0.0720	2.424E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	2.170E-01	0.9278	0.000E+00	0.0000	2.946E-05	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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.720E-04	0.0037
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.229E-01	0.5254
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.878E-02	0.1658
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.016E-02	0.3000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.682E-04	0.0016
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.454E-04	0.0006
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.862E-04	0.0017
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.774E-04	0.0012
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.338E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adult Trespasser
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 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.
Ac-227	3.295E-04	0.0014	1.477E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	6.665E-05	0.0003	0.000E+00	0.0000	7.122E-06	0.0000
Pa-231	6.787E-04	0.0030	3.742E-05	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	1.160E-01	0.5084	0.000E+00	0.0000	2.544E-05	0.0001
Pb-210	4.655E-07	0.0000	3.368E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.097E-02	0.0919	0.000E+00	0.0000	1.446E-05	0.0001
Ra-226	1.542E-02	0.0676	1.349E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.263E-02	0.3184	0.000E+00	0.0000	2.817E-05	0.0001
Th-230	2.051E-04	0.0009	8.722E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.612E-04	0.0038	0.000E+00	0.0000	4.393E-06	0.0000
U-234	4.706E-08	0.0000	7.464E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.400E-04	0.0006	0.000E+00	0.0000	8.807E-07	0.0000
U-235	2.114E-04	0.0009	6.902E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.098E-04	0.0009	0.000E+00	0.0000	8.629E-07	0.0000
U-238	1.279E-04	0.0006	6.340E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.382E-04	0.0006	0.000E+00	0.0000	8.690E-07	0.0000
Total	1.697E-02	0.0744	6.467E-05	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	2.110E-01	0.9249	0.000E+00	0.0000	8.220E-05	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 = 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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.180E-04	0.0018
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.167E-01	0.5116
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.098E-02	0.0920
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.808E-02	0.3862
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.079E-03	0.0047
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.417E-04	0.0006
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.228E-04	0.0019
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.677E-04	0.0012
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.281E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adult Trespasser
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 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.
Ac-227	2.220E-05	0.0001	3.024E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.554E-06	0.0000	0.000E+00	0.0000	1.458E-06	0.0000
Pa-231	8.193E-04	0.0039	1.300E-04	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	9.561E-02	0.4537	0.000E+00	0.0000	8.217E-05	0.0004
Pb-210	5.781E-08	0.0000	1.253E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.439E-03	0.0116	0.000E+00	0.0000	5.379E-06	0.0000
Ra-226	1.582E-02	0.0751	5.273E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.057E-02	0.4297	0.000E+00	0.0000	1.313E-04	0.0006
Th-230	7.028E-04	0.0033	2.880E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	3.482E-03	0.0165	0.000E+00	0.0000	1.804E-05	0.0001
U-234	3.071E-07	0.0000	1.987E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.246E-04	0.0006	0.000E+00	0.0000	2.334E-06	0.0000
U-235	1.881E-04	0.0009	2.001E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.225E-04	0.0015	0.000E+00	0.0000	2.393E-06	0.0000
U-238	1.093E-04	0.0005	1.675E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.218E-04	0.0006	0.000E+00	0.0000	2.295E-06	0.0000
Total	1.766E-02	0.0838	1.729E-04	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	1.927E-01	0.9142	0.000E+00	0.0000	2.454E-04	0.0012

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.124E-05	0.0001
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.664E-02	0.4585
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.444E-03	0.0116
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.065E-01	0.5055
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.232E-03	0.0201
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.292E-04	0.0006
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.149E-04	0.0024
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.351E-04	0.0011
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.108E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adult Trespasser
File : C:\USERS\H5TDERJC\DESKTOP\NFSS\02 - VPH\13 - RISK ASSESSMENT\04 - RESRAD\FINAL\TR SUBSURFACE SOIL.RAD

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	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.
Ac-227	9.992E-09	0.0000	3.224E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.045E-09	0.0000	0.000E+00	0.0000	1.554E-09	0.0000
Pa-231	5.602E-04	0.0031	2.097E-04	0.0012	0.000E+00	0.0000	0.000E+00	0.0000	5.478E-02	0.3063	0.000E+00	0.0000	1.320E-04	0.0007
Pb-210	1.492E-10	0.0000	7.368E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.193E-06	0.0000	0.000E+00	0.0000	3.162E-08	0.0000
Ra-226	1.703E-02	0.0952	1.479E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	9.053E-02	0.5063	0.000E+00	0.0000	3.747E-04	0.0021
Th-230	2.353E-03	0.0132	8.669E-05	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	1.182E-02	0.0661	0.000E+00	0.0000	8.702E-05	0.0005
U-234	2.437E-06	0.0000	3.269E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.420E-05	0.0005	0.000E+00	0.0000	3.801E-06	0.0000
U-235	1.347E-04	0.0008	4.064E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.290E-04	0.0024	0.000E+00	0.0000	4.359E-06	0.0000
U-238	6.981E-05	0.0004	2.661E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.155E-05	0.0005	0.000E+00	0.0000	3.647E-06	0.0000
Total	2.015E-02	0.1127	3.212E-04	0.0018	0.000E+00	0.0000	0.000E+00	0.0000	1.577E-01	0.8821	0.000E+00	0.0000	6.055E-04	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 = 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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.837E-09	0.0000	0.000E+00	0.0000	1.965E-08	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.368E-07	0.0000	0.000E+00	0.0000	5.568E-02	0.3114
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.225E-06	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.079E-01	0.6037
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.435E-02	0.0802
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.037E-04	0.0006
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.395E-09	0.0000	0.000E+00	0.0000	5.721E-04	0.0032
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.577E-04	0.0009
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.411E-07	0.0000	0.000E+00	0.0000	1.788E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adult Trespasser
File : C:\USERS\H5TDERJC\DESKTOP\NFSS\02 - VPH\13 - RISK ASSESSMENT\04 - RESRAD\FINAL\TR SUBSURFACE SOIL.RAD

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	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.
Ac-227	1.944E-20	0.0000	9.186E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.013E-21	0.0000	0.000E+00	0.0000	4.429E-21	0.0000
Pa-231	1.373E-04	0.0008	7.512E-05	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	7.478E-03	0.0442	0.000E+00	0.0000	4.726E-05	0.0003
Pb-210	1.308E-19	0.0000	8.268E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.219E-15	0.0000	0.000E+00	0.0000	3.548E-17	0.0000
Ra-226	2.207E-02	0.1305	3.626E-05	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	8.029E-02	0.4748	0.000E+00	0.0000	9.185E-04	0.0054
Th-230	1.172E-02	0.0693	2.925E-04	0.0017	0.000E+00	0.0000	0.000E+00	0.0000	4.193E-02	0.2479	0.000E+00	0.0000	6.015E-04	0.0036
U-234	2.435E-05	0.0001	1.924E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.021E-04	0.0006	0.000E+00	0.0000	2.664E-06	0.0000
U-235	4.142E-05	0.0002	2.598E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.750E-04	0.0010	0.000E+00	0.0000	2.290E-06	0.0000
U-238	1.463E-05	0.0001	9.702E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.541E-05	0.0001	0.000E+00	0.0000	1.329E-06	0.0000
Total	3.400E-02	0.2011	4.094E-04	0.0024	0.000E+00	0.0000	0.000E+00	0.0000	1.300E-01	0.7686	0.000E+00	0.0000	1.574E-03	0.0093

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.452E-20	0.0000	0.000E+00	0.0000	8.059E-20	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.031E-03	0.0179	0.000E+00	0.0000	1.077E-02	0.0637
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.256E-15	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.033E-01	0.6109
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.454E-02	0.3225
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.420E-05	0.0001	0.000E+00	0.0000	1.452E-04	0.0009
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.856E-05	0.0005	0.000E+00	0.0000	2.998E-04	0.0018
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.410E-05	0.0001	0.000E+00	0.0000	4.644E-05	0.0003
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.138E-03	0.0186	0.000E+00	0.0000	1.691E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adult Trespasser
File : C:\USERS\H5TDERJC\DESKTOP\NFSS\02 - VPH\13 - RISK ASSESSMENT\04 - RESRAD\FINAL\TR SUBSURFACE SOIL.RAD

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

Parent (i)	Product (j)	Thread Fraction	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g) 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-227+D	Ac-227+D	1.000E+00	1.258E-03	1.213E-03	1.127E-03	8.720E-04	4.180E-04	3.124E-05	1.965E-08	8.059E-20
Pa-231	Pa-231	1.000E+00	1.255E-01	1.252E-01	1.245E-01	1.221E-01	1.156E-01	9.532E-02	5.467E-02	1.046E-02
Pa-231	Ac-227+D	1.000E+00	3.840E-04	4.301E-04	5.025E-04	7.167E-04	1.088E-03	1.323E-03	1.015E-03	3.125E-04
Pa-231	äDSR(j)		1.259E-01	1.256E-01	1.250E-01	1.229E-01	1.167E-01	9.664E-02	5.568E-02	1.077E-02
Pb-210+D	Pb-210+D	1.000E+00	5.272E-02	5.112E-02	4.808E-02	3.878E-02	2.098E-02	2.444E-03	5.225E-06	2.256E-15
Ra-226+D	Ra-226+D	1.000E+00	5.491E-02	5.490E-02	5.489E-02	5.486E-02	5.476E-02	5.444E-02	5.361E-02	5.211E-02
Ra-226+D	Pb-210+D	1.000E+00	1.180E-03	2.801E-03	5.884E-03	1.530E-02	3.332E-02	5.209E-02	5.433E-02	5.119E-02
Ra-226+D	äDSR(j)		5.609E-02	5.770E-02	6.078E-02	7.016E-02	8.808E-02	1.065E-01	1.079E-01	1.033E-01
Th-230	Th-230	1.000E+00	7.472E-05	7.541E-05	7.678E-05	8.159E-05	9.531E-05	1.431E-04	2.781E-04	7.323E-04
Th-230	Ra-226+D	1.000E+00	1.098E-05	3.475E-05	8.235E-05	2.491E-04	7.270E-04	2.417E-03	7.408E-03	2.767E-02
Th-230	Pb-210+D	1.000E+00	1.886E-07	1.054E-06	4.832E-06	3.751E-05	2.571E-04	1.672E-03	6.662E-03	2.613E-02
Th-230	äDSR(j)		8.588E-05	1.112E-04	1.640E-04	3.682E-04	1.079E-03	4.232E-03	1.435E-02	5.454E-02
U-234	U-234	1.000E+00	1.473E-04	1.471E-04	1.467E-04	1.454E-04	1.415E-04	1.276E-04	8.924E-05	3.213E-05
U-234	Th-230	1.000E+00	6.052E-10	1.290E-09	2.679E-09	7.856E-09	2.522E-08	1.114E-07	4.882E-07	2.019E-06
U-234	Ra-226+D	1.000E+00	3.168E-11	2.371E-10	1.287E-09	1.162E-08	9.678E-08	9.930E-07	7.627E-06	5.749E-05
U-234	Pb-210+D	1.000E+00	4.639E-13	5.526E-12	5.437E-11	1.229E-09	2.486E-08	5.598E-07	6.352E-06	5.360E-05
U-234	äDSR(j)		1.473E-04	1.471E-04	1.467E-04	1.454E-04	1.417E-04	1.292E-04	1.037E-04	1.452E-04
U-235+D	U-235+D	1.000E+00	3.648E-04	3.643E-04	3.631E-04	3.591E-04	3.478E-04	3.099E-04	2.175E-04	6.960E-05
U-235+D	Pa-231	1.000E+00	1.188E-06	3.830E-06	9.078E-06	2.700E-05	7.450E-05	2.028E-04	3.486E-04	2.237E-04
U-235+D	Ac-227+D	1.000E+00	3.654E-09	1.232E-08	3.197E-08	1.219E-07	5.048E-07	2.270E-06	5.974E-06	6.514E-06
U-235+D	äDSR(j)		3.660E-04	3.681E-04	3.722E-04	3.862E-04	4.228E-04	5.149E-04	5.721E-04	2.998E-04
U-238	U-238		5.400E-05	7.303E-09	7.294E-09	7.275E-09	7.209E-09	7.016E-09	6.321E-09	4.417E-09	1.593E-09
U-238+D	U-238+D	9.999E-01	2.823E-04	2.818E-04	2.808E-04	2.774E-04	2.676E-04	2.351E-04	1.576E-04	4.628E-05
U-238+D	U-234	9.999E-01	2.087E-10	6.255E-10	1.456E-09	4.328E-09	1.224E-08	3.635E-08	7.605E-08	9.125E-08
U-238+D	Th-230	9.999E-01	6.860E-16	3.383E-15	1.468E-14	1.204E-13	1.084E-12	1.507E-11	1.760E-10	1.572E-09
U-238+D	Ra-226+D	9.999E-01	2.160E-17	3.517E-16	4.261E-15	1.144E-13	2.745E-12	8.975E-11	1.868E-09	3.346E-08
U-238+D	Pb-210+D	9.999E-01	2.821E-19	6.927E-18	1.444E-16	9.444E-15	5.573E-13	4.273E-11	1.438E-09	3.067E-08
U-238+D	äDSR(j)		2.823E-04	2.818E-04	2.808E-04	2.774E-04	2.676E-04	2.351E-04	1.577E-04	4.643E-05

The DSR includes contributions from associated (half-life ó 180 days) daughters.

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adult Trespasser
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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
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Ac-227 1.987E+04 2.061E+04 2.218E+04 2.867E+04 5.980E+04 8.003E+05 1.272E+09 *7.232E+13
Pa-231 1.985E+02 1.990E+02 2.000E+02 2.035E+02 2.142E+02 2.587E+02 4.490E+02 2.321E+03
Pb-210 4.742E+02 4.890E+02 5.200E+02 6.447E+02 1.191E+03 1.023E+04 4.785E+06 *7.634E+13
Ra-226 4.457E+02 4.333E+02 4.113E+02 3.564E+02 2.838E+02 2.347E+02 2.316E+02 2.420E+02
Th-230 2.911E+05 2.248E+05 1.525E+05 6.790E+04 2.316E+04 5.907E+03 1.742E+03 4.584E+02
U-234 1.697E+05 1.699E+05 1.704E+05 1.719E+05 1.765E+05 1.934E+05 2.411E+05 1.721E+05
U-235 6.830E+04 6.791E+04 6.716E+04 6.473E+04 5.913E+04 4.855E+04 4.370E+04 8.338E+04
U-238 8.855E+04 8.870E+04 8.901E+04 9.012E+04 9.340E+04 1.063E+05 1.586E+05 *3.361E+05
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*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) (pCi/g)	G(i,tmin) (pCi/g)	DSR(i,tmax) (pCi/g)	G(i,tmax) (pCi/g)
Ac-227	1.000E+00	0.000E+00	1.258E-03	1.987E+04	1.258E-03	1.987E+04
Pa-231	1.000E+00	0.000E+00	1.259E-01	1.985E+02	1.259E-01	1.985E+02
Pb-210	1.000E+00	0.000E+00	5.272E-02	4.742E+02	5.272E-02	4.742E+02
Ra-226	1.000E+00	187.5 ñ 0.4	1.084E-01	2.306E+02	5.609E-02	4.457E+02
Th-230	1.000E+00	1.000E+03	5.454E-02	4.584E+02	8.588E-05	2.911E+05
U-234	1.000E+00	0.000E+00	1.473E-04	1.697E+05	1.473E-04	1.697E+05
U-235	1.000E+00	247.7 ñ 0.5	5.776E-04	4.328E+04	3.660E-04	6.830E+04
U-238	1.000E+00	0.000E+00	2.823E-04	8.855E+04	2.823E-04	8.855E+04

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Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adult Trespasser
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Individual Nuclide Dose Summed Over All Pathways
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	DOSE(j,t), mrem/yr t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-227	Ac-227	1.000E+00	1.258E-03	1.213E-03	1.127E-03	8.720E-04	4.180E-04	3.124E-05	1.965E-08	8.059E-20
Ac-227	Pa-231	1.000E+00	3.840E-04	4.301E-04	5.025E-04	7.167E-04	1.088E-03	1.323E-03	1.015E-03	3.125E-04
Ac-227	U-235	1.000E+00	3.654E-09	1.232E-08	3.197E-08	1.219E-07	5.048E-07	2.270E-06	5.974E-06	6.514E-06
Ac-227	äDOSE(j)		1.642E-03	1.643E-03	1.630E-03	1.589E-03	1.506E-03	1.357E-03	1.021E-03	3.190E-04
Pa-231	Pa-231	1.000E+00	1.255E-01	1.252E-01	1.245E-01	1.221E-01	1.156E-01	9.532E-02	5.467E-02	1.046E-02
Pa-231	U-235	1.000E+00	1.188E-06	3.830E-06	9.078E-06	2.700E-05	7.450E-05	2.028E-04	3.486E-04	2.237E-04
Pa-231	äDOSE(j)		1.255E-01	1.252E-01	1.245E-01	1.222E-01	1.157E-01	9.552E-02	5.501E-02	1.068E-02
Pb-210	Pb-210	1.000E+00	5.272E-02	5.112E-02	4.808E-02	3.878E-02	2.098E-02	2.444E-03	5.225E-06	2.256E-15
Pb-210	Ra-226	1.000E+00	1.180E-03	2.801E-03	5.884E-03	1.530E-02	3.332E-02	5.209E-02	5.433E-02	5.119E-02
Pb-210	Th-230	1.000E+00	1.886E-07	1.054E-06	4.832E-06	3.751E-05	2.571E-04	1.672E-03	6.662E-03	2.613E-02
Pb-210	U-234	1.000E+00	4.639E-13	5.526E-12	5.437E-11	1.229E-09	2.486E-08	5.598E-07	6.352E-06	5.360E-05
Pb-210	U-238	9.999E-01	2.821E-19	6.927E-18	1.444E-16	9.444E-15	5.573E-13	4.273E-11	1.438E-09	3.067E-08
Pb-210	äDOSE(j)		5.390E-02	5.392E-02	5.397E-02	5.411E-02	5.456E-02	5.621E-02	6.100E-02	7.738E-02
Ra-226	Ra-226	1.000E+00	5.491E-02	5.490E-02	5.489E-02	5.486E-02	5.476E-02	5.444E-02	5.361E-02	5.211E-02
Ra-226	Th-230	1.000E+00	1.098E-05	3.475E-05	8.235E-05	2.491E-04	7.270E-04	2.417E-03	7.408E-03	2.767E-02
Ra-226	U-234	1.000E+00	3.168E-11	2.371E-10	1.287E-09	1.162E-08	9.678E-08	9.930E-07	7.627E-06	5.749E-05
Ra-226	U-238	9.999E-01	2.160E-17	3.517E-16	4.261E-15	1.144E-13	2.745E-12	8.975E-11	1.868E-09	3.346E-08
Ra-226	äDOSE(j)		5.492E-02	5.494E-02	5.497E-02	5.511E-02	5.549E-02	5.685E-02	6.103E-02	7.984E-02
Th-230	Th-230	1.000E+00	7.472E-05	7.541E-05	7.678E-05	8.159E-05	9.531E-05	1.431E-04	2.781E-04	7.323E-04
Th-230	U-234	1.000E+00	6.052E-10	1.290E-09	2.679E-09	7.856E-09	2.522E-08	1.114E-07	4.882E-07	2.019E-06
Th-230	U-238	9.999E-01	6.860E-16	3.383E-15	1.468E-14	1.204E-13	1.084E-12	1.507E-11	1.760E-10	1.572E-09
Th-230	äDOSE(j)		7.472E-05	7.541E-05	7.678E-05	8.160E-05	9.533E-05	1.432E-04	2.786E-04	7.343E-04
U-234	U-234	1.000E+00	1.473E-04	1.471E-04	1.467E-04	1.454E-04	1.415E-04	1.276E-04	8.924E-05	3.213E-05
U-234	U-238	9.999E-01	2.087E-10	6.255E-10	1.456E-09	4.328E-09	1.224E-08	3.635E-08	7.605E-08	9.125E-08
U-234	äDOSE(j)		1.473E-04	1.471E-04	1.467E-04	1.454E-04	1.415E-04	1.276E-04	8.931E-05	3.222E-05
U-235	U-235	1.000E+00	3.648E-04	3.643E-04	3.631E-04	3.591E-04	3.478E-04	3.099E-04	2.175E-04	6.960E-05
U-238	U-238	5.400E-05	7.303E-09	7.294E-09	7.275E-09	7.209E-09	7.016E-09	6.321E-09	4.417E-09	1.593E-09
U-238	U-238	9.999E-01	2.823E-04	2.818E-04	2.808E-04	2.774E-04	2.676E-04	2.351E-04	1.576E-04	4.628E-05
U-238	äDOSE(j)		2.823E-04	2.818E-04	2.809E-04	2.774E-04	2.676E-04	2.351E-04	1.576E-04	4.628E-05

