**CORRECTIVE ACTION DECISION
DOCUMENT/CLOSURE REPORT
FOR CORRECTIVE ACTION UNIT 383:
AREA 12 E-TUNNEL SITES,
NEVADA TEST SITE**

Controlled Copy No: _____

Revision No.: 0

February 2007
(Republished March 2010)

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Prepared by
Defense Threat Reduction Agency
Mercury, Nevada

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List of Acronyms and Abbreviations

Am	Americium
ASTM	American Society for Testing and Materials
bgs	Below ground surface
CADD/CR	Corrective Action Decision Document/Closure Report
CAI	Corrective Action Investigation
CAIP	Corrective Action Investigation Plan
CAS	Corrective Action Site
CAU	Corrective Action Unit
cm ³ /cm ³	Cubic centimeters per cubic centimeter
Co	Cobalt
COC	Contaminant of concern
COPC	Contaminant of potential concern
Cs	Cesium
CSM	Conceptual site model
day/yr	Days per year
DOE	U.S. Department of Energy
DQA	Data quality assessment
DQI	Data quality indicator
DQO	Data quality objective
DRO	Diesel-range organics
DTRA	Defense Threat Reduction Agency
EPA	U.S. Environmental Protection Agency
FAL	Final action level
FFACO	<i>Federal Facility Agreement and Consent Order</i>
ft	Foot
g/g	Grams per gram
HASL	Health and Safety Laboratory
kg/day	Kilograms per day
MDC	Minimum detectable concentration
mg/kg	Milligrams per kilogram
N/A	Not applicable
NAC	<i>Nevada Administrative Code</i>
NCRP	National Council of Radiation Protection and Measurements

List of Acronyms and Abbreviations (Continued)

NDEP	Nevada Division of Environmental Protection
NTS	Nevada Test Site
PAL	Preliminary action level
pCi/g	Picocuries per gram
POC	Performance Objective for the Certification of Nonradioactive Hazardous Waste
PRG	Preliminary remediation goal
QA	Quality assurance
QC	Quality control
ORNL	Oak Ridge National Laboratory
Pu	Plutonium
QAPP	<i>Quality Assurance Project Plan</i>
RBSL	Risk-based screening level
RCRA	<i>Resource Conservation and Recovery Act</i>
RESRAD	Residual Radioactive
RPD	Relative percent difference
RT	Regulatory threshold
Sr	Strontium
SSTL	Site-specific target level
SVOC	Semivolatile organic compound
Th	Thorium
TPH	Total petroleum hydrocarbons
VOC	Volatile organic compound
yd ³	Cubic yard
yr	Year
Fg/kg	Micrograms per kilogram

Executive Summary

This Corrective Action Decision Document/Closure Report (CADD/CR) was prepared by the Defense Threat Reduction Agency (DTRA) for Corrective Action Unit (CAU) 383, Area 12 E-Tunnel Sites, which is the joint responsibility of DTRA and the U.S. Department of Energy (DOE), National Nuclear Security Administration Nevada Site Office (NNSA/NSO). This CADD/CR is consistent with the requirements of the *Federal Facility Agreement and Consent Order* (FFACO) agreed to by the State of Nevada, the DOE, and the U.S. Department of Defense. Corrective Action Unit 383 is comprised of three Corrective Action Sites (CASs) and two adjacent areas:

- CAS 12-06-06, Muckpile
- CAS 12-25-02, Oil Spill
- CAS 12-28-02, Radioactive Material
- Drainage below the Muckpile
- Ponds 1, 2, and 3

The purpose of this CADD/CR is to provide justification and documentation to support the recommendation for closure with no further corrective action, by placing use restrictions at the three CASs and two adjacent areas of CAU 383. To support this recommendation, a corrective action investigation (CAI) was performed in May and June 2004. The purpose of the CAI was to fulfill the following data needs as defined during the data quality objective (DQO) process:

- Determine whether contaminants of concern (COCs) are present.
- If COCs are present, determine their nature and extent.
- Provide sufficient information and data to determine appropriate corrective actions.

The CAU 383 dataset from the CAI was evaluated based on the data quality indicator parameters. This evaluation demonstrated the quality and acceptability of the dataset for use in fulfilling the DQO data needs.

Analytes detected during the CAI were evaluated against final action levels (FALs) established in this document. Tier 2 FALS were calculated for the semivolatile organic compound (SVOC) benzo(a)pyrene and the radionuclides americium (Am)-241, cesium (Cs)-137, plutonium (Pu)-238, and Pu-239. The Tier 2 FALs were calculated for the detected SVOC (benzo(a)pyrene) and

radionuclides using site-specific information (see Appendix D of this document). The SVOC FAL was calculated using the Oak Ridge National Laboratory (ORNL) risk calculations provided on the website http://risk.lsd.ornl.gov/cgi-bin/prg/PRG_search. The radionuclide FALs were calculated using the Residual Radioactive (RESRAD) code (version 6.21). Although all detected radionuclides at a CAS are used in the sum-of-fractions calculation and a unique Tier 2 action level is developed for all radionuclides, only the five radionuclides that initially exceeded Tier 1 levels have a Tier 2-based FAL. The CAS-specific FALS established for these radionuclides are the site-specific target levels listed in [Table D.1-7](#).

Based on the field investigation, no chemical or radiological constituents exceeded their FALs at CAS 12-28-02, the drainage, and the ponds. However, the following contaminants were determined to be present at concentrations exceeding their corresponding FALs:

- Benzo(a)pyrene at one location in CAS 12-25-02
- Am-241, Cs-137, Pu-238, and Pu-239 at CAS 12-06-06

Based on the data and risk evaluations (Tier 2 evaluations), the DQO data needs presented in the Corrective Action Investigation Plan (CAIP) were met, and the data accurately represent the radiological and chemical risks present at CAU 383. Based on the results of the CAI data evaluation and results showing there was no lateral or vertical migration, it was determined that the closure in place with use restrictions is the appropriate corrective action for CAU 383 and that use restrictions will effectively control exposure to future land users. Therefore, DTRA and NNSA/NSO provide the following recommendations:

- Close COCs in place at CAS 12-06-06 and 12-25-02 with use restrictions.
- No further action for CAU 383.
- A Notice of Completion be issued to DTRA and NNSA/NSO by the Nevada Division of Environmental Protection for closure of CAU 383.
- Move CAU 383 from Appendix III to Appendix IV of the FFACO.

1.0 Introduction

This Corrective Action Decision Document/Closure Report (CADD/CR) has been prepared for Corrective Action Unit (CAU) 383, Area 12 E-Tunnel Sites, Nevada Test Site (NTS), Nevada. The corrective action proposed in this document is in accordance with the *Federal Facility Agreement and Consent Order* (FFACO) that was agreed to by the State of Nevada, the U.S. Department of Energy (DOE), and the U.S. Department of Defense (FFACO, 1996).

The E-Tunnel Muckpile is identified under FFACO classification as CAU 383, Area 12 E-Tunnel Sites. The CAU consists of three Corrective Action Sites (CASs): 12-06-06, Muckpile; 12-25-02, Oil Spill; and 12-28-02 Radioactive Material. In addition, the drainage between the Muckpile and the ponds and Ponds 1, 2, and 3 were included in the investigation. The E-Tunnel Sites are located approximately 42 miles north of Mercury in Area 12 of the NTS ([Figure 1-1](#)).

This CADD/CR describes the corrective action that is selected as a result of the investigation activities and the rationale for its selection. The rationale consists of a justification for closure in place with use restrictions in accordance with Sections IV.8 and IV.11 of the FFACO (1996).

1.1 Purpose

The purpose of this CADD/CR is to provide justification for the closure of CAU 383 with no further action based on the results of the corrective action investigation (CAI). The CAI was conducted in accordance with the *Corrective Action Investigation Plan (CAIP) for Corrective Action Unit 383: Area 12 E-Tunnel Sites, Nevada Test Site* (DTRA, 2003), which provides additional information relating to the history, planning, and scope of the investigation.

The E-Tunnel was used for nine nuclear weapons tests between 1958 and 1977. The Muckpile contains an estimated 355,000 cubic yards (yd³) of material consisting primarily of mining debris (rock) generated during excavation of the underground facilities; construction/re-entry debris comprise the remainder of the Muckpile. The drainage and Ponds 1, 2, and 3, which were included in this investigation, trend easterly and extend approximately 350 feet (ft) down canyon from the Muckpile. Corrective Action Site 12-28-02 (Radioactive Material) is located at the E-Tunnel main portal and is part of the Muckpile. Corrective Action Site 12-25-02 (Oil Spill) is located on the blower pad, which is on a bench approximately 100 ft above the E-Tunnel south portal.

Figure 1-1
E-Tunnel Sites Location Map, Area 12, Nevada Test Site

1.2 Scope

The scope of this CADD/CR is to justify and recommend that no further corrective action is required at CAU 383, Area 12 E-Tunnel Sites. To achieve this scope, the following actions were implemented:

- Evaluation of current site conditions, including the nature and extent of contaminants of concern (COCs).
- Closure in place with use restrictions to prevent exposure of industrial and construction workers to unacceptable risks.

1.3 CADD/CR Contents

This CADD/CR is divided into the following sections:

- [Section 1.0](#) - Introduction: Summarizes of the purpose, scope, and contents of this CADD/CR.
- [Section 2.0](#) - CAI Summary: Summarizes the investigation field activities, the results of the investigation, and the data quality objective (DQO) assessment.
- [Section 3.0](#) - Recommendation: States why no further action is required.
- [Section 4.0](#) - References: Lists all documents referenced in the CADD/CR.
- [Appendix A](#) - Corrective Action Investigation Results
- [Appendix B](#) - Data Quality Objective Process for CAU 383, Area 12 E-Tunnel Sites
- [Appendix C](#) - Data Assessment
- [Appendix D](#) - Risk Assessment for CAU 383

All work was performed in accordance with the following documents:

- *Corrective Action Investigation Plan for Corrective Action Unit 383: E-Tunnel Sites, Nevada Test Site, Nevada*, Rev. 0 (DTRA, 2003)
- *Industrial Sites Quality Assurance Project Plan (QAPP), Nevada Test Site, Nevada*, Rev. 3 (NNSA/NV, 2002)
- *Federal Facility Agreement and Consent Order (FFACO, 1996)*

- *SNJV Site-Specific Health and Safety Plan, DTRA CAU 383 E-Tunnel Muckpile, Nevada Test Site, Rev 0. (SNJV, 2003)*

The DQOs identified in the CAIP are as follows:

- Determine whether COCs are present.
- If COCs are present, determine their nature and extent. Obtain sufficient information to evaluate potential corrective action alternatives.

The data quality indicators (DQIs) as defined in the Industrial Sites QAPP (NNSA/NV, 2002) were achieved, and the DQOs established in the CAIP were met.

2.0 ***Corrective Action Investigation Summary***

The following sections describe and summarize the results of the CAI activities conducted at CAU 383. For detailed CAI results, refer to [Appendix A](#).