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

Summary : NFSS VP H Prime Subsurface Soil (>0.15m) Adult Trespasser
File : C:\USERS\H5TDERJC\DESKTOP\NFSS\02 - VPH\13 - RISK ASSESSMENT\04 - RESRAD\FINAL\TR SUBSURFACE SOIL.RAD

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-227	Ac-227	1.000E+00	1.000E+00	9.611E-01	8.877E-01	6.724E-01	3.040E-01	1.888E-02	6.732E-06	5.762E-18
Ac-227	Pa-231	1.000E+00	0.000E+00	3.116E-02	8.960E-02	2.583E-01	5.275E-01	6.176E-01	3.354E-01	3.608E-02
Ac-227	U-235	1.000E+00	0.000E+00	3.317E-07	2.896E-06	2.899E-05	1.974E-04	9.846E-04	1.940E-03	7.501E-04
Ac-227	äS(j):		1.000E+00	9.922E-01	9.773E-01	9.307E-01	8.316E-01	6.375E-01	3.373E-01	3.683E-02
Pa-231	Pa-231	1.000E+00	1.000E+00	9.968E-01	9.905E-01	9.687E-01	9.089E-01	7.272E-01	3.846E-01	4.137E-02
Pa-231	U-235	1.000E+00	0.000E+00	2.109E-05	6.287E-05	2.050E-04	5.771E-04	1.540E-03	2.449E-03	8.847E-04
Pa-231	äS(j):		1.000E+00	9.968E-01	9.906E-01	9.689E-01	9.094E-01	7.288E-01	3.871E-01	4.226E-02
Pb-210	Pb-210	1.000E+00	1.000E+00	9.693E-01	9.108E-01	7.323E-01	3.927E-01	4.434E-02	8.718E-05	2.938E-14
Pb-210	Ra-226	1.000E+00	0.000E+00	3.060E-02	8.896E-02	2.665E-01	6.013E-01	9.236E-01	8.873E-01	6.533E-01
Pb-210	Th-230	1.000E+00	0.000E+00	6.662E-06	5.872E-05	6.075E-04	4.518E-03	2.939E-02	1.085E-01	3.332E-01
Pb-210	U-234	1.000E+00	0.000E+00	2.003E-11	5.315E-10	1.855E-08	4.263E-07	9.767E-06	1.033E-04	6.832E-04
Pb-210	U-238	9.999E-01	0.000E+00	1.421E-17	1.134E-15	1.329E-13	9.328E-12	7.402E-10	2.333E-08	3.907E-07
Pb-210	äS(j):		1.000E+00	9.999E-01	9.998E-01	9.993E-01	9.985E-01	9.974E-01	9.960E-01	9.872E-01
Ra-226	Ra-226	1.000E+00	1.000E+00	9.996E-01	9.987E-01	9.956E-01	9.870E-01	9.572E-01	8.770E-01	6.457E-01
Ra-226	Th-230	1.000E+00	0.000E+00	4.331E-04	1.299E-03	4.322E-03	1.290E-02	4.229E-02	1.210E-01	3.427E-01
Ra-226	U-234	1.000E+00	0.000E+00	1.948E-09	1.749E-08	1.926E-07	1.692E-06	1.731E-05	1.244E-04	7.118E-04
Ra-226	U-238	9.999E-01	0.000E+00	1.839E-15	4.949E-14	1.811E-12	4.728E-11	1.557E-09	3.043E-08	4.142E-07
Ra-226	äS(j):		1.000E+00	1.000E+00	1.000E+00	1.000E+00	9.999E-01	9.995E-01	9.981E-01	9.891E-01
Th-230	Th-230	1.000E+00	1.000E+00	1.000E+00	9.999E-01	9.996E-01	9.987E-01	9.956E-01	9.868E-01	9.567E-01
Th-230	U-234	1.000E+00	0.000E+00	8.987E-06	2.688E-05	8.859E-05	2.575E-04	7.698E-04	1.730E-03	2.637E-03
Th-230	U-238	9.999E-01	0.000E+00	1.273E-11	1.141E-10	1.249E-09	1.078E-08	1.035E-07	6.226E-07	2.051E-06
Th-230	äS(j):		1.000E+00	1.000E+00	9.999E-01	9.996E-01	9.989E-01	9.963E-01	9.885E-01	9.593E-01
U-234	U-234	1.000E+00	1.000E+00	9.968E-01	9.905E-01	9.688E-01	9.094E-01	7.286E-01	3.867E-01	4.214E-02
U-234	U-238	9.999E-01	0.000E+00	2.826E-06	8.424E-06	2.746E-05	7.734E-05	2.066E-04	3.290E-04	1.196E-04
U-234	äS(j):		1.000E+00	9.968E-01	9.906E-01	9.689E-01	9.094E-01	7.288E-01	3.871E-01	4.226E-02
U-235	U-235	1.000E+00	1.000E+00	9.968E-01	9.906E-01	9.689E-01	9.094E-01	7.288E-01	3.871E-01	4.226E-02
U-238	U-238	5.400E-05	5.400E-05	5.383E-05	5.349E-05	5.232E-05	4.911E-05	3.935E-05	2.090E-05	2.282E-06
U-238	U-238	9.999E-01	9.999E-01	9.968E-01	9.905E-01	9.688E-01	9.094E-01	7.287E-01	3.870E-01	4.226E-02
U-238	äS(j):		1.000E+00	9.968E-01	9.906E-01	9.689E-01	9.094E-01	7.288E-01	3.871E-01	4.226E-02

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

RESCALC.EXE execution time = 2.15 seconds

Intrisk : NFSS VP H Prime Subsurface Soil (>0.15m) Adult Trespasser
File : C:\USERS\H5TDERJC\DESKTOP\NFSS\02 - VPH\13 - RISK ASSESSMENT\04 - RESRAD\FINAL\TR SUBSURFACE SOIL.RAD

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Part III: Intake Quantities and Health Risk Factors

Cancer Risk Slope Factors Summary Table
Risk Library: FGR 13 Morbidity

Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-1	Ground external radiation slope factors, 1/yr per (pCi/g):			
Sf-1	Ac-227+D	1.47E-06	3.48E-10	SLPF(1,1)
Sf-1	Pa-231	1.39E-07	1.39E-07	SLPF(2,1)
Sf-1	Pb-210+D	4.21E-09	1.41E-09	SLPF(3,1)
Sf-1	Ra-226+D	8.49E-06	2.29E-08	SLPF(4,1)
Sf-1	Th-230	8.19E-10	8.19E-10	SLPF(5,1)
Sf-1	U-234	2.52E-10	2.52E-10	SLPF(6,1)
Sf-1	U-235+D	5.43E-07	5.18E-07	SLPF(7,1)
Sf-1	U-238	4.99E-11	4.99E-11	SLPF(8,1)
Sf-1	U-238+D	1.14E-07	4.99E-11	SLPF(9,1)
Sf-2	Inhalation, slope factors, 1/(pCi):			
Sf-2	Ac-227+D	2.13E-07	1.49E-07	SLPF(1,2)
Sf-2	Pa-231	7.62E-08	7.62E-08	SLPF(2,2)
Sf-2	Pb-210+D	3.08E-08	1.58E-08	SLPF(3,2)
Sf-2	Ra-226+D	2.83E-08	2.82E-08	SLPF(4,2)
Sf-2	Th-230	3.40E-08	3.40E-08	SLPF(5,2)
Sf-2	U-234	2.78E-08	2.78E-08	SLPF(6,2)
Sf-2	U-235+D	2.50E-08	2.50E-08	SLPF(7,2)
Sf-2	U-238	2.36E-08	2.36E-08	SLPF(8,2)
Sf-2	U-238+D	2.36E-08	2.36E-08	SLPF(9,2)
Sf-3	Food ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.53E-10	2.45E-10	SLPF(1,3)
Sf-3	Pa-231	2.26E-10	2.26E-10	SLPF(2,3)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF(3,3)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF(4,3)
Sf-3	Th-230	1.19E-10	1.19E-10	SLPF(5,3)
Sf-3	U-234	9.55E-11	9.55E-11	SLPF(6,3)
Sf-3	U-235+D	9.76E-11	9.44E-11	SLPF(7,3)
Sf-3	U-238	8.66E-11	8.66E-11	SLPF(8,3)
Sf-3	U-238+D	1.21E-10	8.66E-11	SLPF(9,3)
Sf-3	Water ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	4.86E-10	2.01E-10	SLPF(1,4)
Sf-3	Pa-231	1.73E-10	1.73E-10	SLPF(2,4)
Sf-3	Pb-210+D	2.66E-09	8.81E-10	SLPF(3,4)
Sf-3	Ra-226+D	3.86E-10	3.85E-10	SLPF(4,4)
Sf-3	Th-230	9.10E-11	9.10E-11	SLPF(5,4)
Sf-3	U-234	7.07E-11	7.07E-11	SLPF(6,4)
Sf-3	U-235+D	7.18E-11	6.96E-11	SLPF(7,4)
Sf-3	U-238	6.40E-11	6.40E-11	SLPF(8,4)
Sf-3	U-238+D	8.71E-11	6.40E-11	SLPF(9,4)
Sf-3	Soil ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.53E-10	2.45E-10	SLPF(1,5)
Sf-3	Pa-231	2.26E-10	2.26E-10	SLPF(2,5)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF(3,5)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF(4,5)
Sf-3	Th-230	1.19E-10	1.19E-10	SLPF(5,5)

Cancer Risk Slope Factors Summary Table (continued)
Risk Library: FGR 13 Morbidity

Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-3	U-234	9.55E-11	9.55E-11	SLPF(6,5)
Sf-3	U-235+D	9.76E-11	9.44E-11	SLPF(7,5)
Sf-3	U-238	8.66E-11	8.66E-11	SLPF(8,5)
Sf-3	U-238+D	1.21E-10	8.66E-11	SLPF(9,5)
Sf-Rn	Radon Inhalation slope factors, 1/(pCi):			
Sf-Rn	Rn-222	1.80E-12	1.80E-12	SLPFRN(1,1)
Sf-Rn	Po-218	3.70E-12	3.70E-12	SLPFRN(1,2)
Sf-Rn	Pb-214	6.20E-12	6.20E-12	SLPFRN(1,3)
Sf-Rn	Bi-214	1.50E-11	1.50E-11	SLPFRN(1,4)
Sf-Rn	Radon K factors, (mrem/WLM):			
Sf-Rn	Rn-222 Indoor	3.88E+02	3.88E+02	KFACTR(1,1)
Sf-Rn	Rn-222 Outdoor	3.88E+02	3.88E+02	KFACTR(1,2)

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

Risk Slope and Environmental Transport Factors for the Ground Pathway

Nuclide (i)	Slope(i)* t= 0.000E+00	ETFG(i,t) At Time in Years (dimensionless) 1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-227	3.480E-10	1.792E-04	1.795E-04	1.801E-04	1.822E-04	1.883E-04	2.112E-04	2.936E-04	9.287E-04
At-218	3.570E-09	6.006E-07	6.029E-07	6.076E-07	6.243E-07	6.748E-07	8.855E-07	1.925E-06	2.914E-05
Bi-210	2.760E-09	2.003E-04	2.006E-04	2.012E-04	2.031E-04	2.088E-04	2.300E-04	3.034E-04	7.988E-04
Bi-211	1.880E-07	6.483E-04	6.491E-04	6.505E-04	6.557E-04	6.708E-04	7.263E-04	9.114E-04	2.018E-03
Bi-214	7.480E-06	1.548E-03	1.549E-03	1.551E-03	1.560E-03	1.584E-03	1.674E-03	1.958E-03	3.390E-03
Fr-223	1.400E-07	3.328E-04	3.332E-04	3.341E-04	3.374E-04	3.468E-04	3.819E-04	5.030E-04	1.319E-03
Pa-231	1.390E-07	5.492E-04	5.499E-04	5.512E-04	5.559E-04	5.695E-04	6.196E-04	7.883E-04	1.832E-03
Pa-234	8.710E-06	1.159E-03	1.160E-03	1.162E-03	1.170E-03	1.191E-03	1.268E-03	1.518E-03	2.848E-03
Pa-234m	6.870E-08	9.582E-04	9.590E-04	9.608E-04	9.669E-04	9.847E-04	1.050E-03	1.260E-03	2.384E-03
Pb-210	1.410E-09	4.955E-09	4.984E-09	5.043E-09	5.253E-09	5.903E-09	8.880E-09	2.852E-08	1.692E-06
Pb-211	2.290E-07	9.647E-04	9.656E-04	9.675E-04	9.741E-04	9.933E-04	1.064E-03	1.293E-03	2.559E-03
Pb-214	9.820E-07	6.441E-04	6.448E-04	6.463E-04	6.515E-04	6.664E-04	7.215E-04	9.055E-04	2.004E-03
Po-210	3.950E-11	1.175E-03	1.176E-03	1.178E-03	1.186E-03	1.207E-03	1.285E-03	1.536E-03	2.869E-03
Po-211	3.580E-08	1.108E-03	1.109E-03	1.111E-03	1.118E-03	1.138E-03	1.214E-03	1.459E-03	2.774E-03
Po-214	3.860E-10	1.141E-03	1.142E-03	1.144E-03	1.151E-03	1.172E-03	1.249E-03	1.497E-03	2.821E-03
Po-215	7.480E-10	7.956E-04	7.965E-04	7.982E-04	8.040E-04	8.211E-04	8.839E-04	1.091E-03	2.277E-03
Po-218	4.260E-11	1.180E-03	1.182E-03	1.184E-03	1.191E-03	1.213E-03	1.291E-03	1.543E-03	2.882E-03
Ra-223	4.340E-07	3.690E-04	3.695E-04	3.705E-04	3.741E-04	3.844E-04	4.227E-04	5.546E-04	1.434E-03
Ra-226	2.290E-08	3.504E-04	3.509E-04	3.519E-04	3.553E-04	3.652E-04	4.024E-04	5.306E-04	1.397E-03
Rn-219	2.250E-07	6.614E-04	6.622E-04	6.637E-04	6.689E-04	6.842E-04	7.404E-04	9.278E-04	2.044E-03
Rn-222	1.740E-09	8.394E-04	8.402E-04	8.420E-04	8.481E-04	8.658E-04	9.307E-04	1.144E-03	2.359E-03
Th-227	3.780E-07	4.662E-04	4.668E-04	4.680E-04	4.722E-04	4.843E-04	5.293E-04	6.822E-04	1.658E-03
Th-230	8.190E-10	8.808E-05	8.825E-05	8.858E-05	8.977E-05	9.326E-05	1.066E-04	1.560E-04	5.926E-04
Th-231	2.450E-08	7.137E-05	7.151E-05	7.180E-05	7.281E-05	7.577E-05	8.713E-05	1.299E-04	5.248E-04
Th-234	1.630E-08	5.129E-05	5.140E-05	5.162E-05	5.240E-05	5.469E-05	6.351E-05	9.735E-05	4.342E-04
Tl-207	1.520E-08	7.110E-04	7.117E-04	7.131E-04	7.182E-04	7.328E-04	7.863E-04	9.618E-04	1.947E-03
Tl-210	0.000E+00	1.471E-03	1.472E-03	1.474E-03	1.483E-03	1.507E-03	1.594E-03	1.871E-03	3.284E-03
U-234	2.520E-10	5.938E-05	5.950E-05	5.974E-05	6.059E-05	6.307E-05	7.259E-05	1.085E-04	4.425E-04
U-235	5.180E-07	3.342E-04	3.347E-04	3.356E-04	3.389E-04	3.485E-04	3.845E-04	5.090E-04	1.359E-03
U-238	4.990E-11	1.602E-08	1.610E-08	1.627E-08	1.686E-08	1.867E-08	2.668E-08	7.399E-08	2.628E-06

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

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

	Water Independent Pathways (Inhalation w/o radon)				Water Dependent Pathways					
Radio-Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*	Total
Ac-227	0.000E+00	0.000E+00	4.781E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.781E-02	
Pa-231	0.000E+00	0.000E+00	4.781E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.781E+01	
Pb-210	0.000E+00	0.000E+00	7.650E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.650E+00	
Ra-226	0.000E+00	0.000E+00	3.825E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.825E+01	
Th-230	0.000E+00	0.000E+00	9.562E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.562E-02	
U-234	0.000E+00	0.000E+00	8.128E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.128E-01	
U-235	0.000E+00	0.000E+00	8.128E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.128E-01	
U-238	0.000E+00	0.000E+00	8.128E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.128E-01	

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.581E-08	0.0112	3.002E-11	0.0000	0.000E+00	0.0000	1.637E-09	0.0012	0.000E+00	0.0000	2.088E-11	0.0000
Pa-231	1.497E-09	0.0011	1.129E-11	0.0000	0.000E+00	0.0000	2.103E-07	0.1488	0.000E+00	0.0000	7.593E-12	0.0000
Pb-210	1.214E-11	0.0000	4.749E-12	0.0000	0.000E+00	0.0000	5.322E-07	0.3766	0.000E+00	0.0000	1.205E-10	0.0001
Ra-226	2.463E-07	0.1743	4.368E-12	0.0000	0.000E+00	0.0000	3.944E-07	0.2791	0.000E+00	0.0000	1.804E-11	0.0000
Th-230	1.470E-12	0.0000	5.251E-12	0.0000	0.000E+00	0.0000	2.357E-10	0.0002	0.000E+00	0.0000	4.168E-12	0.0000
U-234	2.959E-13	0.0000	4.119E-12	0.0000	0.000E+00	0.0000	1.527E-09	0.0011	0.000E+00	0.0000	3.208E-12	0.0000
U-235	3.436E-09	0.0024	3.704E-12	0.0000	0.000E+00	0.0000	1.561E-09	0.0011	0.000E+00	0.0000	3.280E-12	0.0000
U-238	1.952E-09	0.0014	3.501E-12	0.0000	0.000E+00	0.0000	1.928E-09	0.0014	0.000E+00	0.0000	4.052E-12	0.0000
Total	2.690E-07	0.1904	6.700E-11	0.0000	0.000E+00	0.0000	1.144E-06	0.8094	0.000E+00	0.0000	1.818E-10	0.0001

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

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.750E-08	0.0124
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.118E-07	0.1499
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.324E-07	0.3767
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.407E-07	0.4534
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.466E-10	0.0002
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.534E-09	0.0011
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.004E-09	0.0035
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.888E-09	0.0028
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.413E-06	1.0000

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

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

Radionuclides

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground risk	Ground fract.	Inhalation risk	Inhalation fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	Soil risk	Soil fract.
Ac-227	1.168E-08	0.0083	1.973E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.366E-10	0.0003	0.000E+00	0.0000	1.372E-11	0.0000
Pa-231	5.629E-09	0.0040	2.158E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.115E-07	0.1497	0.000E+00	0.0000	1.475E-11	0.0000
Pb-210	9.029E-12	0.0000	3.172E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.935E-07	0.2785	0.000E+00	0.0000	8.052E-11	0.0001
Ra-226	2.453E-07	0.1736	5.915E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.310E-07	0.3758	0.000E+00	0.0000	5.782E-11	0.0000
Th-230	1.068E-09	0.0008	5.281E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.355E-09	0.0017	0.000E+00	0.0000	4.409E-12	0.0000
U-234	3.591E-13	0.0000	4.119E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.527E-09	0.0011	0.000E+00	0.0000	3.209E-12	0.0000
U-235	3.437E-09	0.0024	3.709E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.605E-09	0.0011	0.000E+00	0.0000	3.284E-12	0.0000
U-238	1.952E-09	0.0014	3.501E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.928E-09	0.0014	0.000E+00	0.0000	4.052E-12	0.0000
Total	2.690E-07	0.1904	6.700E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.144E-06	0.8094	0.000E+00	0.0000	1.818E-10	0.0001

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

Water Dependent Pathways

Radio-Nuclide	Water risk	Water fract.	Fish risk	Fish fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	All pathways risk	All pathways fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.215E-08	0.0086
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.172E-07	0.1537
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.936E-07	0.2785
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.763E-07	0.5494
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.433E-09	0.0024
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.534E-09	0.0011
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.049E-09	0.0036
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.888E-09	0.0028
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.413E-06	1.0000

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

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

	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways				
Radio-Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*	Total
Ac-227	7.667E-07	0.000E+00	1.305E-01	0.000E+00	1.739E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.307E-01	
Pa-231	7.703E-07	0.000E+00	4.769E+01	0.000E+00	1.747E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.769E+01	
Pb-210	7.727E-07	0.000E+00	7.704E+00	0.000E+00	1.752E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.704E+00	
Ra-226	7.727E-07	0.000E+00	3.825E+01	0.000E+00	1.752E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.825E+01	
Th-230	7.727E-07	0.000E+00	9.594E-02	0.000E+00	1.752E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.612E-02	
U-234	7.703E-07	0.000E+00	8.115E-01	0.000E+00	1.747E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.117E-01	
U-235	7.703E-07	0.000E+00	8.115E-01	0.000E+00	1.747E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.117E-01	
U-238	7.703E-07	0.000E+00	8.115E-01	0.000E+00	1.747E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.117E-01	

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.573E-08	0.0111	3.288E-11	0.0000	0.000E+00	0.0000	1.643E-09	0.0012	0.000E+00	0.0000	2.287E-11	0.0000
Pa-231	1.494E-09	0.0011	1.239E-11	0.0000	0.000E+00	0.0000	2.098E-07	0.1484	0.000E+00	0.0000	8.334E-12	0.0000
Pb-210	1.216E-11	0.0000	5.223E-12	0.0000	0.000E+00	0.0000	5.325E-07	0.3768	0.000E+00	0.0000	1.326E-10	0.0001
Ra-226	2.465E-07	0.1745	4.805E-12	0.0000	0.000E+00	0.0000	3.945E-07	0.2792	0.000E+00	0.0000	1.984E-11	0.0000
Th-230	1.473E-12	0.0000	5.776E-12	0.0000	0.000E+00	0.0000	2.365E-10	0.0002	0.000E+00	0.0000	4.584E-12	0.0000
U-234	2.955E-13	0.0000	4.521E-12	0.0000	0.000E+00	0.0000	1.524E-09	0.0011	0.000E+00	0.0000	3.522E-12	0.0000
U-235	3.430E-09	0.0024	4.066E-12	0.0000	0.000E+00	0.0000	1.558E-09	0.0011	0.000E+00	0.0000	3.600E-12	0.0000
U-238	1.948E-09	0.0014	3.843E-12	0.0000	0.000E+00	0.0000	1.925E-09	0.0014	0.000E+00	0.0000	4.448E-12	0.0000
Total	2.691E-07	0.1905	7.351E-11	0.0001	0.000E+00	0.0000	1.144E-06	0.8093	0.000E+00	0.0000	1.998E-10	0.0001

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

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.743E-08	0.0123
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.113E-07	0.1495
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.326E-07	0.3769
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.410E-07	0.4537
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.483E-10	0.0002
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.532E-09	0.0011
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.996E-09	0.0035
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.881E-09	0.0027
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.413E-06	1.0000

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground risk	Ground fract.	Inhalation risk	Inhalation fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	Soil risk	Soil fract.
Ac-227	1.124E-08	0.0080	2.114E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.203E-10	0.0003	0.000E+00	0.0000	1.471E-11	0.0000
Pa-231	5.983E-09	0.0042	2.413E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.109E-07	0.1493	0.000E+00	0.0000	1.650E-11	0.0000
Pb-210	8.764E-12	0.0000	3.417E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.816E-07	0.2701	0.000E+00	0.0000	8.675E-11	0.0001
Ra-226	2.454E-07	0.1736	6.575E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.430E-07	0.3843	0.000E+00	0.0000	6.540E-11	0.0000
Th-230	1.175E-09	0.0008	5.811E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.589E-09	0.0018	0.000E+00	0.0000	4.871E-12	0.0000
U-234	3.687E-13	0.0000	4.521E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.524E-09	0.0011	0.000E+00	0.0000	3.522E-12	0.0000
U-235	3.431E-09	0.0024	4.071E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.607E-09	0.0011	0.000E+00	0.0000	3.604E-12	0.0000
U-238	1.948E-09	0.0014	3.843E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.925E-09	0.0014	0.000E+00	0.0000	4.448E-12	0.0000
Total	2.691E-07	0.1905	7.351E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	1.144E-06	0.8093	0.000E+00	0.0000	1.998E-10	0.0001

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

Water Dependent Pathways

Radio-Nuclide	Water risk	Water fract.	Fish risk	Fish fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	All pathways risk	All pathways fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.170E-08	0.0083
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.170E-07	0.1535
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.817E-07	0.2701
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.884E-07	0.5580
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.775E-09	0.0027
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.533E-09	0.0011
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.046E-09	0.0036
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.881E-09	0.0027
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.413E-06	1.0000

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

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

	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways				
Radio-Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*	Total
Ac-227	2.265E-06	0.000E+00	1.295E-01	0.000E+00	5.137E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.300E-01	
Pa-231	2.296E-06	0.000E+00	4.743E+01	0.000E+00	5.207E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.743E+01	
Pb-210	2.317E-06	0.000E+00	7.710E+00	0.000E+00	5.255E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.710E+00	
Ra-226	2.318E-06	0.000E+00	3.827E+01	0.000E+00	5.256E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.827E+01	
Th-230	2.318E-06	0.000E+00	9.663E-02	0.000E+00	5.256E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.715E-02	
U-234	2.296E-06	0.000E+00	8.088E-01	0.000E+00	5.207E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.093E-01	
U-235	2.296E-06	0.000E+00	8.088E-01	0.000E+00	5.207E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.093E-01	
U-238	2.296E-06	0.000E+00	8.088E-01	0.000E+00	5.207E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.093E-01	

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Plant		Meat		Milk		Soil		
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	
Ac-227	1.556E-08	0.0110	3.851E-11	0.0000	0.000E+00	0.0000	1.631E-09	0.0012	0.000E+00	0.0000	2.678E-11	0.0000	
Pa-231	1.489E-09	0.0011	1.457E-11	0.0000	0.000E+00	0.0000	2.086E-07	0.1477	0.000E+00	0.0000	9.801E-12	0.0000	
Pb-210	1.219E-11	0.0000	6.172E-12	0.0000	0.000E+00	0.0000	5.329E-07	0.3772	0.000E+00	0.0000	1.567E-10	0.0001	
Ra-226	2.469E-07	0.1748	5.679E-12	0.0000	0.000E+00	0.0000	3.946E-07	0.2793	0.000E+00	0.0000	2.345E-11	0.0000	
Th-230	1.478E-12	0.0000	6.826E-12	0.0000	0.000E+00	0.0000	2.381E-10	0.0002	0.000E+00	0.0000	5.418E-12	0.0000	
U-234	2.948E-13	0.0000	5.317E-12	0.0000	0.000E+00	0.0000	1.519E-09	0.0011	0.000E+00	0.0000	4.142E-12	0.0000	
U-235	3.418E-09	0.0024	4.782E-12	0.0000	0.000E+00	0.0000	1.553E-09	0.0011	0.000E+00	0.0000	4.235E-12	0.0000	
U-238	1.939E-09	0.0014	4.520E-12	0.0000	0.000E+00	0.0000	1.918E-09	0.0014	0.000E+00	0.0000	5.231E-12	0.0000	
Total	2.694E-07	0.1907	8.637E-11	0.0001	0.000E+00	0.0000	1.143E-06	0.8091	0.000E+00	0.0000	2.357E-10	0.0002	

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

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.726E-08	0.0122
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.101E-07	0.1488
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.330E-07	0.3773
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.415E-07	0.4542
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.518E-10	0.0002
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.529E-09	0.0011
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.980E-09	0.0035
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.867E-09	0.0027
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.413E-06	1.0000

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

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

Radionuclides

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground risk	Ground fract.	Inhalation risk	Inhalation fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	Soil risk	Soil fract.
Ac-227	1.041E-08	0.0074	2.356E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.893E-10	0.0003	0.000E+00	0.0000	1.639E-11	0.0000
Pa-231	6.646E-09	0.0047	2.951E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.098E-07	0.1485	0.000E+00	0.0000	2.019E-11	0.0000
Pb-210	8.257E-12	0.0000	3.855E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.589E-07	0.2540	0.000E+00	0.0000	9.786E-11	0.0001
Ra-226	2.455E-07	0.1738	7.949E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.658E-07	0.4005	0.000E+00	0.0000	8.188E-11	0.0001
Th-230	1.390E-09	0.0010	6.873E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.072E-09	0.0022	0.000E+00	0.0000	5.811E-12	0.0000
U-234	3.907E-13	0.0000	5.318E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.519E-09	0.0011	0.000E+00	0.0000	4.142E-12	0.0000
U-235	3.420E-09	0.0024	4.789E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.610E-09	0.0011	0.000E+00	0.0000	4.240E-12	0.0000
U-238	1.939E-09	0.0014	4.520E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.918E-09	0.0014	0.000E+00	0.0000	5.231E-12	0.0000
Total	2.694E-07	0.1907	8.637E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	1.143E-06	0.8091	0.000E+00	0.0000	2.357E-10	0.0002

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

Water Dependent Pathways

Radio-Nuclide	Water risk	Water fract.	Fish risk	Fish fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	All pathways risk	All pathways fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.084E-08	0.0077
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.165E-07	0.1533
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.590E-07	0.2541
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.114E-07	0.5744
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.474E-09	0.0032
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.529E-09	0.0011
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.039E-09	0.0036
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.867E-09	0.0027
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.413E-06	1.0000

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

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

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	7.191E-06	0.000E+00	1.261E-01	0.000E+00	1.631E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.278E-01
Pa-231	7.486E-06	0.000E+00	4.653E+01	0.000E+00	1.697E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.653E+01
Pb-210	7.721E-06	0.000E+00	7.730E+00	0.000E+00	1.751E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.731E+00
Ra-226	7.726E-06	0.000E+00	3.831E+01	0.000E+00	1.752E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.831E+01
Th-230	7.723E-06	0.000E+00	9.902E-02	0.000E+00	1.751E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.008E-01
U-234	7.486E-06	0.000E+00	7.993E-01	0.000E+00	1.697E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.010E-01
U-235	7.486E-06	0.000E+00	7.993E-01	0.000E+00	1.697E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.010E-01
U-238	7.486E-06	0.000E+00	7.993E-01	0.000E+00	1.697E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.010E-01

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

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

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.505E-08	0.0107	5.720E-11	0.0000	0.000E+00	0.0000	1.593E-09	0.0011	0.000E+00	0.0000	3.979E-11	0.0000
Pa-231	1.468E-09	0.0010	2.199E-11	0.0000	0.000E+00	0.0000	2.047E-07	0.1450	0.000E+00	0.0000	1.479E-11	0.0000
Pb-210	1.230E-11	0.0000	9.493E-12	0.0000	0.000E+00	0.0000	5.343E-07	0.3786	0.000E+00	0.0000	2.410E-10	0.0002
Ra-226	2.483E-07	0.1759	8.736E-12	0.0000	0.000E+00	0.0000	3.950E-07	0.2799	0.000E+00	0.0000	3.607E-11	0.0000
Th-230	1.498E-12	0.0000	1.050E-11	0.0000	0.000E+00	0.0000	2.438E-10	0.0002	0.000E+00	0.0000	8.333E-12	0.0000
U-234	2.925E-13	0.0000	8.024E-12	0.0000	0.000E+00	0.0000	1.501E-09	0.0011	0.000E+00	0.0000	6.250E-12	0.0000
U-235	3.377E-09	0.0024	7.216E-12	0.0000	0.000E+00	0.0000	1.534E-09	0.0011	0.000E+00	0.0000	6.390E-12	0.0000
U-238	1.909E-09	0.0014	6.820E-12	0.0000	0.000E+00	0.0000	1.895E-09	0.0013	0.000E+00	0.0000	7.894E-12	0.0000
Total	2.701E-07	0.1914	1.300E-10	0.0001	0.000E+00	0.0000	1.141E-06	0.8083	0.000E+00	0.0000	3.605E-10	0.0003

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

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.674E-08	0.0119
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.062E-07	0.1461
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.346E-07	0.3787
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.434E-07	0.4559
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.641E-10	0.0002
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.515E-09	0.0011
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.925E-09	0.0035
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.819E-09	0.0027
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.411E-06	1.0000

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

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

Radionuclides

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground risk	Ground fract.	Inhalation risk	Inhalation fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	Soil risk	Soil fract.
Ac-227	7.946E-09	0.0056	2.853E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.979E-10	0.0002	0.000E+00	0.0000	1.984E-11	0.0000
Pa-231	8.570E-09	0.0061	5.065E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.059E-07	0.1459	0.000E+00	0.0000	3.473E-11	0.0000
Pb-210	6.702E-12	0.0000	4.913E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.894E-07	0.2051	0.000E+00	0.0000	1.247E-10	0.0001
Ra-226	2.462E-07	0.1744	1.321E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.353E-07	0.4501	0.000E+00	0.0000	1.514E-10	0.0001
Th-230	2.145E-09	0.0015	1.060E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.907E-09	0.0035	0.000E+00	0.0000	9.308E-12	0.0000
U-234	4.973E-13	0.0000	8.025E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.501E-09	0.0011	0.000E+00	0.0000	6.251E-12	0.0000
U-235	3.379E-09	0.0024	7.234E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.621E-09	0.0011	0.000E+00	0.0000	6.402E-12	0.0000
U-238	1.909E-09	0.0014	6.821E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.896E-09	0.0013	0.000E+00	0.0000	7.894E-12	0.0000
Total	2.701E-07	0.1914	1.300E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	1.141E-06	0.8083	0.000E+00	0.0000	3.605E-10	0.0003

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

Water Dependent Pathways

Radio-Nuclide	Water risk	Water fract.	Fish risk	Fish fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	All pathways risk	All pathways fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.292E-09	0.0059
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.145E-07	0.1520
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.895E-07	0.2052
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.816E-07	0.6246
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.072E-09	0.0050
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.516E-09	0.0011
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.014E-09	0.0036
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.819E-09	0.0027
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.411E-06	1.0000

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

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 3.000E+01 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways				Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.928E-05	0.000E+00	1.182E-01	0.000E+00	4.371E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.226E-01
Pa-231	2.108E-05	0.000E+00	4.405E+01	0.000E+00	4.780E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.406E+01
Pb-210	2.314E-05	0.000E+00	7.789E+00	0.000E+00	5.248E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.794E+00
Ra-226	2.318E-05	0.000E+00	3.843E+01	0.000E+00	5.255E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.844E+01
Th-230	2.315E-05	0.000E+00	1.058E-01	0.000E+00	5.250E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.111E-01
U-234	2.108E-05	0.000E+00	7.723E-01	0.000E+00	4.780E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.771E-01
U-235	2.108E-05	0.000E+00	7.723E-01	0.000E+00	4.780E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.771E-01
U-238	2.108E-05	0.000E+00	7.723E-01	0.000E+00	4.780E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.771E-01

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

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 3.000E+01 years

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

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

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.395E-08	0.0099	1.042E-10	0.0001	0.000E+00	0.0000	1.500E-09	0.0011	0.000E+00	0.0000	7.249E-11	0.0001
Pa-231	1.412E-09	0.0010	4.140E-11	0.0000	0.000E+00	0.0000	1.938E-07	0.1375	0.000E+00	0.0000	2.784E-11	0.0000
Pb-210	1.263E-11	0.0000	1.898E-11	0.0000	0.000E+00	0.0000	5.385E-07	0.3822	0.000E+00	0.0000	4.817E-10	0.0003
Ra-226	2.523E-07	0.1791	1.747E-11	0.0000	0.000E+00	0.0000	3.963E-07	0.2813	0.000E+00	0.0000	7.213E-11	0.0001
Th-230	1.555E-12	0.0000	2.098E-11	0.0000	0.000E+00	0.0000	2.600E-10	0.0002	0.000E+00	0.0000	1.665E-11	0.0000
U-234	2.858E-13	0.0000	1.510E-11	0.0000	0.000E+00	0.0000	1.450E-09	0.0010	0.000E+00	0.0000	1.176E-11	0.0000
U-235	3.260E-09	0.0023	1.358E-11	0.0000	0.000E+00	0.0000	1.482E-09	0.0011	0.000E+00	0.0000	1.203E-11	0.0000
U-238	1.825E-09	0.0013	1.284E-11	0.0000	0.000E+00	0.0000	1.831E-09	0.0013	0.000E+00	0.0000	1.486E-11	0.0000
Total	2.728E-07	0.1936	2.446E-10	0.0002	0.000E+00	0.0000	1.135E-06	0.8057	0.000E+00	0.0000	7.095E-10	0.0005

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.563E-08	0.0111
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.952E-07	0.1386
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.390E-07	0.3826
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.487E-07	0.4605
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.992E-10	0.0002
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.477E-09	0.0010
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.768E-09	0.0034
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.683E-09	0.0026
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.409E-06	1.0000

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

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+01 years

Radionuclides

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

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground risk	Ground fract.	Inhalation risk	Inhalation fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	Soil risk	Soil fract.
Ac-227	3.677E-09	0.0026	2.670E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.386E-10	0.0001	0.000E+00	0.0000	1.857E-11	0.0000
Pa-231	1.168E-08	0.0083	1.188E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	1.950E-07	0.1384	0.000E+00	0.0000	8.171E-11	0.0001
Pb-210	3.692E-12	0.0000	5.412E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.565E-07	0.1111	0.000E+00	0.0000	1.374E-10	0.0001
Ra-226	2.480E-07	0.1760	3.058E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.675E-07	0.5448	0.000E+00	0.0000	4.115E-10	0.0003
Th-230	4.335E-09	0.0031	2.143E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.109E-08	0.0079	0.000E+00	0.0000	2.161E-11	0.0000
U-234	1.052E-12	0.0000	1.511E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.451E-09	0.0010	0.000E+00	0.0000	1.177E-11	0.0000
U-235	3.267E-09	0.0023	1.366E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.646E-09	0.0012	0.000E+00	0.0000	1.208E-11	0.0000
U-238	1.825E-09	0.0013	1.284E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.831E-09	0.0013	0.000E+00	0.0000	1.486E-11	0.0000
Total	2.728E-07	0.1936	2.446E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	1.135E-06	0.8057	0.000E+00	0.0000	7.095E-10	0.0005

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

Water Dependent Pathways

Radio-Nuclide	Water risk	Water fract.	Fish risk	Fish fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	All pathways risk	All pathways fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.860E-09	0.0027
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.068E-07	0.1468
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.567E-07	0.1112
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.016E-06	0.7211
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.547E-08	0.0110
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.479E-09	0.0010
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.939E-09	0.0035
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.684E-09	0.0026
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.409E-06	1.0000

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

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

	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways				
Radio-Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*	Total
Ac-227	4.926E-05	0.000E+00	9.829E-02	0.000E+00	1.117E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.095E-01	
Pa-231	5.631E-05	0.000E+00	3.636E+01	0.000E+00	1.277E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.637E+01	
Pb-210	7.706E-05	0.000E+00	8.012E+00	0.000E+00	1.747E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.030E+00	
Ra-226	7.723E-05	0.000E+00	3.887E+01	0.000E+00	1.751E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.889E+01	
Th-230	7.698E-05	0.000E+00	1.296E-01	0.000E+00	1.746E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.471E-01	
U-234	5.631E-05	0.000E+00	6.808E-01	0.000E+00	1.277E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.935E-01	
U-235	5.631E-05	0.000E+00	6.808E-01	0.000E+00	1.277E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.935E-01	
U-238	5.631E-05	0.000E+00	6.808E-01	0.000E+00	1.277E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.935E-01	