2.1 ***Investigation Activities***

Corrective action investigation activities were performed at the E-Tunnel Sites as set forth in the CAIP (DTRA, 2003) between May 19 and June 24, 2004. The purpose of the CAI was to determine whether or not the E-Tunnel Muckpile and ponds; the underlying native soils; and/or the drainage below the Muckpile, the Oil Spill, and Radioactive Material have been impacted by COCs at concentrations that exceed final action levels (FALs), and to provide sufficient information and data to justify closure in place with administrative controls. In accordance with the CAIP (DTRA, 2003), the following tasks were performed:

- **Radiological surveys** - Before commencing drilling and sampling, walk-over and drive-over radiological surveys were conducted to identify surface and near-surface areas with elevated readings.
- **Sampling of the Muckpile (muck) and underlying native material (CAS 12-06-06)** - Thirty-four locations were drilled or hand sampled on the Muckpile to characterize the muck and the native material under the Muckpile. A total of 1,039.5 ft was drilled in 32 boreholes ranging from 1.5 to 91.5 ft deep. Two locations were sampled by hand. Up to three samples were collected from each location. One location was drilled but not sampled. During the characterization, 66 environmental samples were collected. These included 41 muck samples and 25 native material samples. All samples were sent to Paragon Analytics, Inc., for analysis. Analyses performed included volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), total petroleum hydrocarbons (TPH)-diesel-range organics (DRO), total *Resource Conservation and Recovery Act* (RCRA) metals, beryllium, and radionuclides (including strontium [Sr]-90 and isotopic plutonium [Pu]).
- **Sampling of the drainage (included with CAS 12-06-06)** - Thirty-five locations were drilled or hand sampled in the drainage to characterize the site. A total of 10 ft was drilled in two boreholes 5 ft deep. Thirty-three locations were sampled by hand. One sample was collected from each location. During the characterization, 35 environmental samples were collected. All samples were sent to Paragon Analytics, Inc., to be analyzed for the same analyses as the Muckpile samples.

- **Sampling of the pond sediments and underlying native material (included with CAS 12-06-06)** - Nine locations were drilled or hand sampled in the ponds to characterize the sediment and the native material under the sediments. In Pond 1, a total of 80 ft was drilled in five boreholes ranging from depths of 18 to 21 ft. Due to soil wetness in Ponds 2 and 3, only two locations were sampled in each pond, and each of the four locations was hand sampled. During the characterization, 14 environmental samples were collected. These included nine sediment samples and five native material samples. All samples were sent to Paragon Analytics, Inc., to be analyzed for the same analyses as the Muckpile samples.
- **Sampling of the Oil Spill (CAS 12-25-02)** - One sample was collected from each of eight locations in the Oil Spill to characterize the site. All samples were sent to Paragon Analytics, Inc., to be analyzed for the same analyses as the Muckpile samples.
- **Sampling of the Radioactive Material (CAS 12-28-02)** - One sample was collected from each of four locations in the Radioactive Material area to characterize the site. All samples were sent to Paragon Analytics, Inc., to be analyzed for the same analyses as the Muckpile samples.
- **Additional Sampling** - Background and preliminary soil samples were collected at eight locations on and around the Muckpile. Three background samples were hand collected at three undisturbed locations around the Muckpile. Five preliminary samples were collected by hand at five biased locations on the Muckpile. Seven of the samples were analyzed for beryllium, RCRA metals, and radionuclides; and one sample, 383GB0901, was analyzed only for radionuclides (Sr-90, isotopic Pu, and gamma spec). Analysis was conducted by Paragon Analytics, Inc.

The conceptual site model (CSM) postulated the following:

- The majority of the Muckpile does not contain contaminants of potential concern (COPCs), and if any are present, they are probably isolated.
- The location of buried COPCs cannot be predicted, but surface radiological surveys can be used to increase the probability of finding impacted areas.
- It is possible, but unlikely based on experience, that the native soil beneath the Muckpile and ponds has been impacted by downward migration of COPCs.
- Releases to the Muckpile from surface activities of concern (equipment maintenance and storage of equipment and petroleum products) may be locally significant. These releases, if present, are expected to have limited lateral and vertical extent.

- The most likely pathway for migration of contaminants away from the Muckpile is in stormwater runoff. Migration might also result when precipitation infiltrates into the thin, peripheral portions of the Muckpile and enters the native material and/or drains, downgrading along the contact between the fill and the underlying native alluvium or bedrock.

Although the first CSM postulate was shown to be incorrect, the other postulates and the assumptions used to develop the CSM (DTRA, 2003) were proven to be correct by the CAI. The fact that the contamination is more widespread than anticipated does not invalidate the rest of the model. The more important concepts of the model, that there was no leaching into the native material and that migration is taking place from the Muckpile in storm runoff, were shown to be correct.

2.2 Results

The following is a summary of the data obtained during the CAI.

2.2.1 Summary of Analytical Data

Chemical and radiological results for investigation samples collected at each of the CASs are summarized in [Sections 2.2.1.1 through 2.2.1.3](#). Preliminary action levels (PALs) for the CAU 383 investigation were determined during the DQO process and are discussed in Section 3.3 of the CAIP (DTRA, 2003). Final action levels are presented in [Section 2.3.1](#), and details about the methods used during this investigation and a comparison of the environmental sample results to the FALs are presented in [Appendix D](#).

2.2.1.1 Muckpile (CAS 12-06-06); Drainage; and Ponds 1, 2, and 3

During the CAI, TPH-DRO was found above the PAL of 100 milligrams per kilogram (mg/kg) in three soil samples and one pond sediment sample, so it was moved into a Tier 2 evaluation. The Tier 2 evaluation involved evaluating the individual hazardous constituents of TPH-DRO as prescribed in the American Society for Testing and Materials (ASTM) Method E 1739-95, Section 6.4.3, "Use of Total Petroleum Hydrocarbon Measurements" (ASTM, 1995). The Tier 2 evaluation determined that none of the hazardous constituents of TPH-DRO exceeded their respective PALs. Therefore, for those chemical constituents, the PALs are identified as the FALs.

For the chemical constituents, only benzo(a)pyrene was detected in one sample (383MB1000.5) that exceeded the PAL of 0.21 mg/kg, so it was moved to a Tier 2 analysis, and the Oak Ridge

National Laboratory (ORNL) website was used to calculate the site-specific FAL (ORNL, 2004). For all other constituents, the PALs are identified as the FALs. The maximum concentration of each detected chemical contaminant at this CAS is listed in [Table 2-1](#).

Table 2-1
Maximum Reported Chemical Values for CAS 12-06-06;
Ponds 1, 2, and 3; and Drainage
(Page 1 of 4)

Contaminant of Concern	Results	Sample Number	Depth (ft bgs)	FAL	Units
Muckpile					
Arsenic	6	383MH0353.5	53 - 54	23	mg/kg
Barium	7,000	383MB0600.5	0 - 1	67,000	mg/kg
Beryllium	2.4	383MB1200.5	0 - 1	1,900	mg/kg
Cadmium	15	383MB0400.5	0 - 1	450	mg/kg
Chromium	33	383MB0200.5	0 - 1	450	mg/kg
Lead	160	383MH1734.5	34 - 35	800	mg/kg
Selenium	0.99	383MB0559.5	59 - 60	310	mg/kg
Silver	2.8	383MH1734.5	34 - 35	5,100	mg/kg
Mercury	0.51	383MH0353.5	53 - 54	5,100	mg/kg
Diesel-Range Organics ¹	700	383MH0600.5	0 - 1	100	mg/kg
1,2,4-Trimethylbenzene	0.0072	383MB0800.5	0 - 1	170	mg/kg
1,3,5-Trimethylbenzene	0.0072	383MB0800.5	0 - 1	70	mg/kg
Acetone	0.018	383MH1422.0	21.5 - 22.5	54,000	mg/kg
Hexachlorobutadiene	0.0015	383MH1503.5	3 - 4	22	mg/kg
Ethylbenzene	0.12	383MB0800.5	0 - 1	400	mg/kg
M+P-Xylene	1.5	383MB0800.5	0 - 1	420	mg/kg
Methylene Chloride	0.0013	383MB0586.0	0 - 1	21	mg/kg
O-Xylene	1	383MB0800.5	0 - 1	420	mg/kg
Acenaphthene	0.022	383MB1000.5	0 - 1	29,000	mg/kg
Anthracene	0.17	383MB1000.5	0 - 1	100,000	mg/kg
Benzo(A)Anthracene	1.2	383MB1000.5	0 - 1	2.1	mg/kg
Benzo(A)Pyrene	1.3	383MB1000.5	0 - 1	152	mg/kg
Benzo(B)Fluoranthene	1.7	383MB1000.5	0 - 1	2.1	mg/kg
Benzo(K)Fluoranthene	0.65	383MB1000.5	0 - 1	21	mg/kg

Table 2-1
Maximum Reported Chemical Values for CAS 12-06-06;
Ponds 1, 2, and 3; and Drainage
(Page 2 of 4)

Contaminant of Concern	Results	Sample Number	Depth (ft bgs)	FAL	Units
Bis(2-Ethylhexyl)Phthalate	0.22	383MB1425.5	25 - 26	120	mg/kg
Butyl Benzyl Phthalate	0.035	383MH1100.5	0 - 1	100,000	mg/kg
Carbazole	0.057	383MB1000.5	0 - 1	86	mg/kg
Chrysene	1	383MB1000.5	0 - 1	210	mg/kg
Dibenzofuran	0.065	383MB1000.5	0 - 1	1,600	mg/kg
Fluoranthene	1.5	383MB1000.5	0 - 1	22,000	mg/kg
Fluorene	0.016	383MB1000.5	0 - 1	26,000	mg/kg
Ideno(1,2,3-Cd)Pyrene	0.63	383MB1000.5	0 - 1	2.1	mg/kg
Naphthalene	0.019	383MB1000.5	0 - 1	190	mg/kg
Pyrene	1.6	383MB1000.5	0 - 1	29,000	mg/kg
Ponds					
Arsenic	14	383PH0101.0	0.5 - 1.5	23	mg/kg
Barium	6,300	383PH0101.0	0.5 - 1.5	67,000	mg/kg
Beryllium	2	383PH0306.5	6 - 7	1,900	mg/kg
Cadmium	0.34	383PH0300.5	0 - 1	450	mg/kg
Chromium	12	383PH0101.0	0.5 - 1.5	450	mg/kg
Lead	38	383PB0300.5	0 - 1	800	mg/kg
Silver	0.48	383PH0217.5	17 - 18	5,100	mg/kg
Mercury	0.12	383PH0320.5	20 - 21	5,100	mg/kg
Diesel-Range Organics ¹	330	383PH0216.0	15.5 - 16.5	100	mg/kg
Acetone	0.025	383PH0217.5	17 - 18	54,000	mg/kg
Hexachlorobutadiene	0.0017	383PH0418.5	18 - 19	22	mg/kg
Ethylbenzene	0.0016	383PB0400.5	0 - 1	400	mg/kg
M+P-Xylene	0.0083	383PB0400.5	0 - 1	420	mg/kg
O-Xylene	0.0033	383PB0400.5	0 - 1	420	mg/kg
Benzo(A)Anthracene	0.026	383PH0216.0	15.5 - 16.5	2.1	mg/kg
Benzo(A)Pyrene	0.028	383PH0216.0	15.5 - 16.5	0.21	mg/kg
Benzo(B)Fluoranthene	0.059	383PH0216.0	15.5 - 16.5	2.1	mg/kg

Table 2-1
Maximum Reported Chemical Values for CAS 12-06-06;
Ponds 1, 2, and 3; and Drainage
(Page 3 of 4)