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

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

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

Water-ind. == Water-independent Water-dep. == Water-dependent

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.175E-08	0.0083	2.230E-10	0.0002	0.000E+00	0.0000	1.252E-09	0.0009	0.000E+00	0.0000	1.552E-10	0.0001
Pa-231	1.231E-09	0.0009	9.138E-11	0.0001	0.000E+00	0.0000	1.599E-07	0.1136	0.000E+00	0.0000	6.146E-11	0.0000
Pb-210	1.386E-11	0.0000	5.213E-11	0.0000	0.000E+00	0.0000	5.539E-07	0.3937	0.000E+00	0.0000	1.323E-09	0.0009
Ra-226	2.668E-07	0.1896	4.803E-11	0.0000	0.000E+00	0.0000	4.008E-07	0.2849	0.000E+00	0.0000	1.983E-10	0.0001
Th-230	1.772E-12	0.0000	5.756E-11	0.0000	0.000E+00	0.0000	3.166E-10	0.0002	0.000E+00	0.0000	4.568E-11	0.0000
U-234	2.636E-13	0.0000	3.334E-11	0.0000	0.000E+00	0.0000	1.276E-09	0.0009	0.000E+00	0.0000	2.597E-11	0.0000
U-235	2.883E-09	0.0020	2.998E-11	0.0000	0.000E+00	0.0000	1.305E-09	0.0009	0.000E+00	0.0000	2.655E-11	0.0000
U-238	1.560E-09	0.0011	2.834E-11	0.0000	0.000E+00	0.0000	1.612E-09	0.0011	0.000E+00	0.0000	3.280E-11	0.0000
Total	2.842E-07	0.2020	5.638E-10	0.0004	0.000E+00	0.0000	1.120E-06	0.7963	0.000E+00	0.0000	1.869E-09	0.0013

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.338E-08	0.0095
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.613E-07	0.1146
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.553E-07	0.3947
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.679E-07	0.4746
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.216E-10	0.0003
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.336E-09	0.0009
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.245E-09	0.0030
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.232E-09	0.0023
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.407E-06	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+02 years

Radon	Radionuclides						
Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground risk	Ground fract.	Inhalation risk	Inhalation fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	Soil risk	Soil fract.
Ac-227	2.477E-10	0.0002	4.659E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.460E-12	0.0000	0.000E+00	0.0000	3.241E-12	0.0000
Pa-231	1.271E-08	0.0090	3.092E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	1.608E-07	0.1143	0.000E+00	0.0000	2.130E-10	0.0002
Pb-210	4.581E-13	0.0000	1.709E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.820E-08	0.0129	0.000E+00	0.0000	4.338E-11	0.0000
Ra-226	2.544E-07	0.1808	9.446E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	8.993E-07	0.6391	0.000E+00	0.0000	1.425E-09	0.0010
Th-230	1.239E-08	0.0088	6.150E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.752E-08	0.0267	0.000E+00	0.0000	9.936E-11	0.0001
U-234	5.805E-12	0.0000	3.338E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.291E-09	0.0009	0.000E+00	0.0000	2.602E-11	0.0000
U-235	2.907E-09	0.0021	3.059E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.679E-09	0.0012	0.000E+00	0.0000	2.697E-11	0.0000
U-238	1.560E-09	0.0011	2.835E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.612E-09	0.0011	0.000E+00	0.0000	3.281E-11	0.0000
Total	2.842E-07	0.2020	5.638E-10	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	1.120E-06	0.7963	0.000E+00	0.0000	1.869E-09	0.0013

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Dependent Pathways

Radio-Nuclide	Water risk	Water fract.	Fish risk	Fish fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	All pathways risk	All pathways fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.651E-10	0.0002
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.740E-07	0.1237
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.825E-08	0.0130
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.155E-06	0.8210
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.008E-08	0.0356
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.356E-09	0.0010
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.643E-09	0.0033
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.233E-09	0.0023
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.407E-06	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 3.000E+02 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways				Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	7.818E-05	0.000E+00	5.973E-02	0.000E+00	1.773E-02	0.000E+00	0.000E+00	0.000E+00	9.766E-05	0.000E+00	7.756E-02
Pa-231	8.972E-05	0.000E+00	2.091E+01	0.000E+00	2.034E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.093E+01
Pb-210	2.309E-04	0.000E+00	8.662E+00	0.000E+00	5.235E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.714E+00
Ra-226	2.314E-04	0.000E+00	4.010E+01	0.000E+00	5.246E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.015E+01
Th-230	2.291E-04	0.000E+00	1.969E-01	0.000E+00	5.196E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.488E-01
U-234	8.972E-05	0.000E+00	4.555E-01	0.000E+00	2.034E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.758E-01
U-235	8.972E-05	0.000E+00	4.555E-01	0.000E+00	2.034E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.758E-01
U-238	8.972E-05	0.000E+00	4.555E-01	0.000E+00	2.034E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.758E-01

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 3.000E+02 years

Radon	Radionuclides							
Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	7.854E-09	0.0055	3.332E-10	0.0002	0.000E+00	0.0000	7.606E-10	0.0005	0.000E+00	0.0000	2.317E-10	0.0002
Pa-231	8.319E-10	0.0006	1.369E-10	0.0001	0.000E+00	0.0000	9.194E-08	0.0639	0.000E+00	0.0000	9.204E-11	0.0001
Pb-210	1.813E-11	0.0000	1.467E-10	0.0001	0.000E+00	0.0000	5.987E-07	0.4161	0.000E+00	0.0000	3.724E-09	0.0026
Ra-226	3.129E-07	0.2175	1.352E-10	0.0001	0.000E+00	0.0000	4.135E-07	0.2874	0.000E+00	0.0000	5.580E-10	0.0004
Th-230	2.574E-12	0.0000	1.609E-10	0.0001	0.000E+00	0.0000	4.765E-10	0.0003	0.000E+00	0.0000	1.277E-10	0.0001
U-234	2.092E-13	0.0000	4.993E-11	0.0000	0.000E+00	0.0000	8.516E-10	0.0006	0.000E+00	0.0000	3.889E-11	0.0000
U-235	2.030E-09	0.0014	4.490E-11	0.0000	0.000E+00	0.0000	8.707E-10	0.0006	0.000E+00	0.0000	3.977E-11	0.0000
U-238	9.957E-10	0.0007	4.244E-11	0.0000	0.000E+00	0.0000	1.076E-09	0.0007	0.000E+00	0.0000	4.912E-11	0.0000
Total	3.246E-07	0.2257	1.050E-09	0.0007	0.000E+00	0.0000	1.108E-06	0.7702	0.000E+00	0.0000	4.862E-09	0.0034

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.557E-12	0.0000	0.000E+00	0.0000	9.182E-09	0.0064
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.300E-08	0.0646
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.026E-07	0.4188
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.271E-07	0.5054
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.678E-10	0.0005
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.406E-10	0.0007
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.985E-09	0.0021
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.163E-09	0.0015
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.557E-12	0.0000	0.000E+00	0.0000	1.439E-06	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+02 years

Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground risk	Ground fract.	Inhalation risk	Inhalation fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	Soil risk	Soil fract.
Ac-227	1.115E-13	0.0000	4.718E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.239E-15	0.0000	0.000E+00	0.0000	3.282E-15	0.0000
Pa-231	8.634E-09	0.0060	4.671E-10	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	9.210E-08	0.0640	0.000E+00	0.0000	3.218E-10	0.0002
Pb-210	1.179E-15	0.0000	9.526E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.875E-11	0.0000	0.000E+00	0.0000	2.418E-13	0.0000
Ra-226	2.738E-07	0.1903	2.484E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	8.928E-07	0.6206	0.000E+00	0.0000	3.792E-09	0.0026
Th-230	3.911E-08	0.0272	1.941E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	1.197E-07	0.0832	0.000E+00	0.0000	6.173E-10	0.0004
U-234	4.143E-11	0.0000	5.021E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.722E-10	0.0007	0.000E+00	0.0000	3.957E-11	0.0000
U-235	2.082E-09	0.0014	4.779E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.476E-09	0.0010	0.000E+00	0.0000	4.175E-11	0.0000
U-238	9.957E-10	0.0007	4.249E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.076E-09	0.0007	0.000E+00	0.0000	4.916E-11	0.0000
Total	3.246E-07	0.2257	1.050E-09	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	1.108E-06	0.7702	0.000E+00	0.0000	4.862E-09	0.0034

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Dependent Pathways

Radio-Nuclide	Water risk	Water fract.	Fish risk	Fish fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	All pathways risk	All pathways fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.453E-15	0.0000	0.000E+00	0.0000	1.302E-13	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.545E-12	0.0000	0.000E+00	0.0000	1.015E-07	0.0706
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.900E-11	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.171E-06	0.8137
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.596E-07	0.1109
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.103E-09	0.0008
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.454E-15	0.0000	0.000E+00	0.0000	3.648E-09	0.0025
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.164E-09	0.0015
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.557E-12	0.0000	0.000E+00	0.0000	1.439E-06	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.000E+03 years

Radio-	Water Independent Pathways (Inhalation w/o radon)				Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	2.845E-05	0.000E+00	9.424E-03	0.000E+00	6.452E-03	0.000E+00	0.000E+00	0.000E+00	1.381E-02	0.000E+00	2.969E-02
Pa-231	3.265E-05	0.000E+00	2.896E+00	0.000E+00	7.404E-03	0.000E+00	0.000E+00	0.000E+00	1.154E+00	0.000E+00	4.058E+00
Pb-210	7.628E-04	0.000E+00	1.088E+01	0.000E+00	1.730E-01	0.000E+00	0.000E+00	0.000E+00	7.809E-07	0.000E+00	1.105E+01
Ra-226	7.642E-04	0.000E+00	4.420E+01	0.000E+00	1.733E-01	0.000E+00	0.000E+00	0.000E+00	6.382E-08	0.000E+00	4.437E+01
Th-230	7.412E-04	0.000E+00	4.229E-01	0.000E+00	1.681E-01	0.000E+00	0.000E+00	0.000E+00	7.578E-07	0.000E+00	5.910E-01
U-234	3.265E-05	0.000E+00	8.561E-02	0.000E+00	7.404E-03	0.000E+00	0.000E+00	0.000E+00	7.849E-02	0.000E+00	1.715E-01
U-235	3.265E-05	0.000E+00	8.561E-02	0.000E+00	7.404E-03	0.000E+00	0.000E+00	0.000E+00	7.849E-02	0.000E+00	1.715E-01
U-238	3.265E-05	0.000E+00	8.561E-02	0.000E+00	7.404E-03	0.000E+00	0.000E+00	0.000E+00	7.849E-02	0.000E+00	1.715E-01

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.000E+03 years

Radon	Radionuclides							
Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.950E-09	0.0011	1.185E-10	0.0001	0.000E+00	0.0000	1.198E-10	0.0001	0.000E+00	0.0000	8.246E-11	0.0000
Pa-231	2.111E-10	0.0001	4.870E-11	0.0000	0.000E+00	0.0000	1.272E-08	0.0071	0.000E+00	0.0000	3.275E-11	0.0000
Pb-210	4.644E-11	0.0000	4.738E-10	0.0003	0.000E+00	0.0000	7.513E-07	0.4193	0.000E+00	0.0000	1.203E-08	0.0067
Ra-226	5.456E-07	0.3045	4.363E-10	0.0002	0.000E+00	0.0000	4.556E-07	0.2542	0.000E+00	0.0000	1.802E-09	0.0010
Th-230	9.488E-12	0.0000	5.088E-10	0.0003	0.000E+00	0.0000	1.014E-09	0.0006	0.000E+00	0.0000	4.038E-10	0.0002
U-234	9.316E-14	0.0000	1.777E-11	0.0000	0.000E+00	0.0000	1.594E-10	0.0001	0.000E+00	0.0000	1.384E-11	0.0000
U-235	5.952E-10	0.0003	1.598E-11	0.0000	0.000E+00	0.0000	1.630E-10	0.0001	0.000E+00	0.0000	1.415E-11	0.0000
U-238	2.086E-10	0.0001	1.510E-11	0.0000	0.000E+00	0.0000	2.013E-10	0.0001	0.000E+00	0.0000	1.748E-11	0.0000
Total	5.487E-07	0.3062	1.635E-09	0.0009	0.000E+00	0.0000	1.221E-06	0.6815	0.000E+00	0.0000	1.439E-08	0.0080

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.816E-10	0.0001	0.000E+00	0.0000	2.452E-09	0.0014
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.257E-09	0.0029	0.000E+00	0.0000	1.827E-08	0.0102
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.660E-14	0.0000	0.000E+00	0.0000	7.638E-07	0.4263
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.892E-16	0.0000	0.000E+00	0.0000	1.003E-06	0.5600
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.855E-15	0.0000	0.000E+00	0.0000	1.936E-09	0.0011
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.510E-10	0.0001	0.000E+00	0.0000	3.421E-10	0.0002
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.544E-10	0.0001	0.000E+00	0.0000	9.427E-10	0.0005
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.908E-10	0.0001	0.000E+00	0.0000	6.332E-10	0.0004
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.935E-09	0.0033	0.000E+00	0.0000	1.792E-06	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+03 years

Radon	Radionuclides						
Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground risk	Ground fract.	Inhalation risk	Inhalation fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	Soil risk	Soil fract.
Ac-227	2.170E-25	0.0000	1.319E-26	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.221E-27	0.0000	0.000E+00	0.0000	9.178E-27	0.0000
Pa-231	2.116E-09	0.0012	1.638E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	1.257E-08	0.0070	0.000E+00	0.0000	1.128E-10	0.0001
Pb-210	1.027E-24	0.0000	1.048E-23	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.655E-20	0.0000	0.000E+00	0.0000	2.661E-22	0.0000
Ra-226	3.547E-07	0.1980	5.959E-10	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	7.912E-07	0.4416	0.000E+00	0.0000	9.097E-09	0.0051
Th-230	1.906E-07	0.1063	8.210E-10	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	4.158E-07	0.2320	0.000E+00	0.0000	5.125E-09	0.0029
U-234	3.974E-10	0.0002	1.976E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.020E-09	0.0006	0.000E+00	0.0000	2.465E-11	0.0000
U-235	6.398E-10	0.0004	1.945E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.344E-10	0.0002	0.000E+00	0.0000	1.654E-11	0.0000
U-238	2.088E-10	0.0001	1.515E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.023E-10	0.0001	0.000E+00	0.0000	1.752E-11	0.0000
Total	5.487E-07	0.3062	1.635E-09	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	1.221E-06	0.6815	0.000E+00	0.0000	1.439E-08	0.0080

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

Water Dependent Pathways

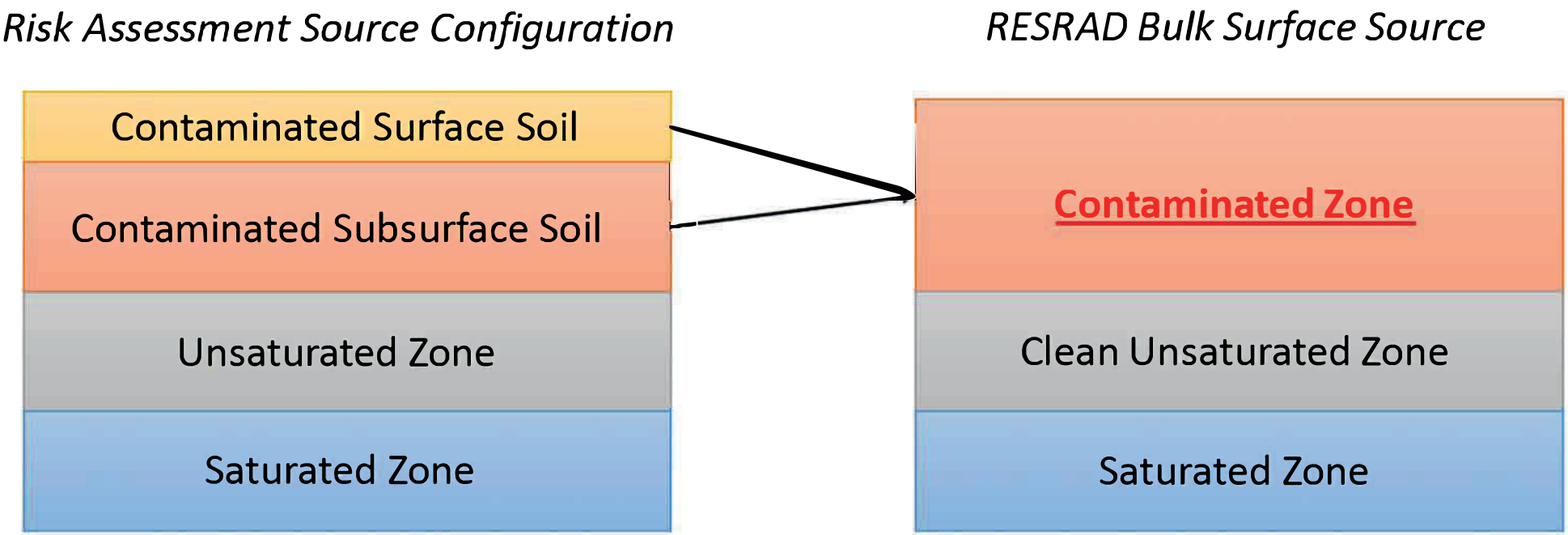
Radio-Nuclide	Water risk	Water fract.	Fish risk	Fish fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	All pathways risk	All pathways fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.175E-26	0.0000	0.000E+00	0.0000	3.373E-25	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.324E-09	0.0030	0.000E+00	0.0000	2.029E-08	0.0113
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.683E-20	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.156E-06	0.6449
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.123E-07	0.3417
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.507E-10	0.0001	0.000E+00	0.0000	1.612E-09	0.0009
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.693E-10	0.0002	0.000E+00	0.0000	1.379E-09	0.0008
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.912E-10	0.0001	0.000E+00	0.0000	6.349E-10	0.0004
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.935E-09	0.0033	0.000E+00	0.0000	1.792E-06	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

Construction Worker
RESRAD Output Files

RESRAD Model Configuration:

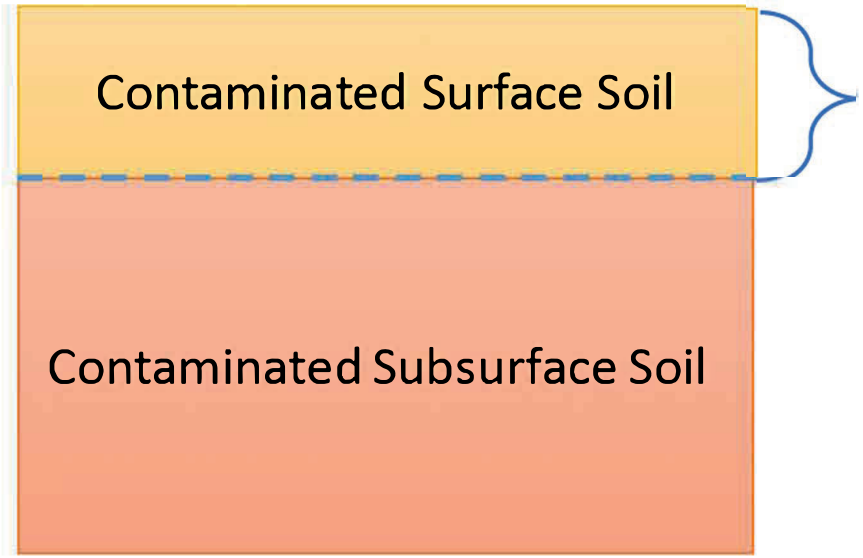
- Construction Worker



Soil Mixing Layer at Year 0:

- Construction Worker

Risk Assessment Source Configuration



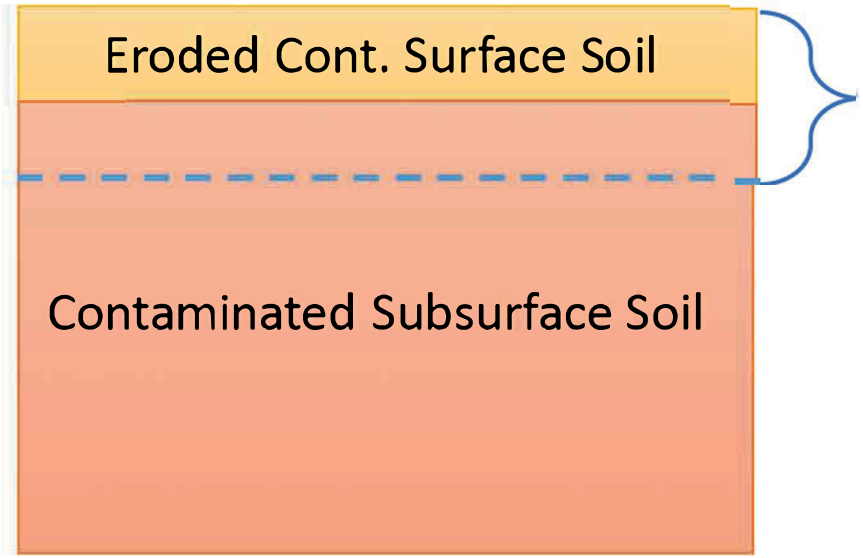
0.15m

RESRAD Bulk Surface Source

Soil Mixing Layer at Year > 0:

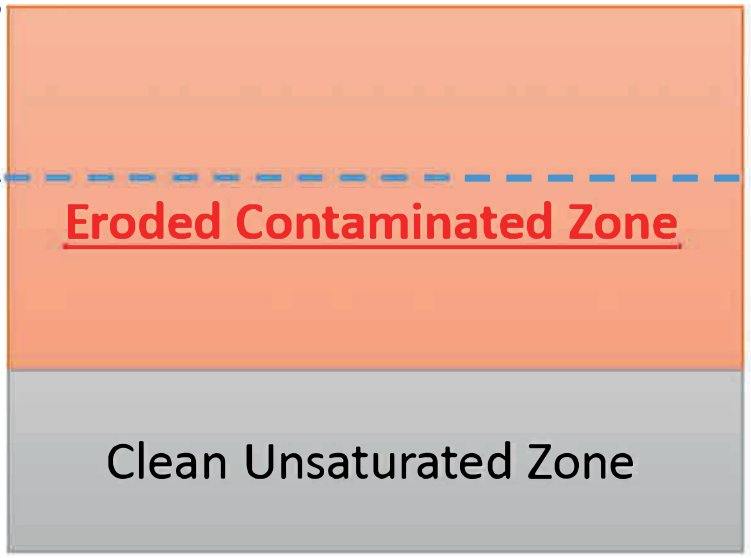
- Construction Worker

Risk Assessment Source Configuration



0.15m

RESRAD Bulk Surface Source



Weighted Total Soil EPC - Construction Worker

		Surface Soil (0-0.15 m)		Subsurface Soil (0.15 - 1.52 m)		Weighted Total Soil EPC* (0-1.52 m)		
Parameter	Units	Mean Background	Gross EPC	Mean Background	Gross EPC	Mean Background	Gross EPC	Net EPC
Radium-226	pCi/g	0.74	3.13	0.87	7.33	0.85	6.91	6.06
Radium-228	pCi/g	0.90	0.87	0.97	0.90	0.96	0.90	-0.06
Thorium-228	pCi/g	1.09	0.91	1.13	0.84	1.13	0.84	-0.28
Thorium-230	pCi/g	0.93	2.66	0.85	7.96	0.86	7.43	6.57
Thorium-232	pCi/g	0.88	0.78	0.94	0.86	0.93	0.85	-0.08
Uranium-234	pCi/g	0.91	0.89	0.68	1.24	0.71	1.20	0.50
Uranium-235	pCi/g	0.05	0.04	0.04	0.05	0.04	0.05	0.01
Uranium-238	pCi/g	0.86	0.92	0.73	1.22	0.75	1.19	0.44

*** Weighted EPC was calcuated over a 1.52 m (5') source as 0.15m (6") of the net surface soil EPC and 1.37 m (4.5') of th net subsurface soil EPC using the following formula:**

$$Weighted\ EPC = \left(0.1 \times EPC_{Surface}\right) + \left(0.9 \times EPC_{Subsurface}\right)$$

Summary : NFSS VP H Prime Construction Worker

File : C:\USERS\H5TDERJC\DESKTOP\NFSS\02 - VPH\13 - RISK ASSESSMENT\04 - RESRAD\FINAL\TOTAL SOIL CW.RAD

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Part I: Mixture Sums and Single Radionuclide Guidelines

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Summary : NFSS VP H Prime Construction Worker
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Dose Conversion Factor (and Related) Parameter Summary
Dose Library: ICRP 72 (Adult)

Menu	Parameter	Current Value#	Base Case*	Parameter Name
A-1	DCF's for external ground radiation, (mrem/yr)/(pCi/g)			
A-1	Ac-227 (Source: ICRP 60)	4.485E-04	4.485E-04	DCF1(1)
A-1	At-218 (Source: ICRP 60)	4.878E-03	4.878E-03	DCF1(2)
A-1	Bi-210 (Source: ICRP 60)	5.476E-03	5.476E-03	DCF1(3)
A-1	Bi-211 (Source: ICRP 60)	2.373E-01	2.373E-01	DCF1(4)
A-1	Bi-214 (Source: ICRP 60)	9.325E+00	9.325E+00	DCF1(5)
A-1	Fr-223 (Source: ICRP 60)	1.813E-01	1.813E-01	DCF1(6)
A-1	Pa-231 (Source: ICRP 60)	1.762E-01	1.762E-01	DCF1(7)
A-1	Pa-234 (Source: ICRP 60)	1.088E+01	1.088E+01	DCF1(8)
A-1	Pa-234m (Source: ICRP 60)	9.867E-02	9.867E-02	DCF1(9)
A-1	Pb-210 (Source: ICRP 60)	1.981E-03	1.981E-03	DCF1(10)
A-1	Pb-211 (Source: ICRP 60)	2.915E-01	2.915E-01	DCF1(11)
A-1	Pb-214 (Source: ICRP 60)	1.243E+00	1.243E+00	DCF1(12)
A-1	Po-210 (Source: ICRP 60)	4.934E-05	4.934E-05	DCF1(13)
A-1	Po-211 (Source: ICRP 60)	4.485E-02	4.485E-02	DCF1(14)
A-1	Po-214 (Source: ICRP 60)	4.840E-04	4.840E-04	DCF1(15)
A-1	Po-215 (Source: ICRP 60)	9.456E-04	9.456E-04	DCF1(16)
A-1	Po-218 (Source: ICRP 60)	5.326E-05	5.326E-05	DCF1(17)
A-1	Ra-223 (Source: ICRP 60)	5.532E-01	5.532E-01	DCF1(18)
A-1	Ra-226 (Source: ICRP 60)	2.915E-02	2.915E-02	DCF1(19)
A-1	Rn-219 (Source: ICRP 60)	2.859E-01	2.859E-01	DCF1(20)
A-1	Rn-222 (Source: ICRP 60)	2.186E-03	2.186E-03	DCF1(21)
A-1	Th-227 (Source: ICRP 60)	4.803E-01	4.803E-01	DCF1(22)
A-1	Th-230 (Source: ICRP 60)	1.071E-03	1.071E-03	DCF1(23)
A-1	Th-231 (Source: ICRP 60)	3.214E-02	3.214E-02	DCF1(24)
A-1	Th-234 (Source: ICRP 60)	2.130E-02	2.130E-02	DCF1(25)
A-1	Tl-207 (Source: ICRP 60)	2.299E-02	2.299E-02	DCF1(26)
A-1	Tl-210 (Source: ICRP 60)	1.661E+01	1.661E+01	DCF1(27)
A-1	U-234 (Source: ICRP 60)	3.439E-04	3.439E-04	DCF1(28)
A-1	U-235 (Source: ICRP 60)	6.597E-01	6.597E-01	DCF1(29)
A-1	U-238 (Source: ICRP 60)	7.961E-05	7.961E-05	DCF1(30)
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	2.104E+00	2.035E+00	DCF2(1)
B-1	Pa-231	5.180E-01	5.180E-01	DCF2(2)
B-1	Pb-210+D	3.697E-02	2.072E-02	DCF2(3)
B-1	Ra-226+D	3.526E-02	3.515E-02	DCF2(4)
B-1	Th-230	3.700E-01	3.700E-01	DCF2(5)
B-1	U-234	3.478E-02	3.478E-02	DCF2(6)
B-1	U-235+D	3.145E-02	3.145E-02	DCF2(7)
B-1	U-238	2.960E-02	2.960E-02	DCF2(8)
B-1	U-238+D	2.963E-02	2.960E-02	DCF2(9)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	4.473E-03	4.070E-03	DCF3(1)
D-1	Pa-231	2.627E-03	2.627E-03	DCF3(2)
D-1	Pb-210+D	6.998E-03	2.553E-03	DCF3(3)
D-1	Ra-226+D	1.037E-03	1.036E-03	DCF3(4)
D-1	Th-230	7.770E-04	7.770E-04	DCF3(5)
D-1	U-234	1.813E-04	1.813E-04	DCF3(6)

Summary : NFSS VP H Prime Construction Worker
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Dose Conversion Factor (and Related) Parameter Summary (continued)
Dose Library: ICRP 72 (Adult)

Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-1	U-235+D	1.752E-04	1.739E-04	DCF3(7)
D-1	U-238	1.665E-04	1.665E-04	DCF3(8)
D-1	U-238+D	1.791E-04	1.665E-04	DCF3(9)
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	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(2,1)
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(2,2)
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(2,3)
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(3,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(3,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(3,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(4,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(4,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(4,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(5,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(5,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(5,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(6,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(6,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(6,3)
D-34				
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(7,1)
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(7,2)
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(7,3)
D-34				
D-34	U-238 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(8,1)
D-34	U-238 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(8,2)
D-34	U-238 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(8,3)
D-34				
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(9,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(9,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(9,3)
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	Pa-231 , fish	1.000E+01	1.000E+01	BIOFAC(2,1)
D-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(2,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(3,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(3,2)

Summary : NFSS VP H Prime Construction Worker

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Dose Conversion Factor (and Related) Parameter Summary (continued)

Dose Library: ICRP 72 (Adult)

Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(4,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(4,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(5,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(5,2)
D-5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(6,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(6,2)
D-5				
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIOFAC(7,1)
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(7,2)
D-5				
D-5	U-238 , fish	1.000E+01	1.000E+01	BIOFAC(8,1)
D-5	U-238 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(8,2)
D-5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(9,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(9,2)

#For DCF1(xxx) only, factors are for infinite depth & area. See ETFG table in Ground Pathway of Detailed Report.

*Base Case means Default.Lib w/o Associate Nuclide contributions.

Summary : NFSS VP H Prime Construction Worker

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Site-Specific Parameter Summary

Menu	Parameter	User Input	Used by RESRAD Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.620E+04	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	1.524E+00	2.000E+00	---	THICK0
R011	Fraction of contamination that is submerged	0.000E+00	0.000E+00	---	SUBMFRACT
R011	Length parallel to aquifer flow (m)	not used	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Ac-227	1.000E+00	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g): Pa-231	1.000E+00	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Pb-210	1.000E+00	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): Ra-226	1.000E+00	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Th-230	1.000E+00	0.000E+00	---	S1(5)
R012	Initial principal radionuclide (pCi/g): U-234	1.000E+00	0.000E+00	---	S1(6)
R012	Initial principal radionuclide (pCi/g): U-235	1.000E+00	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): U-238	1.000E+00	0.000E+00	---	S1(8)
R012	Concentration in groundwater (pCi/L): Ac-227	not used	0.000E+00	---	W1(1)
R012	Concentration in groundwater (pCi/L): Pa-231	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Pb-210	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	W1(4)
R012	Concentration in groundwater (pCi/L): Th-230	not used	0.000E+00	---	W1(5)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(6)
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	---	W1(7)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(8)
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)	1.700E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	6.000E-05	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.200E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	3.600E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	6.840E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	1.040E+01	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	4.400E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	9.000E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	4.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	not used	1.000E+06	---	WAREA

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R013	Accuracy for water/soil computations	not used	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	not used	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	not used	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	not used	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	not used	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	not used	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	not used	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	not used	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	not used	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	not used	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	not used	2.500E+02	---	UW
R015	Number of unsaturated zone strata	not used	1	---	NS
R015	Unsat. zone 1, thickness (m)	not used	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	not used	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	not used	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	not used	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	not used	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	not used	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	not used	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Ac-227				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	not used	2.000E+01	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	not used	2.000E+01	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.066E-03	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for Pa-231				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.844E-03	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Pb-210				
R016	Contaminated zone (cm**3/g)	2.100E+03	1.000E+02	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	not used	1.000E+02	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	6.800E-05	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	3.800E+04	7.000E+01	---	DCNUCC(4)
R016	Unsaturated zone 1 (cm**3/g)	not used	7.000E+01	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.758E-06	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Th-230				
R016	Contaminated zone (cm**3/g)	4.500E+03	6.000E+04	---	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	not used	6.000E+04	---	DCNUCU(5,1)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.173E-05	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(6)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.844E-03	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R016	Distribution coefficients for U-235				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(7)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(7,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.844E-03	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(8)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(8,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.844E-03	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R017	Inhalation rate (m**3/yr)	2.000E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	6.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	1.000E+00	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	1.000E+00	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	2.290E-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)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	1.205E+02	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	not used	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	not used	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	not used	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	not used	-1	---	FPLANT
R018	Contamination fraction of meat	not used	-1	---	FMEAT
R018	Contamination fraction of milk	not used	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	not used	5.000E-01	---	LSI
R019	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	not used	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	not used	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	not used	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	not used	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	not used	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	not used	8.000E-02	---	TE(3)

Summary : NFSS VP H Prime Construction Worker
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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	not used	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	not used	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	not used	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
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

Summary : NFSS VP H Prime Construction Worker
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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	257	---	---	KYMAX

Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	active
2 -- inhalation (w/o radon)	active
3 -- plant ingestion	suppressed
4 -- meat ingestion	suppressed
5 -- milk ingestion	suppressed
6 -- aquatic foods	suppressed
7 -- drinking water	suppressed
8 -- soil ingestion	active
9 -- radon	suppressed
Find peak pathway doses	suppressed

Summary : NFSS VP H Prime Construction Worker

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Contaminated Zone Dimensions

Area: 16200.00 square meters

Thickness: 1.52 meters

Cover Depth: 0.00 meters

Initial Soil Concentrations, pCi/g

Ac-227	1.000E+00
Pa-231	1.000E+00
Pb-210	1.000E+00
Ra-226	1.000E+00
Th-230	1.000E+00
U-234	1.000E+00
U-235	1.000E+00
U-238	1.000E+00

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):	4.077E+00	4.069E+00	4.054E+00	4.003E+00	3.890E+00	3.636E+00	3.197E+00	2.687E+00
M(t):	1.631E-01	1.628E-01	1.621E-01	1.601E-01	1.556E-01	1.454E-01	1.279E-01	1.075E-01

Maximum TDOSE(t): 4.077E+00 mrem/yr at t = 0.000E+00 years

Summary : NFSS VP H Prime Construction Worker
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Ac-227	3.996E-01	0.0980	4.563E-01	0.1119	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.211E-01	0.0297
Pa-231	4.470E-02	0.0110	1.217E-01	0.0298	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.432E-02	0.0182
Pb-210	1.623E-03	0.0004	8.051E-03	0.0020	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.901E-01	0.0466
Ra-226	2.295E+00	0.5629	7.922E-03	0.0019	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.158E-02	0.0077
Th-230	7.334E-04	0.0002	8.183E-02	0.0201	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.145E-02	0.0053
U-234	7.614E-05	0.0000	7.682E-03	0.0019	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.996E-03	0.0012
U-235	1.514E-01	0.0371	6.947E-03	0.0017	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.827E-03	0.0012
U-238	3.374E-02	0.0083	6.543E-03	0.0016	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.935E-03	0.0012
Total	2.927E+00	0.7179	6.970E-01	0.1709	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.533E-01	0.1112

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 mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.770E-01	0.2396
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.407E-01	0.0590
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.998E-01	0.0490
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.335E+00	0.5726
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.040E-01	0.0255
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.275E-02	0.0031
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.632E-01	0.0400
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.522E-02	0.0111
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.077E+00	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Construction Worker
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 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.
Ac-227	3.843E-01	0.0944	4.389E-01	0.1079	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.164E-01	0.0286
Pa-231	5.703E-02	0.0140	1.356E-01	0.0333	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.789E-02	0.0191
Pb-210	1.573E-03	0.0004	7.804E-03	0.0019	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.843E-01	0.0453
Ra-226	2.294E+00	0.5638	8.165E-03	0.0020	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.738E-02	0.0092
Th-230	1.728E-03	0.0004	8.183E-02	0.0201	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.146E-02	0.0053
U-234	7.594E-05	0.0000	7.660E-03	0.0019	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.982E-03	0.0012
U-235	1.510E-01	0.0371	6.930E-03	0.0017	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.815E-03	0.0012
U-238	3.364E-02	0.0083	6.525E-03	0.0016	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.921E-03	0.0012
Total	2.924E+00	0.7185	6.934E-01	0.1704	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.522E-01	0.1111

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.397E-01	0.2309
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.705E-01	0.0665
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.937E-01	0.0476
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.340E+00	0.5750
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.050E-01	0.0258
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.272E-02	0.0031
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.627E-01	0.0400
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.509E-02	0.0111
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.069E+00	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Construction Worker
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 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.
Ac-227	3.556E-01	0.0877	4.061E-01	0.1002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.077E-01	0.0266
Pa-231	8.018E-02	0.0198	1.616E-01	0.0399	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.455E-02	0.0209
Pb-210	1.478E-03	0.0004	7.333E-03	0.0018	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.732E-01	0.0427
Ra-226	2.292E+00	0.5655	8.628E-03	0.0021	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.845E-02	0.0120
Th-230	3.714E-03	0.0009	8.183E-02	0.0202	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.150E-02	0.0053
U-234	7.556E-05	0.0000	7.618E-03	0.0019	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.954E-03	0.0012
U-235	1.501E-01	0.0370	6.897E-03	0.0017	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.791E-03	0.0012
U-238	3.345E-02	0.0083	6.488E-03	0.0016	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.893E-03	0.0012
Total	2.917E+00	0.7196	6.865E-01	0.1694	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.500E-01	0.1110

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.694E-01	0.2145
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.264E-01	0.0805
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.820E-01	0.0449
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.350E+00	0.5796
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.070E-01	0.0264
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.265E-02	0.0031
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.618E-01	0.0399
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.483E-02	0.0111
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.054E+00	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Construction Worker
File : C:\USERS\H5TDERJC\DESKTOP\NFSS\02 - VPH\13 - RISK ASSESSMENT\04 - RESRAD\FINAL\TOTAL SOIL CW.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	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.
Ac-227	2.708E-01	0.0676	3.093E-01	0.0773	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.204E-02	0.0205
Pa-231	1.472E-01	0.0368	2.368E-01	0.0592	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.037E-01	0.0259
Pb-210	1.189E-03	0.0003	5.896E-03	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.392E-01	0.0348
Ra-226	2.286E+00	0.5710	1.003E-02	0.0025	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.210E-02	0.0205
Th-230	1.065E-02	0.0027	8.184E-02	0.0204	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.169E-02	0.0054
U-234	7.451E-05	0.0000	7.473E-03	0.0019	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.858E-03	0.0012
U-235	1.472E-01	0.0368	6.791E-03	0.0017	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.711E-03	0.0012
U-238	3.279E-02	0.0082	6.360E-03	0.0016	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.797E-03	0.0012
Total	2.896E+00	0.7233	6.645E-01	0.1660	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.431E-01	0.1107