Contaminant of Concern	Results	Sample Number	Depth (ft bgs)	FAL	Units
Benzo(K)Fluoranthene	0.031	383PH0216.0	15.5 - 16.5	21	mg/kg
Bis(2-Ethylhexyl)Phthalate	0.33	383PH0216.0	15.5 - 16.5	120	mg/kg
Chrysene	0.066	383PH0216.0	15.5 - 16.5	210	mg/kg
Fluoranthene	0.031	383PH0216.0	15.5 - 16.5	22,000	mg/kg
Pyrene	0.063	383PH0216.0	15.5 - 16.5	29,000	mg/kg
Drainage					
Arsenic	5.3	383DH3100.5	0 - 1	23	mg/kg
Barium	6,600	383DH3200.5	0 - 1	67,000	mg/kg
Beryllium	2.1	383DH1400.5	0 - 1	1,900	mg/kg
Chromium	9.2	383DH3200.5	0 - 1	450	mg/kg
Lead	52	383DH0900.5	0 - 1	800	mg/kg
Mercury	0.083	383DH1400.5	0 - 1	5,100	mg/kg
Diesel-Range Organics ¹	68	383DH3500.5	0 - 1	100	mg/kg
Acetone	0.039	383DH0200.5	0 - 1	54,000	mg/kg
2-Butanone	0.01	383DH0200.5	0 - 1	110,000	mg/kg
Ethylbenzene	0.011	383DH0300.5	0 - 1	400	mg/kg
Hexachlorobutadiene	0.0016	383DH2700.5	0 - 1	22	mg/kg
M+P-Xylene	0.057	383DH0300.5	0 - 1	420	mg/kg
Methylene Chloride	0.004	383DH0200.5	0 - 1	21	mg/kg
O-Xylene	0.023	383DH0300.5	0 - 1	420	mg/kg
Styrene	0.0036	383DH0300.5	0 - 1	1,700	mg/kg
Toluene	0.0016	383DH0500.5	0 - 1	520	mg/kg
Benzo(A)Anthracene	0.066	383DH2600.5	0 - 1	2.1	mg/kg
Benzo(A)Pyrene	0.064	383DH2600.5	0 - 1	0.21	mg/kg
Benzo(B)Fluoranthene	0.062	383DH2600.5	0 - 1	2.1	mg/kg
Benzo(K)Fluoranthene	0.057	383DH2600.5	0 - 1	21	mg/kg
Bis(2-Ethylhexyl)Phthalate	2.4	383DH2200.5	0 - 1	120	mg/kg
Butyl Benzyl Phthalate	0.04	383DH0500.5	0 - 1	100,000	mg/kg

Table 2-1
Maximum Reported Chemical Values for CAS 12-06-06;
Ponds 1, 2, and 3; and Drainage
(Page 4 of 4)

Contaminant of Concern	Results	Sample Number	Depth (ft bgs)	FAL	Units
Chrysene	0.1	383DH2200.5	0 - 1	210	mg/kg
Dimethyl Phthalate	0.014	383DH2200.5	0 - 1	100,000	mg/kg
Di-N-Octyl Phthalate	0.059	383DH2200.5	0 - 1	25,000	mg/kg
Fluoranthene	0.12	383DH2600.5	0 - 1	22,000	mg/kg
Pyrene	0.19	383DH2600.5	0 - 1	29,000	mg/kg

RR1 - Indicates the sample was re-analyzed at a higher dilution due to higher-than-expected results.

ft bgs - Feet below ground surface

¹ Diesel-range organics (i.e., petroleum hydrocarbons) level is defined by *Nevada Administrative Code* 445.2272 (NAC, 2005b).

² Tier 2 FAL

The radionuclide americium (Am)-241 was detected at concentrations above the PAL (7.62 picocuries per gram [pCi/g]) in three of the 115 environmental samples analyzed. Cesium (Cs)-137 was detected at concentrations above the PAL (7.3 pCi/g) in 54 of the 115 environmental samples analyzed. Plutonium-238 was detected at concentrations above the PAL (7.78 pCi/g) in one of the 115 environmental samples analyzed. Plutonium-239 was detected at concentrations above the PAL (7.62 pCi/g) in four of the 115 environmental samples analyzed. Americium-241, Cs-137, Pu-238, and Pu-239 were moved to a Tier 2 evaluation. The Tier 2 evaluation was completed using the Residual Radioactive (RESRAD) model and computer code to determine the site-specific FALs for Am-241, Cs-137, Pu-238, and Pu-239. Sites contaminated with two or more radionuclides are evaluated using a sum-of-fractions method to determine the total exposure from the radionuclides present. The RESRAD methods and results are explained in detail in [Attachment A](#) of [Appendix D](#) in this report. The Am-241, Cs-137, and Pu-238 all exceeded FALs in three samples from the Muckpile. The Pu-239 exceeded its FAL in four samples from the Muckpile. No other radionuclide exceeded PALs, so the PALs for those radionuclides are identified as the FALs. The maximum concentration of each detected radiological contaminant at this CAS is listed in [Table 2-2](#).

Table 2-2
Maximum Reported Radiological Values for CAS 12-06-06;
Ponds 1, 2, and 3; and Drainage
(Page 1 of 2)

Contaminant of Concern	Results	Sample Number	Depth (ft bgs)	FAL	Units
Muckpile					
Actinium-228	2.89	383MB0400.5	0 - 1	5	pCi/g
Americium-241	28.8	383MB0543.5	43 - 44	7.32 ¹	pCi/g
Bismuth-214	2.08	383MB0900.5	0 - 1	5	pCi/g
Cesium-137	1,060	383MB0543.5	43 - 44	269.56 ¹	pCi/g
Europium-152	2.64	383MB0543.5	43 - 44	5.7	pCi/g
Lead-212	3.37	383MB0900.5	0 - 1	5	pCi/g
Lead-214	2.08	383MB0900.5	0 - 1	5	pCi/g
Thallium-208	1.02	383MB0900.5	0 - 1	5	pCi/g
Strontium-90	54	383MH0559.5	59 - 60	503	pCi/g
Plutonium-238	15.6	383MB0543.5	43 - 44	3.97 ¹	pCi/g
Plutonium-239	84	383MB0543.5	43 - 44	21.36 ¹	pCi/g
Ponds					
Actinium-228	2.4	383PH0116.5	16 - 17	5	pCi/g
Bismuth-214	1.72	383PH0306.5	6 - 7	5	pCi/g
Cesium-137	142	383PH0216.0	16 - 17	269.56 ¹	pCi/g
Lead-212	2.76	383PH0320.5	20 - 21	5	pCi/g
Lead-214	1.81	383PH0408.0X	7.5 - 8.5	5	pCi/g
Thallium-208	1.05	383PH0116.5	16 - 17	5	pCi/g
Strontium-90	3.62	383PH0300.5X	0 - 1	503	pCi/g
Plutonium-238	0.74	383PH0216.0	15.5 - 16.5	7.78	pCi/g
Plutonium-239	5.37	383PH0216.0	15.5 - 16.5	7.62	pCi/g

Table 2-2
Maximum Reported Radiological Values for CAS 12-06-06;
Ponds 1, 2, and 3; and Drainage
 (Page 2 of 2)

Contaminant of Concern	Results	Sample Number	Depth (ft bgs)	FAL	Units
Drainage					
Actinium-228	2.26	383DH0200.5	0 - 1	5	pCi/g
Aluminum-26	0.105	383DH1600.5	0 - 1	2.32	pCi/g
Americium-241	1.88	383DH0200.5	0 - 1	7.62	pCi/g
Bismuth-214	1.48	383DH1400.5	0 - 1	5	pCi/g
Cesium-137	78.1	383DH2100.5	0 - 1	269.56 ¹	pCi/g
Lead-212	2.54	383DH0600.5	0 - 1	5	pCi/g
Lead-214	1.68	383DH1400.5	0 - 1	5	pCi/g
Thorium-234	2.4	383DH0500.5	0 - 1	5	pCi/g
Thallium-208	0.87	383DH1400.5	0 - 1	5	pCi/g
Strontium-90	1.88	383DH0100.5	0 - 1	503	pCi/g
Plutonium-238	0.73	383DH0100.5	0 - 1	7.78	pCi/g
Plutonium-239	4.21	383DH1400.5	0 - 1	7.62	pCi/g

¹ Tier 2 FAL

These results show that there is no vertical migration into the native material and only limited migration in storm runoff. The runoff is constrained by the drainage and ponds.

2.2.1.2 Oil Spill (CAS 12-25-02)

During the CAI, TPH-DRO was found above the PAL of 100 mg/kg in five soil samples, so it was moved into a Tier 2 evaluation as described in the previous section. Of the hazardous constituents of TPH-DRO, benzo(a)anthracene exceeded the PAL (2.1 mg/kg) in two of the samples, and benzo(a)pyrene exceeded the PAL (0.21 mg/kg) in three of the samples. None of the other hazardous constituents of TPH-DRO exceeded the PALs; therefore, for those constituents, the PALs are identified as the FALs.

For the chemical constituents, other than the hazardous constituents of TPH-DRO reported above, benzo(a)pyrene (PAL 0.21 mg/kg), benzo(b)fluoranthene (PAL 2.1 mg/kg), dibenzo(a,h)anthracene (PAL 0.21 mg/kg), and ideno(1,2,3-cd)pyrene (PAL 2.1 mg/kg) exceeded their PALs, so they were moved to a Tier 2 analysis and the ORNL website was used to calculate the site-specific

FALs (ORNL, 2004). For all other constituents, the PALs as identified in the CAIP (DTRA, 2003) are identified as the FALs. The Tier 2 methodology results are presented and explained in Appendix D of this report. Benzo(a)pyrene exceeded its FAL in one sample; no other COCs exceeded their respective FALs. The maximum concentration of each detected chemical contaminant at this CAS is listed in [Table 2-3](#).

Table 2-3
Maximum Reported Chemical Values for CAS 12-25-02
(Page 1 of 2)

Contaminant of Concern	Results	Sample Number	Depth (ft bgs)	FAL	Units
Oil Spill					
Arsenic	7.1	383OB0800.5	0 - 1	23	mg/kg
Barium	300	383OB0400.5	0 - 11	67,000	mg/kg
Beryllium	1.2	383OB0500.5	0 - 1	1,900	mg/kg
Cadmium	1.4	383OB0200.5	0 - 1	450	mg/kg
Chromium	10	383OB0700.5	0 - 1	450	mg/kg
Lead	31	383OB0700.5	0 - 1	800	mg/kg
Selenium	1.2	383OB0800.5	0 - 1	310	mg/kg
Diesel-Range Organics ¹	3,400	383OB0100.5	0 - 1	100	mg/kg
Acetone	0.072	383OB0100.5	0 - 1	54,000	mg/kg
Acenaphthene	0.093	383OB0800.5	0 - 1	29,000	mg/kg
Anthracene	0.47	383OB0800.5	0 - 1	100,000	mg/kg
Benzo(A)Anthracene	17	383OB0800.5	0 - 1	147 ²	mg/kg
Benzo(A)Pyrene	20	383OB0800.5RR1	0 - 1	15 ²	mg/kg
Benzo(B)Fluoranthene	37	383OB0800.5	0 - 1	150 ²	mg/kg
Benzo(K)Fluoranthene	10	383OB0800.5	0 - 1	21	mg/kg
Bis(2-Ethylhexyl)Phthalate	4	383OB0800.5	0 - 1	120	mg/kg
2 Butanone	0.017	383OB0100.5	0 - 1	110,000	mg/kg
Carbazole	0.79	383OB0800.5	0 - 1	86	mg/kg
Chrysene	21	383OB0800.5	0 - 1	210	mg/kg

Table 2-3
Maximum Reported Chemical Values for CAS 12-25-02
(Page 2 of 2)

Contaminant of Concern	Results	Sample Number	Depth (ft bgs)	FAL	Units
Dibenzo(A,H)Anthracene	10	383OB0800.5	0 - 1	15 ²	mg/kg
Fluoranthene	10	383OB0800.5	0 - 1	22,000	mg/kg
Fluorene	0.068	383OB0800.5	0 - 1	26,000	mg/kg
Ideno(1,2,3-Cd)Pyrene	22	383OB0800.5	0 - 1	150 ²	mg/kg
Naphthalene	0.056	383OB0800.5	0 - 1	190	mg/kg
Pyrene	89	383OB0800.5	0 - 1	29,000	mg/kg

RR1 - Indicates the sample was re-analyzed at a higher dilution due to higher-than-expected results.
ft bgs - Feet below ground surface

¹ Diesel-range organics (i.e., petroleum hydrocarbons) level is defined by *Nevada Administrative Code* 445.2272 (NAC, 2005b).