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.621E-01	0.1654
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.877E-01	0.1218
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.463E-01	0.0366
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.378E+00	0.5940
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.142E-01	0.0285
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.241E-02	0.0031
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.587E-01	0.0396
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.395E-02	0.0110
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.003E+00	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Construction Worker
File : C:\USERS\H5TDERJC\DESKTOP\NFSS\02 - VPH\13 - RISK ASSESSMENT\04 - RESRAD\FINAL\TOTAL SOIL CW.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	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.
Ac-227	1.244E-01	0.0320	1.421E-01	0.0365	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.768E-02	0.0097
Pa-231	2.551E-01	0.0656	3.561E-01	0.0916	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.330E-01	0.0342
Pb-210	6.375E-04	0.0002	3.162E-03	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.468E-02	0.0192
Ra-226	2.266E+00	0.5827	1.266E-02	0.0033	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.455E-01	0.0374
Th-230	3.036E-02	0.0078	8.187E-02	0.0210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.269E-02	0.0058
U-234	7.400E-05	0.0000	7.074E-03	0.0018	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.593E-03	0.0012
U-235	1.391E-01	0.0358	6.541E-03	0.0017	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.500E-03	0.0012
U-238	3.098E-02	0.0080	6.009E-03	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.532E-03	0.0012
Total	2.847E+00	0.7319	6.155E-01	0.1582	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.272E-01	0.1098

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.041E-01	0.0782
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.442E-01	0.1913
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.848E-02	0.0202
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.425E+00	0.6233
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.349E-01	0.0347
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.174E-02	0.0030
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.502E-01	0.0386
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.152E-02	0.0107
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.890E+00	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Construction Worker
File : C:\USERS\H5TDERJC\DESKTOP\NFSS\02 - VPH\13 - RISK ASSESSMENT\04 - RESRAD\FINAL\TOTAL SOIL CW.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	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.
Ac-227	8.169E-03	0.0022	9.329E-03	0.0026	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.475E-03	0.0007
Pa-231	2.914E-01	0.0802	3.858E-01	0.1061	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.339E-01	0.0368
Pb-210	7.202E-05	0.0000	3.573E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.437E-03	0.0023
Ra-226	2.199E+00	0.6047	1.502E-02	0.0041	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.059E-01	0.0566
Th-230	9.787E-02	0.0269	8.207E-02	0.0226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.829E-02	0.0078
U-234	9.800E-05	0.0000	5.843E-03	0.0016	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.777E-03	0.0010
U-235	1.144E-01	0.0315	5.889E-03	0.0016	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.875E-03	0.0011
U-238	2.539E-02	0.0070	4.925E-03	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.714E-03	0.0010
Total	2.736E+00	0.7526	5.093E-01	0.1401	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.904E-01	0.1074

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.997E-02	0.0055
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.112E-01	0.2231
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.866E-03	0.0024
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.420E+00	0.6655
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.082E-01	0.0573
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.718E-03	0.0027
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.242E-01	0.0342
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.403E-02	0.0094
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.636E+00	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Construction Worker
File : C:\USERS\H5TDERJC\DESKTOP\NFSS\02 - VPH\13 - RISK ASSESSMENT\04 - RESRAD\FINAL\TOTAL SOIL CW.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	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.
Ac-227	3.414E-06	0.0000	3.899E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.034E-06	0.0000
Pa-231	1.684E-01	0.0527	2.222E-01	0.0695	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.674E-02	0.0240
Pb-210	1.418E-07	0.0000	7.035E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.661E-05	0.0000
Ra-226	2.015E+00	0.6302	1.409E-02	0.0044	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.964E-01	0.0614
Th-230	2.787E-01	0.0872	8.267E-02	0.0259	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.565E-02	0.0143
U-234	3.276E-04	0.0001	3.419E-03	0.0011	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.189E-03	0.0007
U-235	6.549E-02	0.0205	4.274E-03	0.0013	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.518E-03	0.0008
U-238	1.437E-02	0.0045	2.791E-03	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.104E-03	0.0007
Total	2.542E+00	0.7951	3.294E-01	0.1030	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.257E-01	0.1019

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.347E-06	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.673E-01	0.1462
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.746E-05	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.225E+00	0.6960
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.071E-01	0.1273
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.936E-03	0.0019
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.229E-02	0.0226
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.927E-02	0.0060
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.197E+00	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Construction Worker
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 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.
Ac-227	5.095E-18	0.0000	5.818E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.543E-18	0.0000
Pa-231	2.265E-02	0.0084	2.990E-02	0.0111	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.033E-02	0.0038
Pb-210	4.805E-17	0.0000	2.384E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.629E-15	0.0000
Ra-226	1.484E+00	0.5523	1.038E-02	0.0039	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.447E-01	0.0539
Th-230	7.895E-01	0.2939	8.397E-02	0.0313	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.494E-02	0.0353
U-234	1.758E-03	0.0007	6.944E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.150E-04	0.0002
U-235	9.282E-03	0.0035	1.030E-03	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.980E-04	0.0002
U-238	1.964E-03	0.0007	3.822E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.881E-04	0.0001
Total	2.309E+00	0.8594	1.264E-01	0.0470	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.513E-01	0.0935

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.246E-17	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.288E-02	0.0234
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.915E-15	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.639E+00	0.6100
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.684E-01	0.3605
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.967E-03	0.0011
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.081E-02	0.0040
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.634E-03	0.0010
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.687E+00	1.0000

*Sum of all water independent and dependent pathways.

Summary : NFSS VP H Prime Construction Worker
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Dose/Source Ratios Summed Over All Pathways
Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g) 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-227+D	Ac-227+D	1.000E+00	9.770E-01	9.397E-01	8.694E-01	6.621E-01	3.041E-01	1.997E-02	8.347E-06	1.246E-17
Pa-231	Pa-231	1.000E+00	2.251E-01	2.244E-01	2.232E-01	2.187E-01	2.066E-01	1.690E-01	9.529E-02	1.282E-02
Pa-231	Ac-227+D	1.000E+00	1.564E-02	4.605E-02	1.032E-01	2.690E-01	5.377E-01	6.422E-01	3.720E-01	5.005E-02
Pa-231	äDSR(j)		2.407E-01	2.705E-01	3.264E-01	4.877E-01	7.442E-01	8.112E-01	4.673E-01	6.288E-02
Pb-210+D	Pb-210+D	1.000E+00	1.998E-01	1.937E-01	1.820E-01	1.463E-01	7.848E-02	8.866E-03	1.746E-05	5.915E-15
Ra-226+D	Ra-226+D	1.000E+00	2.332E+00	2.331E+00	2.329E+00	2.322E+00	2.301E+00	2.232E+00	2.045E+00	1.506E+00
Ra-226+D	Pb-210+D	1.000E+00	3.121E-03	9.233E-03	2.089E-02	5.635E-02	1.232E-01	1.876E-01	1.801E-01	1.326E-01
Ra-226+D	äDSR(j)		2.335E+00	2.340E+00	2.350E+00	2.378E+00	2.425E+00	2.420E+00	2.225E+00	1.639E+00
Th-230	Th-230	1.000E+00	1.035E-01	1.035E-01	1.035E-01	1.035E-01	1.034E-01	1.031E-01	1.022E-01	9.937E-02
Th-230	Ra-226+D	1.000E+00	5.051E-04	1.515E-03	3.533E-03	1.058E-02	3.059E-02	9.914E-02	2.827E-01	8.012E-01
Th-230	Pb-210+D	1.000E+00	4.518E-07	3.135E-06	1.624E-05	1.353E-04	9.435E-04	6.007E-03	2.207E-02	6.781E-02
Th-230	äDSR(j)		1.040E-01	1.050E-01	1.070E-01	1.142E-01	1.349E-01	2.082E-01	4.071E-01	9.684E-01
U-234	U-234	1.000E+00	1.275E-02	1.272E-02	1.264E-02	1.240E-02	1.171E-02	9.593E-03	5.428E-03	7.399E-04
U-234	Th-230	1.000E+00	4.654E-07	1.395E-06	3.245E-06	9.637E-06	2.720E-05	8.126E-05	1.869E-04	2.995E-04
U-234	Ra-226+D	1.000E+00	1.515E-09	1.059E-08	5.587E-08	4.959E-07	4.091E-06	4.117E-05	2.993E-04	1.779E-03
U-234	Pb-210+D	1.000E+00	1.018E-12	1.516E-11	1.740E-10	4.352E-09	9.081E-08	2.024E-06	2.158E-05	1.485E-04
U-234	äDSR(j)		1.275E-02	1.272E-02	1.265E-02	1.241E-02	1.174E-02	9.718E-03	5.936E-03	2.967E-03
U-235+D	U-235+D	1.000E+00	1.632E-01	1.627E-01	1.618E-01	1.586E-01	1.498E-01	1.228E-01	6.952E-02	9.495E-03
U-235+D	Pa-231	1.000E+00	2.380E-06	7.122E-06	1.653E-05	4.860E-05	1.333E-04	3.598E-04	6.078E-04	2.743E-04
U-235+D	Ac-227+D	1.000E+00	1.106E-07	7.644E-07	3.927E-06	3.178E-05	2.047E-04	1.027E-03	2.153E-03	1.041E-03
U-235+D	äDSR(j)		1.632E-01	1.627E-01	1.618E-01	1.587E-01	1.502E-01	1.242E-01	7.229E-02	1.081E-02
U-238	U-238	5.400E-05	6.017E-07	6.000E-07	5.966E-07	5.849E-07	5.525E-07	4.528E-07	2.564E-07	3.501E-08
U-238+D	U-238+D	9.999E-01	4.522E-02	4.509E-02	4.483E-02	4.395E-02	4.152E-02	3.402E-02	1.926E-02	2.631E-03
U-238+D	U-234	9.999E-01	1.807E-08	5.407E-08	1.254E-07	3.689E-07	1.012E-06	2.734E-06	4.626E-06	2.101E-06
U-238+D	Th-230	9.999E-01	4.396E-13	3.072E-12	1.618E-11	1.428E-10	1.159E-09	1.103E-08	6.855E-08	2.482E-07
U-238+D	Ra-226+D	9.999E-01	1.073E-15	1.607E-14	1.870E-13	4.906E-12	1.164E-10	3.742E-09	7.450E-08	1.089E-06
U-238+D	Pb-210+D	9.999E-01	5.776E-19	1.779E-17	4.419E-16	3.284E-14	2.024E-12	1.549E-10	4.957E-09	8.919E-08
U-238+D	äDSR(j)		4.522E-02	4.509E-02	4.483E-02	4.395E-02	4.152E-02	3.403E-02	1.927E-02	2.634E-03

The DSR includes contributions from associated (half-life ó 180 days) daughters.

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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
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Ac-227 2.559E+01 2.660E+01 2.876E+01 3.776E+01 8.220E+01 1.252E+03 2.995E+06 *7.232E+13
Pa-231 1.039E+02 9.242E+01 7.660E+01 5.126E+01 3.359E+01 3.082E+01 5.350E+01 3.976E+02
Pb-210 1.251E+02 1.291E+02 1.374E+02 1.709E+02 3.186E+02 2.820E+03 1.432E+06 *7.634E+13
Ra-226 1.071E+01 1.068E+01 1.064E+01 1.051E+01 1.031E+01 1.033E+01 1.123E+01 1.525E+01
Th-230 2.404E+02 2.380E+02 2.336E+02 2.189E+02 1.853E+02 1.201E+02 6.141E+01 2.582E+01
U-234 1.960E+03 1.966E+03 1.977E+03 2.015E+03 2.129E+03 2.573E+03 4.211E+03 8.425E+03
U-235 1.532E+02 1.536E+02 1.545E+02 1.575E+02 1.665E+02 2.013E+02 3.459E+02 2.313E+03
U-238 5.529E+02 5.544E+02 5.576E+02 5.688E+02 6.021E+02 7.347E+02 1.297E+03 9.490E+03
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*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) (pCi/g)	G(i,tmin) (pCi/g)	DSR(i,tmax) (pCi/g)	G(i,tmax) (pCi/g)
Ac-227	1.000E+00	0.000E+00	9.770E-01	2.559E+01	9.770E-01	2.559E+01
Pa-231	1.000E+00	65.6 ñ 0.1	8.474E-01	2.950E+01	2.407E-01	1.039E+02
Pb-210	1.000E+00	0.000E+00	1.998E-01	1.251E+02	1.998E-01	1.251E+02
Ra-226	1.000E+00	56.6 ñ 0.1	2.440E+00	1.024E+01	2.335E+00	1.071E+01
Th-230	1.000E+00	1.000E+03	9.684E-01	2.582E+01	1.040E-01	2.404E+02
U-234	1.000E+00	0.000E+00	1.275E-02	1.960E+03	1.275E-02	1.960E+03
U-235	1.000E+00	0.000E+00	1.632E-01	1.532E+02	1.632E-01	1.532E+02
U-238	1.000E+00	0.000E+00	4.522E-02	5.529E+02	4.522E-02	5.529E+02

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Individual Nuclide Dose Summed Over All Pathways
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	DOSE(j,t), mrem/yr t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-227	Ac-227	1.000E+00	9.770E-01	9.397E-01	8.694E-01	6.621E-01	3.041E-01	1.997E-02	8.347E-06	1.246E-17
Ac-227	Pa-231	1.000E+00	1.564E-02	4.605E-02	1.032E-01	2.690E-01	5.377E-01	6.422E-01	3.720E-01	5.005E-02
Ac-227	U-235	1.000E+00	1.106E-07	7.644E-07	3.927E-06	3.178E-05	2.047E-04	1.027E-03	2.153E-03	1.041E-03
Ac-227	äDOSE(j)		9.926E-01	9.858E-01	9.726E-01	9.311E-01	8.420E-01	6.632E-01	3.741E-01	5.110E-02
Pa-231	Pa-231	1.000E+00	2.251E-01	2.244E-01	2.232E-01	2.187E-01	2.066E-01	1.690E-01	9.529E-02	1.282E-02
Pa-231	U-235	1.000E+00	2.380E-06	7.122E-06	1.653E-05	4.860E-05	1.333E-04	3.598E-04	6.078E-04	2.743E-04
Pa-231	äDOSE(j)		2.251E-01	2.245E-01	2.232E-01	2.188E-01	2.067E-01	1.694E-01	9.590E-02	1.310E-02
Pb-210	Pb-210	1.000E+00	1.998E-01	1.937E-01	1.820E-01	1.463E-01	7.848E-02	8.866E-03	1.746E-05	5.915E-15
Pb-210	Ra-226	1.000E+00	3.121E-03	9.233E-03	2.089E-02	5.635E-02	1.232E-01	1.876E-01	1.801E-01	1.326E-01
Pb-210	Th-230	1.000E+00	4.518E-07	3.135E-06	1.624E-05	1.353E-04	9.435E-04	6.007E-03	2.207E-02	6.781E-02
Pb-210	U-234	1.000E+00	1.018E-12	1.516E-11	1.740E-10	4.352E-09	9.081E-08	2.024E-06	2.158E-05	1.485E-04
Pb-210	U-238	9.999E-01	5.776E-19	1.779E-17	4.419E-16	3.284E-14	2.024E-12	1.549E-10	4.957E-09	8.919E-08
Pb-210	äDOSE(j)		2.029E-01	2.029E-01	2.029E-01	2.028E-01	2.026E-01	2.024E-01	2.022E-01	2.006E-01
Ra-226	Ra-226	1.000E+00	2.332E+00	2.331E+00	2.329E+00	2.322E+00	2.301E+00	2.232E+00	2.045E+00	1.506E+00
Ra-226	Th-230	1.000E+00	5.051E-04	1.515E-03	3.533E-03	1.058E-02	3.059E-02	9.914E-02	2.827E-01	8.012E-01
Ra-226	U-234	1.000E+00	1.515E-09	1.059E-08	5.587E-08	4.959E-07	4.091E-06	4.117E-05	2.993E-04	1.779E-03
Ra-226	U-238	9.999E-01	1.073E-15	1.607E-14	1.870E-13	4.906E-12	1.164E-10	3.742E-09	7.450E-08	1.089E-06
Ra-226	äDOSE(j)		2.332E+00	2.332E+00	2.332E+00	2.332E+00	2.332E+00	2.331E+00	2.328E+00	2.309E+00
Th-230	Th-230	1.000E+00	1.035E-01	1.035E-01	1.035E-01	1.035E-01	1.034E-01	1.031E-01	1.022E-01	9.937E-02
Th-230	U-234	1.000E+00	4.654E-07	1.395E-06	3.245E-06	9.637E-06	2.720E-05	8.126E-05	1.869E-04	2.995E-04
Th-230	U-238	9.999E-01	4.396E-13	3.072E-12	1.618E-11	1.428E-10	1.159E-09	1.103E-08	6.855E-08	2.482E-07
Th-230	äDOSE(j)		1.035E-01	1.035E-01	1.035E-01	1.035E-01	1.034E-01	1.032E-01	1.024E-01	9.967E-02
U-234	U-234	1.000E+00	1.275E-02	1.272E-02	1.264E-02	1.240E-02	1.171E-02	9.593E-03	5.428E-03	7.399E-04
U-234	U-238	9.999E-01	1.807E-08	5.407E-08	1.254E-07	3.689E-07	1.012E-06	2.734E-06	4.626E-06	2.101E-06
U-234	äDOSE(j)		1.275E-02	1.272E-02	1.264E-02	1.240E-02	1.171E-02	9.596E-03	5.433E-03	7.420E-04
U-235	U-235	1.000E+00	1.632E-01	1.627E-01	1.618E-01	1.586E-01	1.498E-01	1.228E-01	6.952E-02	9.495E-03
U-238	U-238	5.400E-05	6.017E-07	6.000E-07	5.966E-07	5.849E-07	5.525E-07	4.528E-07	2.564E-07	3.501E-08
U-238	U-238	9.999E-01	4.522E-02	4.509E-02	4.483E-02	4.395E-02	4.152E-02	3.402E-02	1.926E-02	2.631E-03
U-238	äDOSE(j)		4.522E-02	4.509E-02	4.483E-02	4.395E-02	4.152E-02	3.402E-02	1.926E-02	2.631E-03

THF(i) is the thread fraction of the parent nuclide.

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Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-227	Ac-227	1.000E+00	1.000E+00	9.618E-01	8.898E-01	6.777E-01	3.113E-01	2.044E-02	8.544E-06	1.275E-17
Ac-227	Pa-231	1.000E+00	0.000E+00	3.118E-02	8.975E-02	2.598E-01	5.357E-01	6.453E-01	3.740E-01	5.032E-02
Ac-227	U-235	1.000E+00	0.000E+00	3.318E-07	2.900E-06	2.913E-05	2.001E-04	1.026E-03	2.161E-03	1.046E-03
Ac-227	äS(j):		1.000E+00	9.930E-01	9.796E-01	9.375E-01	8.472E-01	6.667E-01	3.761E-01	5.137E-02
Pa-231	Pa-231	1.000E+00	1.000E+00	9.971E-01	9.914E-01	9.718E-01	9.176E-01	7.509E-01	4.233E-01	5.696E-02
Pa-231	U-235	1.000E+00	0.000E+00	2.110E-05	6.293E-05	2.056E-04	5.827E-04	1.590E-03	2.696E-03	1.218E-03
Pa-231	äS(j):		1.000E+00	9.972E-01	9.915E-01	9.720E-01	9.182E-01	7.524E-01	4.260E-01	5.818E-02
Pb-210	Pb-210	1.000E+00	1.000E+00	9.693E-01	9.108E-01	7.323E-01	3.928E-01	4.437E-02	8.738E-05	2.960E-14
Pb-210	Ra-226	1.000E+00	0.000E+00	3.060E-02	8.896E-02	2.665E-01	6.013E-01	9.238E-01	8.876E-01	6.537E-01
Pb-210	Th-230	1.000E+00	0.000E+00	6.662E-06	5.872E-05	6.075E-04	4.519E-03	2.940E-02	1.086E-01	3.340E-01
Pb-210	U-234	1.000E+00	0.000E+00	2.003E-11	5.316E-10	1.857E-08	4.274E-07	9.853E-06	1.060E-04	7.312E-04
Pb-210	U-238	9.999E-01	0.000E+00	1.421E-17	1.134E-15	1.330E-13	9.365E-12	7.503E-10	2.431E-08	4.391E-07
Pb-210	äS(j):		1.000E+00	9.999E-01	9.998E-01	9.994E-01	9.986E-01	9.976E-01	9.964E-01	9.885E-01
Ra-226	Ra-226	1.000E+00	1.000E+00	9.996E-01	9.987E-01	9.956E-01	9.870E-01	9.572E-01	8.771E-01	6.460E-01
Ra-226	Th-230	1.000E+00	0.000E+00	4.331E-04	1.299E-03	4.322E-03	1.290E-02	4.230E-02	1.210E-01	3.434E-01
Ra-226	U-234	1.000E+00	0.000E+00	1.948E-09	1.749E-08	1.928E-07	1.698E-06	1.749E-05	1.280E-04	7.625E-04
Ra-226	U-238	9.999E-01	0.000E+00	1.840E-15	4.952E-14	1.814E-12	4.751E-11	1.582E-09	3.181E-08	4.666E-07
Ra-226	äS(j):		1.000E+00	1.000E+00	1.000E+00	1.000E+00	9.999E-01	9.996E-01	9.983E-01	9.902E-01
Th-230	Th-230	1.000E+00	1.000E+00	1.000E+00	9.999E-01	9.996E-01	9.988E-01	9.959E-01	9.879E-01	9.601E-01
Th-230	U-234	1.000E+00	0.000E+00	8.989E-06	2.689E-05	8.873E-05	2.587E-04	7.817E-04	1.803E-03	2.894E-03
Th-230	U-238	9.999E-01	0.000E+00	1.273E-11	1.142E-10	1.252E-09	1.085E-08	1.056E-07	6.607E-07	2.397E-06
Th-230	äS(j):		1.000E+00	1.000E+00	9.999E-01	9.997E-01	9.990E-01	9.967E-01	9.897E-01	9.630E-01
U-234	U-234	1.000E+00	1.000E+00	9.972E-01	9.915E-01	9.719E-01	9.181E-01	7.522E-01	4.257E-01	5.802E-02
U-234	U-238	9.999E-01	0.000E+00	2.827E-06	8.432E-06	2.755E-05	7.809E-05	2.133E-04	3.622E-04	1.647E-04
U-234	äS(j):		1.000E+00	9.972E-01	9.915E-01	9.720E-01	9.182E-01	7.524E-01	4.260E-01	5.818E-02
U-235	U-235	1.000E+00	1.000E+00	9.972E-01	9.915E-01	9.720E-01	9.182E-01	7.524E-01	4.260E-01	5.818E-02
U-238	U-238	5.400E-05	5.400E-05	5.385E-05	5.354E-05	5.249E-05	4.958E-05	4.063E-05	2.301E-05	3.142E-06
U-238	U-238	9.999E-01	9.999E-01	9.971E-01	9.915E-01	9.719E-01	9.182E-01	7.524E-01	4.260E-01	5.818E-02
U-238	äS(j):		1.000E+00	9.972E-01	9.915E-01	9.720E-01	9.182E-01	7.524E-01	4.260E-01	5.818E-02

THF(i) is the thread fraction of the parent nuclide.

RESCALC.EXE execution time = 1.38 seconds

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Part III: Intake Quantities and Health Risk Factors

Intrisk : NFSS VP H Prime Construction Worker
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Cancer Risk Slope Factors Summary Table
Risk Library: FGR 13 Morbidity

Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-1	Ground external radiation slope factors, 1/yr per (pCi/g):			
Sf-1	Ac-227+D	1.47E-06	3.48E-10	SLPF(1,1)
Sf-1	Pa-231	1.39E-07	1.39E-07	SLPF(2,1)
Sf-1	Pb-210+D	4.21E-09	1.41E-09	SLPF(3,1)
Sf-1	Ra-226+D	8.49E-06	2.29E-08	SLPF(4,1)
Sf-1	Th-230	8.19E-10	8.19E-10	SLPF(5,1)
Sf-1	U-234	2.52E-10	2.52E-10	SLPF(6,1)
Sf-1	U-235+D	5.43E-07	5.18E-07	SLPF(7,1)
Sf-1	U-238	4.99E-11	4.99E-11	SLPF(8,1)
Sf-1	U-238+D	1.14E-07	4.99E-11	SLPF(9,1)
Sf-2	Inhalation, slope factors, 1/(pCi):			
Sf-2	Ac-227+D	2.13E-07	1.49E-07	SLPF(1,2)
Sf-2	Pa-231	7.62E-08	7.62E-08	SLPF(2,2)
Sf-2	Pb-210+D	3.08E-08	1.58E-08	SLPF(3,2)
Sf-2	Ra-226+D	2.83E-08	2.82E-08	SLPF(4,2)
Sf-2	Th-230	3.40E-08	3.40E-08	SLPF(5,2)
Sf-2	U-234	2.78E-08	2.78E-08	SLPF(6,2)
Sf-2	U-235+D	2.50E-08	2.50E-08	SLPF(7,2)
Sf-2	U-238	2.36E-08	2.36E-08	SLPF(8,2)
Sf-2	U-238+D	2.36E-08	2.36E-08	SLPF(9,2)
Sf-3	Food ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.53E-10	2.45E-10	SLPF(1,3)
Sf-3	Pa-231	2.26E-10	2.26E-10	SLPF(2,3)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF(3,3)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF(4,3)
Sf-3	Th-230	1.19E-10	1.19E-10	SLPF(5,3)
Sf-3	U-234	9.55E-11	9.55E-11	SLPF(6,3)
Sf-3	U-235+D	9.76E-11	9.44E-11	SLPF(7,3)
Sf-3	U-238	8.66E-11	8.66E-11	SLPF(8,3)
Sf-3	U-238+D	1.21E-10	8.66E-11	SLPF(9,3)
Sf-3	Water ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	4.86E-10	2.01E-10	SLPF(1,4)
Sf-3	Pa-231	1.73E-10	1.73E-10	SLPF(2,4)
Sf-3	Pb-210+D	2.66E-09	8.81E-10	SLPF(3,4)
Sf-3	Ra-226+D	3.86E-10	3.85E-10	SLPF(4,4)
Sf-3	Th-230	9.10E-11	9.10E-11	SLPF(5,4)
Sf-3	U-234	7.07E-11	7.07E-11	SLPF(6,4)
Sf-3	U-235+D	7.18E-11	6.96E-11	SLPF(7,4)
Sf-3	U-238	6.40E-11	6.40E-11	SLPF(8,4)
Sf-3	U-238+D	8.71E-11	6.40E-11	SLPF(9,4)
Sf-3	Soil ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.53E-10	2.45E-10	SLPF(1,5)
Sf-3	Pa-231	2.26E-10	2.26E-10	SLPF(2,5)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF(3,5)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF(4,5)
Sf-3	Th-230	1.19E-10	1.19E-10	SLPF(5,5)

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Cancer Risk Slope Factors Summary Table (continued)
Risk Library: FGR 13 Morbidity

Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-3	U-234	9.55E-11	9.55E-11	SLPF(6,5)
Sf-3	U-235+D	9.76E-11	9.44E-11	SLPF(7,5)
Sf-3	U-238	8.66E-11	8.66E-11	SLPF(8,5)
Sf-3	U-238+D	1.21E-10	8.66E-11	SLPF(9,5)
Sf-Rn	Radon Inhalation slope factors, 1/(pCi):			
Sf-Rn	Rn-222	1.80E-12	1.80E-12	SLPFRN(1,1)
Sf-Rn	Po-218	3.70E-12	3.70E-12	SLPFRN(1,2)
Sf-Rn	Pb-214	6.20E-12	6.20E-12	SLPFRN(1,3)
Sf-Rn	Bi-214	1.50E-11	1.50E-11	SLPFRN(1,4)
Sf-Rn	Radon K factors, (mrem/WLM):			
Sf-Rn	Rn-222 Indoor	3.88E+02	3.88E+02	KFACTR(1,1)
Sf-Rn	Rn-222 Outdoor	3.88E+02	3.88E+02	KFACTR(1,2)

*Base Case means Default.Lib w/o Associate Nuclide contributions.

Intrisk : NFSS VP H Prime Construction Worker

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Risk Slope and Environmental Transport Factors for the Ground Pathway

Nuclide	Slope(i)*	ETFG(i,t) At Time in Years (dimensionless)							
(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
Ac-227	3.480E-10	2.202E-01	2.202E-01	2.202E-01	2.202E-01	2.202E-01	2.202E-01	2.202E-01
At-218	3.570E-09	2.230E-01	2.230E-01	2.230E-01	2.230E-01	2.230E-01	2.230E-01	2.230E-01
Bi-210	2.760E-09	2.176E-01	2.176E-01	2.176E-01	2.176E-01	2.176E-01	2.176E-01	2.176E-01
Bi-211	1.880E-07	2.177E-01	2.177E-01	2.177E-01	2.177E-01	2.177E-01	2.177E-01	2.177E-01
Bi-214	7.480E-06	2.164E-01	2.164E-01	2.164E-01	2.164E-01	2.164E-01	2.164E-01	2.164E-01
Fr-223	1.400E-07	2.187E-01	2.187E-01	2.187E-01	2.187E-01	2.187E-01	2.187E-01	2.187E-01
Pa-231	1.390E-07	2.177E-01	2.177E-01	2.177E-01	2.177E-01	2.177E-01	2.177E-01	2.177E-01
Pa-234	8.710E-06	2.164E-01	2.164E-01	2.164E-01	2.164E-01	2.164E-01	2.164E-01	2.164E-01
Pa-234m	6.870E-08	2.163E-01	2.163E-01	2.163E-01	2.163E-01	2.163E-01	2.163E-01	2.163E-01
Pb-210	1.410E-09	2.253E-01	2.253E-01	2.253E-01	2.253E-01	2.253E-01	2.253E-01	2.253E-01
Pb-211	2.290E-07	2.164E-01	2.164E-01	2.164E-01	2.164E-01	2.164E-01	2.164E-01	2.164E-01
Pb-214	9.820E-07	2.175E-01	2.175E-01	2.175E-01	2.175E-01	2.175E-01	2.175E-01	2.175E-01
Po-210	3.950E-11	2.162E-01	2.162E-01	2.162E-01	2.162E-01	2.162E-01	2.162E-01	2.162E-01
Po-211	3.580E-08	2.156E-01	2.156E-01	2.156E-01	2.156E-01	2.156E-01	2.156E-01	2.156E-01
Po-214	3.860E-10	2.156E-01	2.156E-01	2.156E-01	2.156E-01	2.156E-01	2.156E-01	2.156E-01
Po-215	7.480E-10	2.167E-01	2.167E-01	2.167E-01	2.167E-01	2.167E-01	2.167E-01	2.167E-01
Po-218	4.260E-11	2.162E-01	2.162E-01	2.162E-01	2.162E-01	2.162E-01	2.162E-01	2.162E-01
Ra-223	4.340E-07	2.186E-01	2.186E-01	2.186E-01	2.186E-01	2.186E-01	2.186E-01	2.186E-01
Ra-226	2.290E-08	2.192E-01	2.192E-01	2.192E-01	2.192E-01	2.192E-01	2.192E-01	2.192E-01
Rn-219	2.250E-07	2.176E-01	2.176E-01	2.176E-01	2.176E-01	2.176E-01	2.176E-01	2.176E-01
Rn-222	1.740E-09	2.159E-01	2.159E-01	2.159E-01	2.159E-01	2.159E-01	2.159E-01	2.159E-01
Th-227	3.780E-07	2.189E-01	2.189E-01	2.189E-01	2.189E-01	2.189E-01	2.189E-01	2.189E-01
Th-230	8.190E-10	2.206E-01	2.206E-01	2.206E-01	2.206E-01	2.206E-01	2.206E-01	2.206E-01
Th-231	2.450E-08	2.208E-01	2.208E-01	2.208E-01	2.208E-01	2.208E-01	2.208E-01	2.208E-01
Th-234	1.630E-08	2.211E-01	2.211E-01	2.211E-01	2.211E-01	2.211E-01	2.211E-01	2.211E-01
Tl-207	1.520E-08	2.165E-01	2.165E-01	2.165E-01	2.165E-01	2.165E-01	2.165E-01	2.165E-01
Tl-210	0.000E+00	2.290E-01	2.290E-01	2.290E-01	2.290E-01	2.290E-01	2.290E-01	2.290E-01
U-234	2.520E-10	2.217E-01	2.217E-01	2.217E-01	2.217E-01	2.217E-01	2.217E-01	2.217E-01
U-235	5.180E-07	2.191E-01	2.191E-01	2.191E-01	2.191E-01	2.191E-01	2.191E-01	2.191E-01
U-238	4.990E-11	2.272E-01	2.272E-01	2.272E-01	2.272E-01	2.272E-01	2.272E-01	2.272E-01

* - Units are 1/yr per (pCi/g) at infinite depth and area. Multiplication by ETFG(i,t) converts to site conditions.

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 0.000E+00 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	2.212E-01	0.000E+00	0.000E+00	0.000E+00	2.759E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.759E+01
Pa-231	2.212E-01	0.000E+00	0.000E+00	0.000E+00	2.759E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.759E+01
Pb-210	2.212E-01	0.000E+00	0.000E+00	0.000E+00	2.759E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.759E+01
Ra-226	2.212E-01	0.000E+00	0.000E+00	0.000E+00	2.759E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.759E+01
Th-230	2.212E-01	0.000E+00	0.000E+00	0.000E+00	2.759E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.759E+01
U-234	2.212E-01	0.000E+00	0.000E+00	0.000E+00	2.759E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.759E+01
U-235	2.212E-01	0.000E+00	0.000E+00	0.000E+00	2.759E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.759E+01
U-238	2.212E-01	0.000E+00	0.000E+00	0.000E+00	2.759E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.759E+01

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 0.000E+00 years

Radon	Radionuclides							
Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	3.188E-07	0.1237	4.691E-08	0.0182	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.796E-08	0.0070
Pa-231	3.022E-08	0.0117	1.683E-08	0.0065	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.227E-09	0.0024
Pb-210	9.267E-10	0.0004	6.802E-09	0.0026	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.500E-08	0.0369
Ra-226	1.838E-06	0.7129	6.253E-09	0.0024	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.420E-08	0.0055
Th-230	1.806E-10	0.0001	7.519E-09	0.0029	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.284E-09	0.0013
U-234	5.579E-11	0.0000	6.140E-09	0.0024	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.632E-09	0.0010
U-235	1.187E-07	0.0461	5.522E-09	0.0021	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.690E-09	0.0010
U-238	2.462E-08	0.0096	5.219E-09	0.0020	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.323E-09	0.0013
Total	2.331E-06	0.9044	1.012E-07	0.0393	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.453E-07	0.0564

Intrisk : NFSS VP H Prime Construction Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

Water Dependent Pathways

	Water		Fish		Plant		Meat		Milk		All Pathways**	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.836E-07	0.1488
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.328E-08	0.0207
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.027E-07	0.0399
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.858E-06	0.7208
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.098E-08	0.0043
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.827E-09	0.0034
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.269E-07	0.0493
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.317E-08	0.0129
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.578E-06	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 0.000E+00 years

Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

Intrisk : NFSS VP H Prime Construction Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground risk	Ground fract.	Inhalation risk	Inhalation fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	Soil risk	Soil fract.
Ac-227	3.137E-07	0.1217	4.617E-08	0.0179	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.767E-08	0.0069
Pa-231	3.524E-08	0.0137	1.757E-08	0.0068	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.510E-09	0.0025
Pb-210	9.124E-10	0.0004	6.697E-09	0.0026	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.354E-08	0.0363
Ra-226	1.837E-06	0.7128	6.356E-09	0.0025	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.566E-08	0.0061
Th-230	5.786E-10	0.0002	7.521E-09	0.0029	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.287E-09	0.0013
U-234	5.580E-11	0.0000	6.140E-09	0.0024	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.632E-09	0.0010
U-235	1.187E-07	0.0461	5.522E-09	0.0021	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.691E-09	0.0010
U-238	2.462E-08	0.0096	5.219E-09	0.0020	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.323E-09	0.0013
Total	2.331E-06	0.9044	1.012E-07	0.0393	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.453E-07	0.0564

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

Water Dependent Pathways

Radio-Nuclide	Water risk	Water fract.	Fish risk	Fish fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	All pathways risk	All pathways fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.776E-07	0.1465
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.932E-08	0.0230
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.012E-07	0.0392
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.859E-06	0.7213
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.139E-08	0.0044
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.827E-09	0.0034
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.269E-07	0.0493
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.317E-08	0.0129
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.578E-06	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.000E+00 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	2.196E-01	0.000E+00	0.000E+00	0.000E+00	2.740E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.740E+01
Pa-231	2.205E-01	0.000E+00	0.000E+00	0.000E+00	2.752E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.752E+01
Pb-210	2.212E-01	0.000E+00	0.000E+00	0.000E+00	2.759E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.759E+01
Ra-226	2.212E-01	0.000E+00	0.000E+00	0.000E+00	2.759E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.759E+01
Th-230	2.212E-01	0.000E+00	0.000E+00	0.000E+00	2.759E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.759E+01
U-234	2.205E-01	0.000E+00	0.000E+00	0.000E+00	2.752E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.752E+01
U-235	2.205E-01	0.000E+00	0.000E+00	0.000E+00	2.752E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.752E+01
U-238	2.205E-01	0.000E+00	0.000E+00	0.000E+00	2.752E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.752E+01

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.000E+00 years

Radon	Radionuclides							
Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	3.166E-07	0.1230	4.659E-08	0.0181	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.783E-08	0.0069
Pa-231	3.013E-08	0.0117	1.678E-08	0.0065	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.210E-09	0.0024
Pb-210	9.266E-10	0.0004	6.801E-09	0.0026	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.500E-08	0.0369
Ra-226	1.838E-06	0.7138	6.253E-09	0.0024	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.420E-08	0.0055
Th-230	1.806E-10	0.0001	7.519E-09	0.0029	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.284E-09	0.0013
U-234	5.564E-11	0.0000	6.122E-09	0.0024	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.624E-09	0.0010
U-235	1.184E-07	0.0460	5.506E-09	0.0021	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.683E-09	0.0010
U-238	2.455E-08	0.0095	5.204E-09	0.0020	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.314E-09	0.0013
Total	2.328E-06	0.9045	1.008E-07	0.0391	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.451E-07	0.0564

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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.810E-07	0.1480
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.312E-08	0.0206
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.027E-07	0.0399
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.858E-06	0.7218
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.098E-08	0.0043
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.802E-09	0.0034
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.266E-07	0.0492
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.307E-08	0.0128
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.574E-06	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+00 years

Radionuclides

Radon							
Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	3.018E-07	0.1172	4.441E-08	0.0173	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.700E-08	0.0066
Pa-231	4.492E-08	0.0175	1.896E-08	0.0074	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.043E-09	0.0027
Pb-210	8.844E-10	0.0003	6.492E-09	0.0025	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.067E-08	0.0352
Ra-226	1.836E-06	0.7134	6.558E-09	0.0025	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.852E-08	0.0072
Th-230	1.374E-09	0.0005	7.523E-09	0.0029	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.294E-09	0.0013
U-234	5.565E-11	0.0000	6.122E-09	0.0024	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.624E-09	0.0010
U-235	1.184E-07	0.0460	5.506E-09	0.0021	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.683E-09	0.0010
U-238	2.455E-08	0.0095	5.204E-09	0.0020	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.314E-09	0.0013
Total	2.328E-06	0.9045	1.008E-07	0.0391	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.451E-07	0.0564