² Tier 2 FAL

For the radionuclides, only Cs-137 was detected at concentrations above the PAL (7.3 pCi/g) in two of the eight environmental samples analyzed, so it was moved to a Tier 2 evaluation. No other radionuclides exceeded their PALs as defined in the CAIP (DTRA, 2003), so the PALs for those radionuclides are identified as the FALs. The Tier 2 evaluation was completed by using the RESRAD model and computer code to determine the site-specific FALs for Cs-137 (Appendix D). None of the radionuclides exceeded their respective FALs in this CAS. The maximum concentration of each detected radiological contaminant at this CAS is listed in [Table 2-4](#).

2.2.1.3 Radioactive Material (CAS 12-28-02)

During the CAI, TPH-DRO was not found above the PAL of 100 mg/kg; therefore, the PAL is identified as the FAL for TPH-DRO.

For the chemical constituents, only benzo(a)pyrene was detected in one sample that exceeded the PAL (0.21 mg/kg), so it was moved to a Tier 2 analysis as described above. Benzo(a)pyrene did not exceed the calculated FAL (Appendix D). The maximum concentration of each detected chemical contaminant at this CAS and its FAL are listed in [Table 2-5](#).

Table 2-4
Maximum Reported Radiological Values for CAS 12-25-02

Contaminant of Concern	Results	Sample Number	Depth (ft bgs)	FAL	Units
Oil Spill					
Actinium-228	2.21	383OB0100.5	0 - 1	5	pCi/g
Bismuth-214	1.1	383OB0800.5	0 - 1	5	pCi/g
Cesium-137	20.5	383OB0700.5	0 - 1	275 ¹	pCi/g
Lead-212	3.1	383OB0500.5	0 - 1	5	pCi/g
Lead-214	1.06	383OB0600.5	0 - 1	5	pCi/g
Thallium-208	0.97	383OB0500.5	0 - 1	5	pCi/g
Plutonium-239	1.04	383OB0800.5	0 - 1	7.62	pCi/g

¹Tier 2 FAL

Table 2-5
Maximum Reported Chemical Values for CAS 12-28-02
(Page 1 of 2)

Contaminant of Concern	Results	Sample Number	Depth (ft bgs)	FAL	Units
Radioactive Material					
Arsenic	7.1	383RB0200.5	0 - 1	23	mg/kg
Barium	260	383RB0300.5	0 - 1	67,000	mg/kg
Beryllium	1.7	383RB0100.5	0 - 1	1,900	mg/kg
Cadmium	0.57	383RB0300.5	0 - 1	450	mg/kg
Lead	61	383RB0300.5	0 - 1	800	mg/kg
Mercury	0.16	383RB0100.5	0 - 1	5,100	mg/kg
Diesel-Range Organics ¹	15	383RB0400.5	0 - 1	100	mg/kg
Benzo(A)Anthracene	0.17	383RB0300.5	0 - 1	2.1	mg/kg
Benzo(A)Pyrene	0.23	383RB0400.5	0 - 1	15 ²	mg/kg
Benzo(B)Fluoranthene	0.62	383RB0400.5	0 - 1	2.1	mg/kg
Benzo(K)Fluoranthene	0.23	383RB0300.5	0 - 1	21	mg/kg
Bis(2-Ethylhexyl)Phthalate	1.2	383RB0300.5	0 - 1	120	mg/kg

Table 2-5
Maximum Reported Chemical Values for CAS 12-28-02
(Page 2 of 2)

Contaminant of Concern	Results	Sample Number	Depth (ft bgs)	FAL	Units
Butyl Benzyl Phthalate	0.78	383RB0100.5	0 - 1	100,000	mg/kg
Carbazole	0.023	383RB0400.5	0 - 1	86	mg/kg
Chrysene	0.48	383RB0400.5	0 - 1	210	mg/kg
Dibenzo(A,H)Anthracene	0.027	383RB0400.5	0 - 1	21	mg/kg
Di-N-Butyl Phthalate	4.5	383RB0100.5	0 - 1	62,000	mg/kg
Fluoranthene	0.51	383RB0400.5	0 - 1	22,000	mg/kg
Ideno(1,2,3-Cd)Pyrene	0.08	383RB0400.5	0 - 1	2.1	mg/kg
Naphthalene	0.018	383RB0400.5	0 - 1	190	mg/kg
Pyrene	0.43	383RB0400.5	0 - 1	29,000	mg/kg

ft bgs - Feet below ground surface

¹ Diesel-range organics (i.e., petroleum hydrocarbons) level is defined by *Nevada Administrative Code* 445.2272 (NAC, 2005b).

² Tier 2 FAL

For the radionuclides, Cs-137 and thorium (Th)-234 were detected at concentrations above their PALs (7.3 and 5 pCi/g, respectively) in one of the four environmental samples analyzed. Plutonium-238 was detected at concentrations above the PAL (7.78 pCi/g) in one of the 115 environmental samples analyzed. Plutonium-239 was detected at concentrations above the PAL (7.62 pCi/g) in four of the 115 environmental samples analyzed. Only Cs-137, Pu-238, and Pu-239 were moved to a Tier 2 evaluation. The half life of Th-234 is too short (24 days) to be considered in the Tier 2 evaluation. No other radionuclides exceeded their PALs, so the PALs for those radionuclides are identified as the FALs (Appendix D). Based on the PAL and FAL comparisons, none of the radionuclides exceed the FALs. The maximum concentration of each detected radiological contaminant at this CAS is listed in [Table 2-6](#).

Table 2-6
Maximum Reported Radiological Values for CAS 12-28-02

Contaminant of Concern	Results	Sample Number	Depth (ft bgs)	FAL	Units
Radioactive Material					
Actinium-228	2.9	383RB0100.5	0 - 1	5	pCi/g
Bismuth-212	3.2	383RB0100.5	0 - 1	5	pCi/g
Bismuth-214	1.12	383RB0200.5	0 - 1	5	pCi/g
Cesium-137	114	383RB0100.5	0 - 1	275.2 ¹	pCi/g
Lead-212	2.96	383RB0100.5	0 - 1	5	pCi/g
Lead-214	1.04	383RB0400.5	0 - 1	5	pCi/g
Thorium-227	4.1	383RB0100.5	0 - 1	5	pCi/g
Thorium-234	7.2	383RB0100.5	0 - 1	5	pCi/g
Thallium-208	0.85	383RB0100.5	0 - 1	5	pCi/g
Plutonium-238	0.232	383RB0400.5	0 - 1	7.78	pCi/g
Plutonium-239	2.09	383RB0200.5	0 - 1	7.62	pCi/g

¹Tier 2 FAL

2.2.2 Data Assessment Summary

The Data Quality Assessment (DQA) is presented in Appendix C and includes an evaluation of the DQIs to determine the degree of acceptability and usability of the reported data in the decision-making process. The DQO process ensures that the right type, quality, and quantity of data will be available to support the resolution of those decisions at an appropriate level of confidence. Using both the DQO and DQA processes ensures that DQO decisions are sound and defensible.

The DQA process as presented in Appendix C is comprised of the following steps:

- Step 1 - Review DQOs and Sampling Design.
- Step 2 - Conduct a Preliminary Data Review.
- Step 3 - Select the Test.
- Step 4 - Verify the Assumptions.
- Step 5 - Draw Conclusions from the Data.

Sample locations that support the presence and/or extent of contamination at each CAS are shown in [Appendix A](#). Based on the results of the DQA presented in Appendix C, the DQO requirements have been met, and the close in place corrective action alternative was selected as the closure alternative at CAU 383, Area 12 E-Tunnel Sites. The DQA also determined that information generated during the investigation supports the CSM assumptions, and the data collected support the intended use in the decision-making process.

2.3 Justification for No Further Action

No further action is justified based on an evaluation of risk (see Appendix D) to ensure protection of the public and the environment in accordance with *Nevada Administrative Code* (NAC) 445A (NAC, 2005a), feasibility, and cost effectiveness. The corrective action was determined from DQO decision statements based on a comparison of the analyte concentrations detected in CAI soil samples to the FALs defined in [Section 2.3.1](#). Because the extent of the COCs is limited and the CAI demonstrated that there has been no vertical migration and only limited lateral migration of COCs in storm runoff, the corrective action to close in place with use restrictions is justified at all three CASs; the drainage; and Ponds 1, 2, and 3. Appendix D presents an evaluation of risk associated with the recommended closure alternative.

2.3.1 Final Action Levels

The CAU 383 FALs are risk-based cleanup goals that, if met, will ensure that each release site will not pose an unacceptable risk to human health and the environment under the identified use scenario, and that conditions at each site are in compliance with all applicable laws and regulations. The process described in this section to define and determine the FALs conforms with NAC Section 445A.227 (NAC, 2005b), which lists the requirements for sites with soil contamination. For the evaluation of corrective actions, NAC Section 445A.22705 (NAC, 2005c) requires the use of ASTM Method E 1739-95 to “conduct an evaluation of the site, based on the risk it poses to public health and the environment, to determine the necessary remediation standards (i.e., FALs) or to establish that corrective action is not necessary.”

The ASTM procedure (ASTM, 1995) defines three tiers (or levels) of evaluation involving increasingly sophisticated analyses as follows.

- ***Tier 1 Evaluation*** - Sample results from source areas (highest concentrations) are compared to action levels based on generic (non-site-specific) conditions (i.e., the PALs established in the CAIP). The FALs may then be established as the Tier 1 action levels, or the FALs may be calculated using a Tier 2 evaluation.
- ***Tier 2 Evaluation*** - Conducted by calculating Tier 2 site-specific target levels (SSTLs) using site-specific information as inputs to the same or similar methodology used to calculate Tier 1 action levels. The Tier 2 SSTLs are then compared to individual sample results from reasonable points of exposure (as opposed to the source areas as is done in Tier 1) on a point-by-point basis. Total TPH concentrations are not used for risk-based decisions under Tier 2 or Tier 3. Rather, the individual hazardous constituents in TPH will be compared to their SSTLs.

Alternatively, the Tier 2 risk-based corrective action process SSTLs may be compared to the predicted concentration or activity of the contaminant at the point of exposure based on attenuation from the source using relatively simplistic mathematical models. Points of exposure are defined as those locations at which an individual or population may come in contact with a COC originating from a CAS. If a Tier 2 evaluation is conducted, the calculations used to derive the SSTLs and the contaminant attenuation calculations will be provided as an appendix to the investigation report. If remediation to Tier 2 SSTLs is not practical, a Tier 3 evaluation may be conducted.

- ***Tier 3 Evaluation*** - Conducted by calculating Tier 3 SSTLs on the basis of more sophisticated risk analyses using methodologies described in ASTM Method E 1739-95 that consider site-, pathway-, and receptor-specific parameters. Tier 3 evaluation is much more complex than Tiers 1 and 2, because it may include additional site characterization, probabilistic evaluations, and sophisticated chemical fate/transport models. The Tier 3 SSTLs are then compared to the upper 95 percent confidence limit of the mean of sample results from reasonable points of exposure (as opposed to individual sample results as is done in Tier 2). Contaminant concentrations exceeding

Tier 3 SSTLs require corrective action. If a Tier 3 evaluation is conducted, the calculations used to derive the SSTLs and the upper confidence limit of the means will be provided as an appendix to the investigation report.

A Tier 1 evaluation was conducted for all COPCs to determine whether contaminant levels satisfy the criteria for a quick regulatory closure or warrant a more site-specific assessment. This was accomplished by comparing individual source area contaminant concentration results to the Tier 1 actions levels (the PALs established in the CAIP).

The constituents detected at CAU 383 that exceeded Tier 1 action levels were:

- TPH-DRO at CAS 12-06-06, the drainage, the ponds, and CAS 12-25-02
- Benzo(a)pyrene at CAS 12-06-06, CAS 12-25-02, and CAS 12-28-02
- Benzo(a)anthracene at CAS 12-25-02
- Benzo(b)fluoranthene at CAS 12-25-02
- Dibenzo(a,h)anthracene at CAS 12-25-02
- Ideno(1,2,3-cd)pyrene at CAS 12-25-02
- Am-241 at CAS 12-06-06
- Cs-137 at CAS 12-06-06, the drainage, the ponds, CAS 12-25-02, and CAS 12-28-02
- Pu-238 at CAS 12-06-06
- Pu-239 at CAS 12-06-06

The concentration of all constituents not listed above were below Tier 1 action levels, and the corresponding PALs were established as the Tier 1 FALs. All of the constituents at CAU 383 that exceeded Tier 1 action levels were moved to a Tier 2 evaluation.

The Tier 2 evaluation of TPH-DRO compared the concentrations of the individual hazardous constituents of TPH-DRO to the Tier 1 action levels in each sample that exceeded for TPH-DRO. For the constituent concentrations that exceeded the Tier 1 action levels, a site-specific action level was calculated using site-specific inputs to the risk equations in the ORNL website (ORNL, 2004). These calculated concentrations were then established as the FALs for the hazardous constituents in TPH-DRO at CAU 383.

For the non-TPH chemicals that exceeded the PALs, a FAL was calculated using the Tier 2 evaluation process. The calculated concentrations were then established as the FALs for those

constituents at CAU 383 ([Appendix D](#)). The Tier 2 calculated FALs are presented in [Table 2-7](#). Additional details of the Tier 2 evaluation is provided in [Appendix D](#).

The Tier 2 evaluation for the radionuclides was conducted by entering site-specific radionuclide information and physical characteristics of the site into the RESRAD program to calculate the site-specific action levels. This calculated the site-specific activities needed ensure the collective exposures from individual radionuclides do not exceed the 25-millirem-per-year annual dose constraint.

Although all detected radionuclides as a CAS are used in the sum-of-fractions calculation, and a unique Tier 2 action level is developed for all radionuclides, only the five radionuclides that initially exceeded Tier 1 levels have a Tier 2-based FAL. The CAS-specific FALs established for these radionuclides are the SSTLs listed in [Table D.1-7](#). These calculated activities were established as the FALs for each radionuclide at each CAS that exceeded a Tier 1 action level. The Tier 2 calculated FALs are presented in [Table 2-7](#). Additional details of the Tier 2 evaluation are provided in [Appendix D](#).

**Table 2-7
Final Action Levels**

COPCs	Tier 1 FALs	Tier 2 FALs	Tier 3 FALs
VOCs	PALs	N/A	N/A
SVOCs	PALs except as listed under Tier 2	Benzo(a)anthracene 147 mg/kg Benzo(a)pyrene 15 mg/kg Benzo(b)fluoranthene 150 mg/kg Benzo(k)fluoranthene 1,500 mg/kg Dibenzo(a,h)anthracene 15 mg/kg Ideno(1,2,3-cd)pyrene 150 mg/kg	N/A
RCRA Metals + Beryllium	PALs	N/A	N/A
TPH-DRO	PALs	PALs except for benzo(a)pyrene 15 mg/kg	N/A
Radionuclides	PALs except as listed under Tier 2	<p>CAS 12-06-06</p> <p><u>Am-241 7.32 pCi/g</u> <u>Cs-137 269.56 pCi/g</u></p> <p><u>Pu-238 3.97 pCi/g</u> <u>Pu-239 21.36 pCi/g</u></p> <p>CAS 12-25-02</p> <p><u>Cs-137 275 pCi/g</u> <u>Pu-239 2,150 pCi/g</u></p> <p>CAS 12-28-02</p> <p><u>Cs-137 275.2 pCi/g</u> <u>Pu-238 2,370 pCi/g</u></p> <p><u>Pu-239 2,152 pCi/g</u></p>	N/A

N/A = Not applicable

3.0 Recommendations

The data generated by the CAI show that the FALs were exceeded for radionuclides in one surface sample and three subsurface samples in CAS 12-06-06 (Muckpile), and for benzo(a)pyrene in one surface sample at CAS 12-25-02 (Oil Spill). Because FALs were exceeded at CAU 383, a use restriction is recommended to be put in place that will prevent exposure of NTS workers and the public to the COCs. On a conservative basis, CASs 12-06-06, CAS 12-25-02, and CAS 12-28-02 will be use restricted from the surface to a depth of 150 ft bgs, and the drainage and Ponds 1, 2, and 3 will be use restricted from the surface to a depth of 50 ft bgs. The future use of CAU 383 will be restricted from any activity that will alter or modify the containment controls unless concurrence is obtained from the Nevada Division of Environmental Protection (NDEP). Because removal of the contaminants within the Muckpile is not feasible, the close in place with administrative controls corrective action alternative is appropriate. It will prevent inadvertent contact with the COCs, and meets all applicable state and federal regulations for closure of the site.

An annual post-closure inspection is associated with the use restriction to certify that markers and postings are in place, intact, and readable. Results of these inspections will be provided in the annual Post Closure Inspection and Monitoring Report.

In conclusion, DTRA and NNSA/NSO request that NDEP issue a Notice of Completion for this CAU and approval to move the CAU from Appendix III to Appendix IV of the FFACO.

4.0 References

ASTM, see American Society for Testing and Materials.

American Society for Testing and Materials. 1995. *Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites/American Society for Testing and Materials*, ASTM E 1739-95 (Reapproved 2002). Philadelphia, PA.

DTRA, see Defense Threat Reduction Agency.

Defense Threat Reduction Agency. 2003. *Corrective Action Investigation Plan for Corrective Action Unit 383: Area 12 E-Tunnel Sites, Nevada Test Site*, Rev. 0. Prepared by SNJV. Las Vegas, NV.

FFACO, see *Federal Facility Agreement and Consent Order*.

Federal Facility Agreement and Consent Order. 1996 (as amended). Agreed to by the State of Nevada, the U.S. Department of Energy, and the U.S. Department of Defense.

NAC, see *Nevada Administrative Code*.

NNSA/NV, see U.S. Department of Energy, National Nuclear Security Administration Nevada Operations Office.

Nevada Administrative Code. 2005a. NAC 445A, "Water Controls." Carson City, NV.

Nevada Administrative Code. 2005b. NAC 445A.2272, "Contamination of Soil: Establishment of Action Levels." Carson City, NV.

Nevada Administrative Code. 2005c. NAC 445A.22705, "Contamination of Soil: Evaluation of Site by Owner or Operator; Review of Evaluation by Division." Carson City, NV.

ORNL, see Oak Ridge National Laboratory

Oak Ridge National Laboratory. 2004. *Risk Assessment Information System*. As accessed at http://risk.lsd.ornl.gov/cgi-bin/prg/PRG_search on 25 April 2006.

SNJV, see Stoller Navarro Joint Venture.

Stoller-Navarro Joint Venture. 2003. *SNJV Site-Specific Health and Safety Plan, DTRA CAU 383 E-Tunnel Muckpile, Nevada Test Site*, Rev. 0. Las Vegas, NV.

U.S. Department of Energy, National Nuclear Security Administration Nevada Operations Office.
2002. *Industrial Sites Quality Assurance Project Plan, Nevada Test Site, Nevada*,
DOE/NV--372, Rev. 3. Las Vegas, NV.

Appendix A

Corrective Action Investigation Results

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List of Acronyms and Abbreviations

Ac	Actinium
Al	Aluminum
Am	Americium
Bi	Bismuth
BN	Bechtel Nevada
CADD	Corrective Action Decision Document
CAI	Corrective Action Investigation
CAIP	Corrective Action Investigation Plan
CAS	Corrective Action Site
CAU	Corrective Action Unit
COPC	Contaminant of potential concern
cps	Counts per second
Cs	Cesium
DLAPS	Dual Large-Area Plastic Scintillation Detector
DOE	U.S. Department of Energy
DRO	Diesel-range organics
DTRA	Defense Threat Reduction Agency
Eu	Europium
EZ	Exclusion Zone
FADL	Field Activity Daily Log
FFACO	<i>Federal Facility Agreement and Consent Order</i>
FID	Flame-ionization detector
ft	Foot
GPS	Global Positioning System
H&S	Health and Safety
HWAA	Hazardous waste accumulation area
IDW	Investigation-derived waste
K	Potassium
mg/kg	Milligrams per kilogram
mg/L	Milligrams per liter

List of Acronyms and Abbreviations (Continued)

ND	Not detected
NNSA/NSO	U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office
NTS	Nevada Test Site
Pb	Lead
pCi/g	Picocuries per gram
pCi/L	Picocuries per liter
PPE	Personal protective equipment
Pu	Plutonium
QA	Quality assurance
QC	Quality control
RCRA	<i>Resource Conservation and Recovery Act</i>
REOP	Real Estate/Operations Permit
SAPS	Small Area Plastic Scintillation Detector
SCL	Sample Collection Log
SNJV	Stoller-Navarro Joint Venture
Sr	Strontium
SS	Site Supervisor
SSHASP	Site-Specific Health and Safety Plan
SSO	Site Safety Officer
SVOC	Semivolatile organic compound
TD	Total depth
Th	Thorium
Tl	Thallium
TID	Tamper-indicating device
TPH	Total petroleum hydrocarbons
VOC	Volatile organic compound
Fg/kg	Micrograms per kilogram
Fg/L	Micrograms per liter

Executive Summary

The Corrective Action Investigation (CAI) of the E-Tunnel Sites and drainage, identified under the *Federal Facility Agreement and Consent Order* (FFACO) (1996) classification as Corrective Action Unit (CAU) 383, Area 12 E-Tunnel Sites, consists of three Corrective Action Sites (CASs): 12-06-06, Muckpile; 12-25-02, Oil Spill; and 12-28-02, Radioactive Material. The following activities were completed during the CAI: a drive-over radiological survey, a walk-over radiological survey, roto sonic drilling and soil sampling, and hand soil sampling.

In September 2003, drive-over and walk-over radiological surveys of the E-Tunnel Sites and the drainage below the Muckpile, including the ponds were completed. These surveys identified surface and near-surface areas with elevated readings on the Muckpile, in the drainage and ponds, and near the blower pad.

The next stage of the investigation consisted of roto sonic drilling and hand sampling to collect soil samples from within and beneath the Muckpile and ponds, the drainage, the radioactive material area, and the oil spill (blower pad). This was conducted between May 19 and June 24, 2004. Ninety locations were drilled or hand sampled to characterize CAU 383. A total of 1,129.5 feet (ft) was drilled in 39 boreholes ranging from 1.5 to 91.5 ft deep. Fifty-one locations were sampled by hand. One to three samples were collected from 89 locations, and one borehole was not sampled. During the characterization, 129 environmental samples were collected. These included 40 muck samples, eight oil spill samples, four contamination area samples, 37 samples from the drainage, 10 pond sediment samples, and 30 native material samples. Seven duplicate and six lab soil samples were collected for quality control (QC) purposes. Thirty-seven QC water samples were collected (seven equipment rinsate samples, seven field blank samples, one source blank, and 22 trip blanks). All soil and water samples were sent to Paragon Analytics, Inc., for analysis. Analyses performed included volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), total petroleum hydrocarbons (TPH)-diesel-range organics (DRO), total *Resource Conservation and Recovery Act* (RCRA) metals, beryllium, and radionuclides (gamma spec, isotopic plutonium and strontium-90). In addition, three background, five preliminary, one duplicate, and one lab QC soil samples were collected in February and March 2004. These soil samples were also sent to Paragon Analytics, Inc., for analysis.

Varying amounts of VOCs, SVOCs, TPH-DRO, beryllium, total RCRA metals, and radionuclides were detected in the muck and/or native soil samples from all three CASSs included in this investigation.

During the CAI, seven drums of investigation-derived waste were accumulated: four drums of rinsate from decontamination activities, two drums of hydrocarbon-contaminated plastic, and one drum of personal protective equipment. The environmental sample analytical results were used to make the waste determination that none of the drums were considered to be hazardous or radioactive. All of the drums were disposed of as sanitary waste except for the two drums of hydrocarbon-contaminated plastic, which were sent to the hydrocarbon landfill.

A.1.0 Introduction

The Corrective Action Investigation (CAI) of the Area 12 E-Tunnel Sites and associated drainage was conducted in accordance with the *Federal Facility Agreement and Consent Order* (FFACO) (1996), that was agreed to by the U.S. Department of Defense, Defense Special Weapons Agency (predecessor to the Defense Threat Reduction Agency [DTRA]); the U.S. Department of Energy (DOE); and the Nevada Division of Environmental Protection. The investigation was controlled and guided by the Corrective Action Unit (CAU) 383 Corrective Action Investigation Plan (CAIP) (DTRA, 2003); Field Instructions (DTRA, 2004), which referenced the operational checklists; and the site-specific health and safety plan (SSHASP) (SNJV, 2003). The E-Tunnel Muckpile and associated sites are identified under FFAO classification as CAU 383, Area 12 E-Tunnel Sites. Corrective Action Unit 383 is a joint DTRA and DOE, National Nuclear Security Administration Nevada Site Office (NNSA/NSO) site. The CAU consists of three Corrective Action Sites (CASs): 12-06-06, Muckpile; 12-25-02, Oil Spill; and 12-28-02, Radioactive Material. In addition to these sites, the drainage between the Muckpile and the first pond, and Ponds 1, 2, and 3 were sampled. This report presents a summary of the field activities and the data collected during the field effort.

[Section 1.0](#) is the introduction, which includes a description of the purpose and scope of the project. [Section 2.0](#) is the project description. [Section 3.0](#) details the Area 12 E-Tunnel Sites investigation and provides a description of the sample collection activities and locations. [Section 4.0](#) is a summary of the sample analytical results. [Section 5.0](#) provides a description of the waste management activities. [Section 6.0](#) covers the health and safety aspects of the project. [Section 7.0](#) discusses the lessons learned during the project, and [Section 8.0](#) lists the references. [Attachments A](#) through [C](#) provide copies of the field and analytical data.

A.1.1 Purpose

The purpose of the Area 12 E-Tunnel Sites CAI was to determine whether the Area 12 E-Tunnel Sites and/or the underlying soils have been impacted by the contaminants of concern (COCs). The data collected during the field effort, which are presented in this report, enabled DTRA and NNSA/NSO to make informed decisions about the future use or closure of the site. The

Muckpile primarily consists of mining debris (rock) generated during tunnel excavation and construction in support of nuclear weapons effects testing. The investigation was conducted to achieve the following goals:

- Determine whether identified COPCs (both chemical and radiological) are present at the surface, within, or beneath the Muckpile, the Oil Spill, the Radioactive Material, the drainage, and/or the first three ponds at concentrations exceeding FALs.
- Provide sufficient information and data to develop appropriate corrective action strategies for the Muckpile and associated sites, and support the selected corrective action alternative.

A.1.2 Scope of Work

The scope of the Area 12 E-Tunnel Muckpile investigation included the following:

- Conducted walk-over and drive-over radiological surveys using field-screening instruments to locate areas with elevated radiological levels.
- Collected random and biased Muckpile and native soil samples using the dry roto sonic drilling method or hand tools.
- Collected random and biased soil samples from the drainage below the Muckpile and the ponds using the dry roto sonic drilling method or hand tools.
- Conducted volatile organic compound (VOC) and radiological field screening for health and safety monitoring and to identify the presence or absence of COPCs.
- Logged the drill cores to describe soil characteristics and identify the muck/native material contact.
- Conducted laboratory analysis of the environmental and quality control (QC) samples to determine the presence or absence of COPCs.
- Collected three background samples from undisturbed areas around the Muckpile.

The sampling was a combination of simple random and judgmental (biased) sampling. The random sampling locations on the Muckpile and in the drainage were selected based on a simple random sampling method as described in Chapter 4 of *Statistical Methods for Environmental Pollution Monitoring* (Gilbert, 1987). The random sampling locations in the first pond were

selected based on a stratified random sampling method as described in Chapter 5 of the same reference (Gilbert, 1987). The biased samples were collected from locations where elevated radiological levels were identified by the drive-over and/or walk-over surveys, process knowledge indicates surface operations could have contributed COPCs to the environment, or visual evidence indicates impacted soils.

A.2.0 Project Description

The Area 12 E-Tunnel Sites, CAU 383, is located approximately 42 miles north of Mercury in Area 12 of the Nevada Test Site (NTS) ([Figure A.2-1](#)). Corrective Action Unit 383 ([Figure A.2-2](#)) consists of three CASs: 12-06-06, Muckpile; 12-25-02, Oil Spill; and 12-28-02, Radioactive Material. The E-Tunnel was used for nine nuclear weapons effects tests between 1958 and 1977. The E-Tunnel Muckpile (CAS 12-06-06) consists of an estimated 355,000 cubic yards of material mined out of the tunnel. The surface elevation at the top of the Muckpile is about 6,120 feet (ft) above mean sea level. The Muckpile was deposited in an easterly trend in front of the tunnel portals. The muckpile is approximately 200 ft across and 1,200 ft long in an east-west direction. The thickness of the Muckpile ranges from less than 5 ft at the west end to approximately 100 ft at the northeast side. The drainage that was included in this investigation trends easterly along the base of the Muckpile.

Corrective Action Site 12-28-02 (Radioactive Material) is located at the E-Tunnel Main portal and is part of the Muckpile.

Corrective Action Site 12-25-02 (Oil Spill) is located on the blower pad, which is on a bench approximately 100 ft above the E-Tunnel south portal. The pad was constructed in the hillside and is about 100 ft long north to south and 50 ft wide. Fill on the pad varies in thickness from less than 1 ft next to the slope to about 10 ft on the north edge of the pad.

A.2.1 Slope Stability

Given the site conditions and proposed operating parameters, a slope stability analysis was prepared for the E-Tunnel Muckpile. The work restriction, based on the analysis, was that drilling would not be conducted within 20 ft of the edge of the Muckpile.

A.2.2 Surface Radiological Surveys

Before beginning drilling and sampling, walk-over and drive-over radiological surveys were conducted to identify surface and near surface areas with elevated readings (see [Figure A.3-1](#)).

Figure A.2-2
CAU 383 (E-Tunnel Sites) CASs

Uncontrolled When Printed

A.2.3 Muckpile Sample Locations

A total of 33 Muckpile locations were sampled: 15 biased locations (two locations were hand sampled) and 18 random locations. The Muckpile random sample locations at CAU 383 were identified using a simple random sampling strategy as defined in Gilbert (1987). Before commencing the drilling operations, Stoller-Navarro Joint Venture (SNJV) scientists used a Trimble Global Positioning System (GPS) total station surveying instrument to locate and mark each proposed sample location. The CAIP listed six biased sampling locations; the additional nine biased locations were identified and marked during a site visit by the Site Supervisor (SS) and DTRA to provide additional information on the outer edge of the Muckpile. This information was collected to support a potential corrective action that would have required this area to be excavated and cut away. After drilling operations were completed, all sampling locations were surveyed using a GPS to record the as-built locations.

A.2.4 Drainage Sample Locations

A total of 35 random locations were sampled in the drainage; 33 were hand sampled and two were sampled using the drill rig. The drainage random sample locations were identified using a simple random sampling strategy as defined in Gilbert (1987). Before beginning sampling operations, SNJV scientists used the Trimble GPS total station surveying instrument to identify and mark the proposed sample locations. After sampling operations were completed, all sampling locations were surveyed using the GPS to record the as-built locations.

A.2.5 Pond Sample Locations

Nine locations were sampled in three of the ponds as specified in the CAIP (DTRA, 2003). Ponds 4, 5, and 6 were not sampled because they are still receiving water from E-Tunnel. Four random locations and one biased location were sampled in Pond 1, two biased location in Pond 2, and two biased locations in Pond 3 (Ponds 2 and 3 were hand sampled). Before beginning drilling operations, SNJV scientists used the Trimble GPS total station surveying instrument to identify and mark the proposed random sample locations. The biased locations were chosen and marked by the client and SS during drilling operations. After sampling operations were completed, all sampling locations were surveyed using the GPS to record the as-built locations.

A.2.6 Radioactive Material (CAS 12-28-02) Sample Locations

Four biased locations in the Radioactive Material CAS were sampled, all by hand. Before beginning sampling operations, SNJV scientists marked the proposed sample locations. After sampling operations were completed, all sampling locations were surveyed using the GPS to record the as-built locations.

A.2.7 Oil Spill (CAS 12-25-02) Sample Locations

Eight biased locations in the Oil Spill CAS were sampled, all by hand. Before beginning sampling operations, SNJV scientists marked the proposed sample locations. After sampling operations were completed, all sampling locations were surveyed using a GPS to record the as-built locations.

A.2.8 Background and Preliminary Sample Locations

Three biased locations were hand sampled in undisturbed areas near the Muckpile for background information. In addition, five biased locations were hand sampled on the Muckpile for preliminary safety and health information. These samples were collected in February and March 2004, before beginning drilling activities. The SNJV scientists used the Trimble GPS total station surveying instrument to record the sample locations.

A.2.9 Checklists

To increase the efficiency and completeness of the field effort, checklists were used during the E-Tunnel Sites characterization to track individual field tasks. [Table A.2-1](#) contains a list of the checklists, as well as detailing when and how often each checklist was used.

**Table A.2-1
List of Checklists**

Checklist	Purpose	Responsible Persons	Frequency	Timing
Waste Management Pre-Field	Ensure that all appropriate documentation has been prepared and issued, and everything is ready to properly handle all waste streams generated at the site.	Waste Management Coordinator	Once	Before mobilization
Health & Safety Pre-Field and Mobilization	Ensure all documents and required forms have been prepared and are available, all facilities have been notified, all personnel have the required training and certifications, all health and safety (H&S) monitoring equipment is available and operational, and all H&S supplies are available at the site. This will mitigate potential exposures to personnel and reduce the risk of accidents.	Site Safety Officer	Once	Before and during mobilization
Mobilization	Ensure that the site is ready for the field activities, all documentation is in place, and equipment and supplies are available on site.	Site Supervisor	Once	Before field work begins
Geologist	Ensure the hole is properly field screened and logged, all required information is entered on the borehole log, and the hole is properly abandoned and marked.	Rig Geologist	One for each borehole	During and after drilling
Drill Rig Safety Inspection	Ensure the drill rig meets all required safety standards to mitigate possible personnel injury resulting from faulty or worn equipment, and/or inadequate safety devices.	Site Supervisor and/or Rig Geologist and Site Safety Officer	Once	Before the start of field work
Sampling	Ensure all supplies are ready for the day's sampling, the samples are collected and handled properly, that required quality assurance (QA)/QC samples are collected, and all paperwork is completed correctly.	Sampler	Daily	Before, during, and after sampling
Decontamination	Ensure adequate equipment and supplies are available for the day, decontaminated equipment is properly handled and screened if contamination is encountered, and rinsate and any sediment generated is properly handled.	Rig Geologist and/or Site Safety Officer	Daily on days when decon is done	Before, during, and after decontamination
Pressure Washer	Ensure the pressure washer is safe and operational.	Equipment Operator and/or Rig Geologist	Initial entry to site, daily before use	Before use of the equipment

A.3.0 Muckpile Investigation

The drive-over and walk-over radiological surveys at CAU 383 were completed in September 2003. Mobilization of equipment and supplies and site setup for the characterizations at E-Tunnel Sites took place May 17 and 18, 2004. The CAI of the E-Tunnel Sites was conducted over 27 workdays between May 19 and June 24, 2004. The drillers mobilized to the site on May 18. Drilling commenced on May 19 and continued to June 14. From June 14 through June 24, hand samples were collected, as-built GPS surveys were conducted, and demobilization of equipment was completed.

All visitors coming on site had to check in with the Facility Manager Representative, the SS, or the Site Safety Officer (SSO) to receive a site-specific health and safety briefing and the tailgate safety briefing before being allowed on site.

A.3.1 Work Packages

At CAU 383, DTRA is the primary Real Estate/Operations Permit (REOP) holder (REOP Number DTRA-12) and is responsible for safety at the site. Three Work Packages were prepared by Shaw/SNJV and approved by DTRA so that the work could be conducted under the DTRA REOP. Work package *Shaw-2003-DTRA-01* covered the drive-over and walk-over surveys. Work package *SNJV 04 E 01* covered mobilization and demobilization from the site and all activities involved in the characterization. Work package *SNJV 04 E 02* covered the waste management activities, which continued after the field work was completed. All of the waste has been removed from the site.

Before beginning field work, an NTS Operations Schedule B form was filled out and sent to the Site Operations Center and Bechtel Nevada (BN) to advise them of the planned work activities, locations, dates, and times.

A.3.2 Surface Radiological Surveys

The walk-over and drive-over radiological surveys were completed in September 2003. Results from both the walk-over and drive-over surveys are shown in [Figure A.3-1](#).

Figure A.3-1
CAU 383 Radiological Surveys

The drive-over radiological survey of the Muckpile was conducted by towing a Dual Large-Area Plastic Scintillation (DLAPS) Detector Model VRM-3, with a TSA Model SC-755 Controller, and a Trimble Pathfinder Pro XRS™ GPS receiver with a TSC1™ data logger behind a four-wheel-drive vehicle. Each radiological measurement was taken with the DLAPS detector and recorded on the TSC1 data logger. Each point was then stored with its related GPS location measurement in a combined file. Approximately 6 acres were surveyed and a total of 6,782 beta/gamma measurements were recorded. The highest beta/gamma measurement detected was 3,959 counts per second (cps) at Nevada State Plane coordinates E 637,788.0, N 887,586.0. This high level is four times greater than the background radiation emission rate of 993 cps ([Figure A.3-1](#)).

The walk-over radiological survey was conducted by walking over the drainage carrying a Small Area Plastic Scintillation (SAPS) Detector Model 8204, with a TSA Model SC-755 Controller, and a Trimble Pathfinder Pro XRS™ GPS receiver with a TSC1™ data logger. Each radiological measurement was taken with the SAPS detector and recorded on the TSC1 data logger and stored with its related GPS measurement in a combined file. Approximately 2 acres were surveyed and more than 25,000 beta/gamma measurements were recorded. The highest beta/gamma measurement detected was 1,160 cps at Nevada State Plane coordinates E 638,076.6, N 887,817.5. This high level is 5.2 times greater than the background radiation emission rate of 214 cps ([Figure A.3-1](#)).

A.3.3 Muckpile Samples, CAS 12-06-06

Soil sampling was accomplished by either drilling or hand sampling. Drilling consisted of drilling boreholes through the Muckpile into the native material underneath using the roto sonic drilling method. If the native material was alluvial in nature, the borehole was advanced 5 ft into the native material or until refusal. If the native material was bedrock, the borehole was only advanced 2 ft into the native material or until refusal. Copies of the soil boring logs for all boreholes are in Attachment A. Hand sampling consisted of using hand tools to collect a sample from a depth of 0 to 0.5 ft or until refusal. A total of 1,039.5 ft of drilling was completed in 32 boreholes. Samples were collected to characterize the Muckpile and/or the native material under the Muckpile in 31 of the boreholes (borehole EMH02 was not sampled; borehole EMH2A was drilled and sampled as the alternate). Two locations were not accessible to the drill rig and were sampled by hand. Cross sections of the Muckpile are in [Attachment B](#). The random locations were designated as EMH01 through EMH18 and the biased locations were designated

EMB01 through EMB15 ([Figure A.3-2](#)). The boreholes were drilled to depths ranging from 1.5 to 91.5 ft.

Up to three soil samples were collected from each random borehole ([Table A.3-1](#)). In each borehole one sample was collected at a randomly selected depth (the z-depth) and one from the bottom of the borehole. In addition, a sample could be collected from sections of core where field screening indicated elevated alpha, beta, gamma, or flame-ionization detector (FID) levels. Three soil samples could have been collected from each biased borehole: one from the top of the borehole and additional samples from sections of core where field screening indicated elevated readings. One sample was collected from each of the hand-sample locations. If the field screening identified elevated readings for any hand sample, additional samples could be taken. No additional samples were taken from the hand-sample locations due to refusal. A total of 41 environmental soil samples were collected to characterize the muckpile, and 25 environmental soil samples were collected to characterize the native material underneath the muckpile. All of the soil samples were sent to an off-site laboratory to be analyzed for VOCs, semivolatile organic compounds (SVOCs), total petroleum hydrocarbons (TPH)-diesel-range organics (DRO), beryllium, total *Resource Conservation and Recovery Act* (RCRA) metals, and radionuclides.

Figure A.3-2
CAU 383 Muckpile Sampling Locations

Table A.3-1
As-Built Muckpile Sampling Locations and Total Depth
(Page 1 of 2)

Hole #	North	East	Elevation	Sampling Method	Drill TD in ft	Hand TD in ft	# of Samples
Biased Muckpile Locations							
EMB01	887326.5	638886.7	6123.5	drill	12		1
EMB02	887371.8	638013.7	6136.0	drill	3.5		1
EMB03	887878.1	637712.6	6121.5	drill	9.5		2
EMB04	887812.1	638089.9	6119.3	hand		0.5	1
EMB05	887505.2	638378.0	6117.8	drill	86.5		3
EMB06	887386.0	638813.1	6105.0	drill	7.5		1
EMB07	888056.7	637580.3	6123.1	drill	5		1
EMB08	887404.7	638115.3	6132.5	drill	31.5		2
EMB09	887322.3	638941.3	6122.3	drill	14		3
EMB10	887435.4	638844.0	6102.2	drill	37		1
EMB11	887450.5	638781.0	6107.2	drill	25.5		3
EMB12	887487.9	638589.1	6123.1	drill	75		1
EMB13	887564.0	638432.6	6127.8	drill	91.5		2
EMB14	887672.4	638289.8	6121.6	drill	29		3
EMB15	887532.7	638461.1	6119.0	hand		0.5	1
				Total	427.5	1.0	26
Random Muckpile Locations							
EMH01	887433.7	638265.0	6128.6	drill	69		2
EMH02	887363.7	638721.6	6118.8	drill	5		0
EMH2A	887540.8	638332.6	6123.4	drill	45.5		3
EMH03	887442.1	638260.8	6131.4	drill	61.5		3
EMH04	887429.3	638606.1	6115.4	drill	42		2
EMH05	887462.7	638379.3	6123.6	drill	70		3
EMH06	887897.5	637771.1	6119.0	drill	1.5		1
EMH07	887475.6	638472.2	6123.5	drill	68		3
EMH08	887482.7	638309.3	6125.9	drill	59		2
EMH09	887824.4	637880.4	6121.9	drill	25		2
EMH10	887395.0	638571.8	6120.8	drill	20		2
EMH11	887858.6	637782.5	6116.5	drill	4.5		2

Table A.3-1
As-Built Muckpile Sampling Locations and Total Depth
(Page 2 of 2)

Hole #	North	East	Elevation	Sampling Method	Drill TD in ft	Hand TD in ft	# of Samples
EMH12	887374.4	638473.4	6124.1	drill	25.5		2
EMH13	887492.0	638209.0	6136.5	drill	21		2
EMH14	887613.0	638322.2	6129.7	drill	22.5		2
EMH15	887479.0	637912.1	6133.6	drill	4		2
EMH16	887726.3	638178.0	6127.8	drill	19.5		3
EMH17	887435.9	638653.1	6122.8	drill	36.5		2
EMH18	887333.0	638343.0	6129.9	drill	12		2
				Total	612.0	0	40

TD = Total depth

A.3.4 Drainage Soil Samples

There were 35 locations sampled in the drainage, and all were random locations collected to determine whether contamination is migrating in storm runoff. Due to the inaccessibility of most of the drainage to the drill rig, only two locations were drilled ([Figure A.3-3](#)), and 33 locations were sampled using hand tools. At the locations sampled with the roto sonic drill rig, a hole was drilled to a depth of 5 ft, and one sample was collected. At the hand-sampled locations, one sample was collected between 0 and 0.5 ft bgs. A total of 10 ft of roto sonic drilling and 16.5 ft of hand digging was completed in two boreholes and 33 hand-sample locations to characterize the drainage. Once the drill core was recovered, it was field screened and sampled. If the field screening did not identify elevated readings for any sections of core, a sample was collected between 0 and 1 ft, and no other samples were collected. No sections of drill core were found that had elevated radiological readings. The hand samples were collected between 0 and 0.5 ft. As stated in the CAIP (DTRA, 2003), if the field screening identified elevated readings for any hand sample, additional samples would be taken. No additional samples were taken from the hand-sample locations due to refusal. A total of 35 environmental soil samples were collected from 35 locations to characterize the soil in the drainage. Sample locations in the drainage were designated EDH01 through EDH35. All of the soil samples were sent to an off-site laboratory to be analyzed for VOCs, SVOCs, TPH-DRO, beryllium, total RCRA metals, and radionuclides. The drainage sampling locations and total depths are shown in [Table A.3-2](#).

Figure A.3-3
CAU 383 Drainage Sampling Locations

Table A.3-2
As-Built Drainage Sampling Locations and Total Depths
(Page 1 of 2)

Hole #	North	East	Elevation	Sampling Method	Drill TD in ft	Hand TD in ft	# of Samples
Random Drainage Locations							
EDH01	887739.2	638589.8	6007.8	hand		0.5	1
EDH02	887739.6	638599.3	6006.8	hand		0.5	1
EDH03	887733.6	638607.1	6004.1	hand		0.5	1
EDH04	887734.1	638619.8	6003	hand		0.5	1
EDH05	887731.5	638628.4	6003.1	hand		0.5	1
EDH06	887731.2	638640.7	5998.9	hand		0.5	1
EDH07	887732	638649.9	5997.1	hand		0.5	1
EDH08	887729.5	638661.1	5999.9	hand		0.5	1
EDH09	887735.5	638678	5997.2	hand		0.5	1
EDH10	887734.2	638686.2	5995.1	hand		0.5	1
EDH11	887726.6	638697.8	5984.3	hand		0.5	1
EDH12	887730	638716.7	5983.9	hand		0.5	1
EDH13	887720	638737.5	5970.7	hand		0.5	1
EDH14	887723.2	638745.4	5982.0	hand		0.5	1
EDH15	887712.1	638759.5	5976.8	hand		0.5	1
EDH16	887711.1	638780.1	5983.1	hand		0.5	1
EDH17	887713.1	638786.0	5978.8	hand		0.5	1
EDH18	887710.6	638797.7	5977.6	hand		0.5	1
EDH19	887707.0	638808.0	5975.1	hand		0.5	1
EDH20	887704.0	638818.3	5972.7	hand		0.5	1
EDH21	887711.5	638827	5976.5	hand		0.5	1
EDH22	887718.5	638836.6	5972	hand		0.5	1
EDH23	887721.1	638844.8	5976.1	hand		0.5	1
EDH24	887721.4	638855	5972.1	hand		0.5	1
EDH25	887720	638875.3	5968	hand		0.5	1
EDH26	887720	638886.7	5971.4	hand		0.5	1
EDH27	887719.7	638896	5970.9	hand		0.5	1
EDH28	887722.7	638906.4	5972.1	hand		0.5	1
EDH29	887723.1	638916.6	5969.8	hand		0.5	1

Table A.3-2
As-Built Drainage Sampling Locations and Total Depths
(Page 2 of 2)

Hole #	North	East	Elevation	Sampling Method	Drill TD in ft	Hand TD in ft	# of Samples
EDH30	887722.5	638926.3	5971.0	hand		0.5	1
EDH31	887723.8	638935.6	5969.6	hand		0.5	1
EDH32	887723.2	638946.3	5968.2	hand		0.5	1
EDH33	887721.4	638955.9	5963.7	hand		0.5	1
EDH34	887717.9	638966.2	5964.4	drill	5.0		1
EDH35	887712.3	638983.2	5961.7	drill	5.0		1
				Total	10.0	16.5	35

A.3.5 Pond Soil Samples

Fourteen pond soil samples were collected from nine pond locations. Four random and one biased sampling locations were drilled in Pond 1. Ponds 2 and 3 had two biased hand-sampling locations each ([Figure A.3-4](#)). At the random locations, a hole was drilled to depths of 18 to 21 ft, and two samples were collected. One sample was collected at a randomly selected depth (the z-depth) and one from the bottom of the borehole. Two soil samples were collected from the biased borehole as well, one from above the native material contact and one from the bottom of the borehole (this borehole was 5 ft deep). At the hand-sampled locations (Ponds 2 and 3), a hole was dug to 0.5 ft deep, and one sample was collected. Pond 1 had five sample locations drilled. Due to the wetness of the soil in Ponds 2 and 3, only two locations were hand sampled in each pond. As stated in the CAIP (DTRA, 2003) if the field screening identified elevated readings for any hand sample, additional samples could be taken. No additional samples were taken from the hand-sample locations due to refusal. A total of 80 ft of rotosonic drilling and 2 ft of hand digging was completed in five boreholes and four hand-sample locations. Drilling consisted of drilling boreholes through the pond sediments (muck) into the native material underneath using the rotosonic drill rig. Once the core was recovered, it was field screened and sampled. A total of 14 environmental soil samples, nine muckpile material and five native material, were collected from nine locations to characterize the ponds. Ponds 4, 5, and 6 were not sampled because they are still active and receiving discharge water from E-Tunnel.

In the ponds, random sample locations were designated EPH01 through EPH04, and the biased samples location were designated as EPB01 through EPB05. All of the soil samples were sent to

Figure A.3-4
CAU 383 Ponds Sampling Locations

Table A.3-3
As-Built Ponds Sampling Locations and Total Depths

Hole #	North	East	Elevation	Sampling Method	Drill TD in ft	Hand TD in ft	# of Samples
Biased Pond Locations							
EPB01	887711.6	639006.6	5959.0	drill	5.0		2
EPB02	887648.3	639275.7	5917.5	hand		0.5	1
EPB03	887622.8	639329.0	5927.1	hand		0.5	1
EPB04	887624.5	639090.5	5942.3	hand		0.5	1
EPB05	887652.8	639152.3	5935.2	hand		0.5	1
				Total	5.0	2.0	6
Random Pond Location							
EPH01	887706.3	639072.3	5954.9	drill	17.0		2
EPH02	887666.4	639036.1	5954.3	drill	18.0		2
EPH03	887668.5	639047.4	5964.2	drill	21.0		2
EPH04	887678.9	639033.9	5943.2	drill	19.0		2
				Total	75.0		8

an off-site laboratory to be analyzed for VOCs, SVOCs, TPH-DRO, beryllium, total RCRA metals, and radionuclides. The ponds sampling locations and total depths are shown in [Table A.3-3](#).

A.3.6 Oil Spill Soil Samples, CAU 12-25-02

Eight soil samples were collected from eight Oil Spill locations ([Figure A.3-5](#)). All of the locations were biased locations, and all were hand sampled. At each location, one sample was collected from 0 to 0.5 ft bgs. Four feet of hand digging was completed at eight hand-sample locations. In accordance with the CAIP (DTRA, 2003), if the field screening identified elevated readings for any hand-sample, additional samples could be taken. No additional samples were taken from the hand-sample locations due to refusal. In this CAS, the biased sample locations were designated as EOB01 through EOB08. All of the soil samples were sent to an off-site laboratory to be analyzed for VOCs, SVOCs, TPH-DRO, beryllium, total RCRA metals, and radionuclides. The Oil Spill sampling locations and total depths are shown in [Table A.3-4](#).

A.3.7 Radioactive Material Soil Samples, CAU 12-28-02

Four soil samples were collected from four Radioactive Material area locations ([Figure A.3-5](#)). All of the locations were biased locations, and all were hand sampled. At each location, one sample was collected from 0 to 0.5 ft bgs. In accordance with the CAIP (DTRA, 2003), 2 ft

of hand digging was completed at four hand-sample locations. If the field screening identified elevated readings for any hand-sample additional samples could be taken; however, no additional samples were taken due to refusal. In this CAS, the biased sample locations were designated as ERB01 through ERB04. All of the soil samples were sent to an off-site laboratory to be analyzed for VOCs, SVOCs, TPH-DRO, beryllium, total RCRA metals, and radionuclides. The Radioactive Material area sampling locations and total depths are shown in [Table A.3-4](#).

A.3.8 Background and Preliminary Soil Samples

The client and SS selected three undisturbed locations adjacent to the E-Tunnel Sites for collection of background native soil samples, and four locations from the surface of the Muckpile for the collection of preliminary samples. All the sampling locations were hand-sampled biased locations, and all the samples were collected at 0.5 ft below ground surface in February 2004 ([Figure A.3-6](#)). Both sets of samples were sent to an off-site laboratory and analyzed for beryllium, lead, arsenic, and radionuclides. In March 2004, a biased hand sample was collected from a contaminated layer, approximately 6 inches below the surface in front of the E-Tunnel main portal (location EGB09). The sample was sent to an off-site laboratory, and analyzed for strontium-90, isotopic plutonium, and gamma spec. These sample locations were designated as EGB01 through EGB09. Locations EGB05, EGB06, and EGB07 are the background sampling locations, and EGB01, EGB02, EGB03, EGB04, and EGB09 are the preliminary sampling locations (there is no location EGB08). The sampling location coordinates and total depths are shown in [Table A.3-5](#).

Figure A.3-5
CAU 383 Oil Spill and Radioactive Material Sampling Locations

Table A.3-4
As-Built Oil Spill and Radioactive Material
Sampling Locations and Total Depths

Hole #	North	East	Elevation	Sampling Method	Drill TD in ft	Hand TD in ft	# of Samples
Biased Oil Spill Locations							
EOB01	637635.3	887570.3	6217.6	hand		0.5	1
EOB02	637641.1	887568.9	6218.0	hand		0.5	1
EOB03	637623.9	887531.0	6213.9	hand		0.5	1
EOB04	637647.3	887535.2	6220.8	hand		0.5	1
EOB05	637630.7	887602.0	6218.3	hand		0.5	1
EOB06	637658.3	887599.8	6213.0	hand		0.5	1
EOB07	637640.6	887598.8	6207.4	hand		0.5	1
EOB08	637654.6	887605.2	6220.9	hand		0.5	1
				Total		4.0	8
Biased Radiation Material Locations							
ERB01	637709.2	887807.9	6122.6	hand		0.5	1
ERB02	637716.4	887818.4	6119.5	hand		0.5	1
ERB03	637728.3	887812.1	6121.3	hand		0.5	1
ERB04	637737.4	887795.6	6118.7	hand		0.5	1
				Total		2.0	4

Figure A.3-6
CAU 383 Background and Preliminary Sampling Locations

**Table A.3-5
As-Built Background and Preliminary Sampling Locations Total Depths**

Hole #	North	East	Elevation	Sampling Method	Drill TD in ft	Hand TD in ft	# of Samples
Biased Background / Preliminary Locations							
EGB01	887900.2	637809.9	6122.7	hand		0.5	1
EGB02	887429.3	637857.8	6130.6	hand		0.5	1
EGB03	887383.3	638269.0	6129.3	hand		0.5	1
EGB04	887511.6	638310.9	6123.5	hand		0.5	1
EGB05	886877.4	638050.2	6356.9	hand		0.5	1
EGB06	887189.7	639180.4	6132.5	hand		0.5	1
EGB07	887645.5	639600.3	5913.3	hand		0.5	1
EGB09	887856.9	637771.0	6122.7	hand		0.5	1
				Total		4.0	8

A.3.9 Other Sampling

In addition to the environmental samples, 51 QA/QC and other samples were collected during the site characterization. The QA/QC samples included eight blind duplicate samples, collected and analyzed to check on the laboratory's precision; seven laboratory QC samples, collected to check for matrix interference; seven rinsate samples, collected to check on the effectiveness of the decontamination procedures; seven field blanks, collected to check on possible environmental interferences; and 22 trip blanks, sent with the VOC samples.

Other sampling consisted of collecting a water sample from the driller's water truck (a source blank). All of the QC samples were sent to the off-site laboratory for analysis.

A.4.0 Results

A spreadsheet of the analytical results from the CAU 383 E-Tunnel Sites investigation is provided in [Attachment C](#). The spreadsheet includes only those analytical results where COPCs were reported above the measured detectable concentration, even if the detect was qualified as estimated (J qualifier) or the radionuclide identification was tentative (TI qualifier). A detect indicates that the parameter was identified in the sample, and does not have any reference to action levels or regulatory limits. The analytical results from the investigation are summarized in the following tables. Results from duplicate samples are not included. If a sample was re-analyzed by the laboratory, the re-analysis results are included in the table, not the original results. [Table A.4-1](#) is a summary of the detects from the muckpile and Ponds, muck and native soil samples, which were analyzed for VOCs, SVOCs, TPH-DRO, beryllium, total metals, and radionuclides. [Table A.4-2](#) is a summary of the detects from the Radioactive Material area, Oil Spill, drainage, and QC water samples, which were analyzed for VOCs, SVOCs, TPH-DRO, beryllium, total metals, and radionuclides. All the QC water sample results were included. [Table A.4-3](#) is a summary of the detects from the background/preliminary soil samples, collected before beginning characterization, which were analyzed for beryllium, total metals, and radionuclides. An analysis of the data, including comparisons to action levels and regulatory limits, is discussed in [Section 2.0](#) of the main document and in [Appendices C](#) and [D](#).

Table A.4-1
Analytical Result Detects for Muckpile and Pond Samples
(Page 1 of 4)

	Muckpile				Ponds			
	Native		Muck		Native		Muck	
	Range	No. of detects	Range	No. of detects	Range	No. of detects	Range	No. of detects
Volatile Compounds	µg/kg		µg/kg		µg/kg		µg/kg	
1,2,4-Trimethylbenzene	ND	0	7.2	1	ND	0	ND	0
1,3,5-Trimethylbenzene	ND	0	7.2	1	ND	0	ND	0
Acetone	5.7-18	11	7.2-10.0	9	6.7-25	5	7.2-14.0	3
Ethylbenzene	ND	0	80	1	ND	0	1.6	1
Hexachlorobutadiene	1.5	1	ND	0	1.7	1	ND	0
M+P-Xylene	ND	0	1200	1	ND	0	8.3	1
Methylene Chloride	0.78-1.6	13	0.83-9.5	23	ND	0	0.95-1.2	3
N-Propylbenzene	ND	0	5.9	1	ND	0	ND	0
O-Xylene	ND	0	1.2-780.0	2	ND	0	3.3	1
P-Isopropyltoluene	ND	0	1.3-13.0	2	ND	0	ND	0
Semivolatile Compounds	µg/kg		µg/kg		µg/kg		µg/kg	
2-Methylnaphthalene	ND	0	68	1	ND	0	ND	0
Acenaphthene	ND	0	22	1	ND	0	ND	0
Acenaphthylene	ND	0	14	1	ND	0	ND	0
Anthracene	ND	0	170	1	ND	0	ND	0
Benzo(A)Anthracene	22	1	18-1200	10	ND	0	21-26	2
Benzo(A)Pyrene	16	1	15-1300	7	ND	0	18-28	2
Benzo(B)Fluoranthene	28	1	18-1700	8	ND	0	31-59	2

Table A.4-1
Analytical Result Detects for Muckpile and Pond Samples
(Page 2 of 4)

	Muckpile				Ponds			
	Native		Muck		Native		Muck	
	Range	No. of detects	Range	No. of detects	Range	