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.632E-07	0.1411
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.092E-08	0.0275
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.805E-08	0.0381
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.861E-06	0.7231
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.219E-08	0.0047
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.802E-09	0.0034
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.266E-07	0.0492
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.307E-08	0.0128
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.574E-06	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 3.000E+00 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	2.167E-01	0.000E+00	0.000E+00	0.000E+00	2.703E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.703E+01
Pa-231	2.193E-01	0.000E+00	0.000E+00	0.000E+00	2.736E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.736E+01
Pb-210	2.211E-01	0.000E+00	0.000E+00	0.000E+00	2.759E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.759E+01
Ra-226	2.212E-01	0.000E+00	0.000E+00	0.000E+00	2.759E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.759E+01
Th-230	2.211E-01	0.000E+00	0.000E+00	0.000E+00	2.759E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.759E+01
U-234	2.193E-01	0.000E+00	0.000E+00	0.000E+00	2.736E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.736E+01
U-235	2.193E-01	0.000E+00	0.000E+00	0.000E+00	2.736E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.736E+01
U-238	2.193E-01	0.000E+00	0.000E+00	0.000E+00	2.736E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.736E+01

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 3.000E+00 years

Radon	Radionuclides							
Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	3.123E-07	0.1216	4.596E-08	0.0179	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.759E-08	0.0069
Pa-231	2.996E-08	0.0117	1.669E-08	0.0065	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.175E-09	0.0024
Pb-210	9.265E-10	0.0004	6.800E-09	0.0026	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.499E-08	0.0370
Ra-226	1.838E-06	0.7156	6.252E-09	0.0024	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.420E-08	0.0055
Th-230	1.806E-10	0.0001	7.519E-09	0.0029	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.283E-09	0.0013
U-234	5.532E-11	0.0000	6.087E-09	0.0024	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.609E-09	0.0010
U-235	1.177E-07	0.0458	5.475E-09	0.0021	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.668E-09	0.0010
U-238	2.441E-08	0.0095	5.175E-09	0.0020	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.295E-09	0.0013
Total	2.323E-06	0.9047	9.996E-08	0.0389	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.448E-07	0.0564

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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.759E-07	0.1464
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.282E-08	0.0206
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.027E-07	0.0400
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.858E-06	0.7235
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.098E-08	0.0043
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.752E-09	0.0034
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.259E-07	0.0490
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.288E-08	0.0128
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.568E-06	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+00 years

Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground risk	Ground fract.	Inhalation risk	Inhalation fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	Soil risk	Soil fract.
Ac-227	2.792E-07	0.1087	4.109E-08	0.0160	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.573E-08	0.0061
Pa-231	6.310E-08	0.0246	2.156E-08	0.0084	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.041E-09	0.0031
Pb-210	8.310E-10	0.0003	6.100E-09	0.0024	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.520E-08	0.0332
Ra-226	1.835E-06	0.7145	6.943E-09	0.0027	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.396E-08	0.0093
Th-230	2.965E-09	0.0012	7.529E-09	0.0029	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.312E-09	0.0013
U-234	5.537E-11	0.0000	6.088E-09	0.0024	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.609E-09	0.0010
U-235	1.177E-07	0.0458	5.476E-09	0.0021	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.668E-09	0.0010
U-238	2.441E-08	0.0095	5.175E-09	0.0020	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.295E-09	0.0013
Total	2.323E-06	0.9047	9.996E-08	0.0389	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.448E-07	0.0564

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

Water Dependent Pathways

Radio-Nuclide	Water risk	Water fract.	Fish risk	Fish fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	All pathways risk	All pathways fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.360E-07	0.1308
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.270E-08	0.0361
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.213E-08	0.0359
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.866E-06	0.7266
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.381E-08	0.0054
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.752E-09	0.0034
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.259E-07	0.0490
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.288E-08	0.0128
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.568E-06	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.000E+01 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	2.073E-01	0.000E+00	0.000E+00	0.000E+00	2.587E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.587E+01
Pa-231	2.150E-01	0.000E+00	0.000E+00	0.000E+00	2.682E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.682E+01
Pb-210	2.210E-01	0.000E+00	0.000E+00	0.000E+00	2.758E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.758E+01
Ra-226	2.212E-01	0.000E+00	0.000E+00	0.000E+00	2.759E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.759E+01
Th-230	2.211E-01	0.000E+00	0.000E+00	0.000E+00	2.759E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.759E+01
U-234	2.150E-01	0.000E+00	0.000E+00	0.000E+00	2.682E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.682E+01
U-235	2.150E-01	0.000E+00	0.000E+00	0.000E+00	2.682E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.682E+01
U-238	2.150E-01	0.000E+00	0.000E+00	0.000E+00	2.682E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.682E+01

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.000E+01 years

Radon	Radionuclides							
Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.990E-07	0.1174	4.401E-08	0.0173	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.684E-08	0.0066
Pa-231	2.937E-08	0.0115	1.636E-08	0.0064	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.053E-09	0.0024
Pb-210	9.261E-10	0.0004	6.798E-09	0.0027	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.495E-08	0.0373
Ra-226	1.837E-06	0.7213	6.252E-09	0.0025	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.420E-08	0.0056
Th-230	1.806E-10	0.0001	7.517E-09	0.0030	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.283E-09	0.0013
U-234	5.423E-11	0.0000	5.967E-09	0.0023	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.558E-09	0.0010
U-235	1.154E-07	0.0453	5.367E-09	0.0021	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.615E-09	0.0010
U-238	2.393E-08	0.0094	5.073E-09	0.0020	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.230E-09	0.0013
Total	2.306E-06	0.9054	9.734E-08	0.0382	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.437E-07	0.0564

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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.599E-07	0.1413
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.178E-08	0.0203
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.027E-07	0.0403
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.858E-06	0.7293
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.098E-08	0.0043
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.579E-09	0.0034
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.234E-07	0.0484
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.224E-08	0.0127
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.547E-06	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+01 years

Radionuclides

Radon							
Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.126E-07	0.0835	3.129E-08	0.0123	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.198E-08	0.0047
Pa-231	1.157E-07	0.0454	2.906E-08	0.0114	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.092E-08	0.0043
Pb-210	6.682E-10	0.0003	4.905E-09	0.0019	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.851E-08	0.0269
Ra-226	1.829E-06	0.7181	8.113E-09	0.0032	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.052E-08	0.0159
Th-230	8.519E-09	0.0033	7.549E-09	0.0030	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.410E-09	0.0013
U-234	5.464E-11	0.0000	5.968E-09	0.0023	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.558E-09	0.0010
U-235	1.154E-07	0.0453	5.372E-09	0.0021	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.617E-09	0.0010
U-238	2.393E-08	0.0094	5.073E-09	0.0020	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.230E-09	0.0013
Total	2.306E-06	0.9054	9.734E-08	0.0382	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.437E-07	0.0564

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.559E-07	0.1005
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.557E-07	0.0611
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.408E-08	0.0291
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.878E-06	0.7372
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.948E-08	0.0076
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.581E-09	0.0034
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.234E-07	0.0484
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.224E-08	0.0127
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.547E-06	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 3.000E+01 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.874E-01	0.000E+00	0.000E+00	0.000E+00	2.338E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.338E+01
Pa-231	2.031E-01	0.000E+00	0.000E+00	0.000E+00	2.534E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.534E+01
Pb-210	2.209E-01	0.000E+00	0.000E+00	0.000E+00	2.756E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.756E+01
Ra-226	2.211E-01	0.000E+00	0.000E+00	0.000E+00	2.759E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.759E+01
Th-230	2.210E-01	0.000E+00	0.000E+00	0.000E+00	2.757E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.757E+01
U-234	2.031E-01	0.000E+00	0.000E+00	0.000E+00	2.534E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.534E+01
U-235	2.031E-01	0.000E+00	0.000E+00	0.000E+00	2.534E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.534E+01
U-238	2.031E-01	0.000E+00	0.000E+00	0.000E+00	2.534E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.534E+01

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 3.000E+01 years

Radon	Radionuclides							
Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.704E-07	0.1081	3.979E-08	0.0159	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.523E-08	0.0061
Pa-231	2.775E-08	0.0111	1.545E-08	0.0062	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.718E-09	0.0023
Pb-210	9.254E-10	0.0004	6.793E-09	0.0027	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.488E-08	0.0379
Ra-226	1.837E-06	0.7347	6.252E-09	0.0025	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.420E-08	0.0057
Th-230	1.805E-10	0.0001	7.512E-09	0.0030	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.281E-09	0.0013
U-234	5.123E-11	0.0000	5.638E-09	0.0023	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.416E-09	0.0010
U-235	1.090E-07	0.0436	5.070E-09	0.0020	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.470E-09	0.0010
U-238	2.261E-08	0.0090	4.792E-09	0.0019	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.052E-09	0.0012
Total	2.268E-06	0.9070	9.130E-08	0.0365	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.412E-07	0.0565

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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.254E-07	0.1301
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.892E-08	0.0196
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.026E-07	0.0410
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.858E-06	0.7429
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.097E-08	0.0044
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.105E-09	0.0032
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.166E-07	0.0466
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.045E-08	0.0122
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.501E-06	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+01 years

Radionuclides

Radon							
Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	9.766E-08	0.0391	1.437E-08	0.0057	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.501E-09	0.0022
Pa-231	2.004E-07	0.0801	4.085E-08	0.0163	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.544E-08	0.0062
Pb-210	3.584E-10	0.0001	2.630E-09	0.0011	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.674E-08	0.0147
Ra-226	1.814E-06	0.7253	1.030E-08	0.0041	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.171E-08	0.0287
Th-230	2.429E-08	0.0097	7.624E-09	0.0030	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.908E-09	0.0016
U-234	5.450E-11	0.0000	5.639E-09	0.0023	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.417E-09	0.0010
U-235	1.091E-07	0.0436	5.090E-09	0.0020	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.478E-09	0.0010
U-238	2.261E-08	0.0090	4.793E-09	0.0019	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.052E-09	0.0012
Total	2.268E-06	0.9070	9.130E-08	0.0365	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.412E-07	0.0565

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.175E-07	0.0470
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.567E-07	0.1026
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.973E-08	0.0159
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.896E-06	0.7581
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.582E-08	0.0143
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.111E-09	0.0032
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.167E-07	0.0467
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.045E-08	0.0122
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.501E-06	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.000E+02 years

	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Radio-Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.475E-01	0.000E+00	0.000E+00	0.000E+00	1.840E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.840E+01
Pa-231	1.664E-01	0.000E+00	0.000E+00	0.000E+00	2.076E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.076E+01
Pb-210	2.206E-01	0.000E+00	0.000E+00	0.000E+00	2.753E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.753E+01
Ra-226	2.211E-01	0.000E+00	0.000E+00	0.000E+00	2.758E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.758E+01
Th-230	2.204E-01	0.000E+00	0.000E+00	0.000E+00	2.750E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.750E+01
U-234	1.664E-01	0.000E+00	0.000E+00	0.000E+00	2.076E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.076E+01
U-235	1.664E-01	0.000E+00	0.000E+00	0.000E+00	2.076E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.076E+01
U-238	1.664E-01	0.000E+00	0.000E+00	0.000E+00	2.076E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.076E+01

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.000E+02 years

	Radionuclides							
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.130E-07	0.0890	3.134E-08	0.0131	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.200E-08	0.0050
Pa-231	2.274E-08	0.0095	1.266E-08	0.0053	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.686E-09	0.0020
Pb-210	9.245E-10	0.0004	6.786E-09	0.0028	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.478E-08	0.0396
Ra-226	1.837E-06	0.7672	6.250E-09	0.0026	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.420E-08	0.0059
Th-230	1.801E-10	0.0001	7.495E-09	0.0031	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.273E-09	0.0014
U-234	4.198E-11	0.0000	4.620E-09	0.0019	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.980E-09	0.0008
U-235	8.934E-08	0.0373	4.155E-09	0.0017	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.024E-09	0.0008
U-238	1.853E-08	0.0077	3.927E-09	0.0016	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.501E-09	0.0010
Total	2.181E-06	0.9112	7.724E-08	0.0323	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.354E-07	0.0566

Intrisk : NFSS VP H Prime Construction Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.563E-07	0.1071
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.009E-08	0.0167
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.025E-07	0.0428
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.857E-06	0.7757
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.095E-08	0.0046
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.642E-09	0.0028
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.552E-08	0.0399
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.496E-08	0.0104
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.394E-06	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+02 years

Radionuclides

Radon							
Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground risk	Ground fract.	Inhalation risk	Inhalation fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	Soil risk	Soil fract.
Ac-227	6.414E-09	0.0027	9.439E-10	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.613E-10	0.0002
Pa-231	2.289E-07	0.0956	4.298E-08	0.0180	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.629E-08	0.0068
Pb-210	4.049E-11	0.0000	2.972E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.151E-09	0.0017
Ra-226	1.759E-06	0.7349	1.227E-08	0.0051	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.014E-07	0.0424
Th-230	7.832E-08	0.0327	7.956E-09	0.0033	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.686E-09	0.0028
U-234	7.456E-11	0.0000	4.625E-09	0.0019	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.983E-09	0.0008
U-235	8.972E-08	0.0375	4.230E-09	0.0018	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.053E-09	0.0009
U-238	1.853E-08	0.0077	3.928E-09	0.0016	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.501E-09	0.0010
Total	2.181E-06	0.9112	7.724E-08	0.0323	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.354E-07	0.0566

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Dependent Pathways

Radio-Nuclide	Water risk	Water fract.	Fish risk	Fish fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	All pathways risk	All pathways fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.719E-09	0.0032
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.882E-07	0.1204
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.489E-09	0.0019
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.873E-06	0.7824
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.296E-08	0.0388
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.682E-09	0.0028
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.600E-08	0.0401
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.496E-08	0.0104
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.394E-06	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 3.000E+02 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	8.319E-02	0.000E+00	0.000E+00	0.000E+00	1.038E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.038E+01
Pa-231	9.422E-02	0.000E+00	0.000E+00	0.000E+00	1.176E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.176E+01
Pb-210	2.204E-01	0.000E+00	0.000E+00	0.000E+00	2.749E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.749E+01
Ra-226	2.208E-01	0.000E+00	0.000E+00	0.000E+00	2.755E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.755E+01
Th-230	2.189E-01	0.000E+00	0.000E+00	0.000E+00	2.731E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.731E+01
U-234	9.422E-02	0.000E+00	0.000E+00	0.000E+00	1.176E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.176E+01
U-235	9.422E-02	0.000E+00	0.000E+00	0.000E+00	1.176E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.176E+01
U-238	9.422E-02	0.000E+00	0.000E+00	0.000E+00	1.176E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.176E+01

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 3.000E+02 years

Radon	Radionuclides							
Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.201E-07	0.0544	1.768E-08	0.0080	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.768E-09	0.0031
Pa-231	1.287E-08	0.0058	7.169E-09	0.0032	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.653E-09	0.0012
Pb-210	9.233E-10	0.0004	6.777E-09	0.0031	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.466E-08	0.0429
Ra-226	1.834E-06	0.8311	6.242E-09	0.0028	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.418E-08	0.0064
Th-230	1.788E-10	0.0001	7.442E-09	0.0034	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.250E-09	0.0015
U-234	2.377E-11	0.0000	2.616E-09	0.0012	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.121E-09	0.0005
U-235	5.058E-08	0.0229	2.352E-09	0.0011	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.146E-09	0.0005
U-238	1.049E-08	0.0048	2.223E-09	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.416E-09	0.0006
Total	2.030E-06	0.9195	5.250E-08	0.0238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.252E-07	0.0567

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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.446E-07	0.0655
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.270E-08	0.0103
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.024E-07	0.0464
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.855E-06	0.8403
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.087E-08	0.0049
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.760E-09	0.0017
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.408E-08	0.0245
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.413E-08	0.0064
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.207E-06	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+02 years

Radionuclides

Radon							
Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.680E-12	0.0000	3.945E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.510E-13	0.0000
Pa-231	1.322E-07	0.0599	2.470E-08	0.0112	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.365E-09	0.0042
Pb-210	7.973E-14	0.0000	5.852E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.174E-12	0.0000
Ra-226	1.612E-06	0.7304	1.152E-08	0.0052	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.677E-08	0.0438
Th-230	2.231E-07	0.1011	8.926E-09	0.0040	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.530E-08	0.0069
U-234	2.600E-10	0.0001	2.629E-09	0.0012	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.138E-09	0.0005
U-235	5.136E-08	0.0233	2.500E-09	0.0011	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.202E-09	0.0005
U-238	1.049E-08	0.0048	2.226E-09	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.417E-09	0.0006
Total	2.030E-06	0.9195	5.250E-08	0.0238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.252E-07	0.0567

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.226E-12	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.663E-07	0.0753
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.839E-12	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.721E-06	0.7795
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.473E-07	0.1120
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.026E-09	0.0018
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.506E-08	0.0249
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.413E-08	0.0064
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.207E-06	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.000E+03 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.136E-02	0.000E+00	0.000E+00	0.000E+00	1.417E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.417E+00
Pa-231	1.287E-02	0.000E+00	0.000E+00	0.000E+00	1.605E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.605E+00
Pb-210	2.186E-01	0.000E+00	0.000E+00	0.000E+00	2.728E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.728E+01
Ra-226	2.190E-01	0.000E+00	0.000E+00	0.000E+00	2.732E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.732E+01
Th-230	2.130E-01	0.000E+00	0.000E+00	0.000E+00	2.657E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.657E+01
U-234	1.287E-02	0.000E+00	0.000E+00	0.000E+00	1.605E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.605E+00
U-235	1.287E-02	0.000E+00	0.000E+00	0.000E+00	1.605E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.605E+00
U-238	1.287E-02	0.000E+00	0.000E+00	0.000E+00	1.605E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.605E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.000E+03 years

Radon	Radionuclides							
Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.641E-08	0.0083	2.415E-09	0.0012	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.242E-10	0.0005
Pa-231	1.758E-09	0.0009	9.791E-10	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.623E-10	0.0002
Pb-210	9.160E-10	0.0005	6.724E-09	0.0034	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.391E-08	0.0473
Ra-226	1.819E-06	0.9168	6.191E-09	0.0031	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.406E-08	0.0071
Th-230	1.740E-10	0.0001	7.241E-09	0.0036	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.162E-09	0.0016
U-234	3.246E-12	0.0000	3.572E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.531E-10	0.0001
U-235	6.908E-09	0.0035	3.212E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.565E-10	0.0001
U-238	1.433E-09	0.0007	3.036E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.934E-10	0.0001
Total	1.847E-06	0.9307	2.453E-08	0.0124	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.129E-07	0.0569

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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.975E-08	0.0100
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.100E-09	0.0016
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.016E-07	0.0512
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.840E-06	0.9270
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.058E-08	0.0053
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.136E-10	0.0003
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.386E-09	0.0037
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.930E-09	0.0010
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.985E-06	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+03 years

Radionuclides

Radon							
Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground risk	Ground fract.	Inhalation risk	Inhalation fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	Soil risk	Soil fract.
Ac-227	4.000E-24	0.0000	5.887E-25	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.253E-25	0.0000
Pa-231	1.780E-08	0.0090	3.324E-09	0.0017	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.260E-09	0.0006
Pb-210	2.701E-23	0.0000	1.983E-22	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.769E-21	0.0000
Ra-226	1.187E-06	0.5983	8.484E-09	0.0043	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.127E-08	0.0359
Th-230	6.318E-07	0.3183	1.164E-08	0.0059	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.978E-08	0.0200
U-234	1.406E-09	0.0007	3.877E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.425E-10	0.0001
U-235	7.279E-09	0.0037	3.909E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.830E-10	0.0001
U-238	1.433E-09	0.0007	3.047E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.938E-10	0.0001
Total	1.847E-06	0.9307	2.453E-08	0.0124	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.129E-07	0.0569

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

Water Dependent Pathways

Radio-Nuclide	Water risk	Water fract.	Fish risk	Fish fract.	Radon risk	Radon fract.	Plant risk	Plant fract.	Meat risk	Meat fract.	Milk risk	Milk fract.	All pathways risk	All pathways fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.814E-24	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.238E-08	0.0113
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.995E-21	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.267E-06	0.6385
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.832E-07	0.3443
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.037E-09	0.0010
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.853E-09	0.0040
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.932E-09	0.0010
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.985E-06	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides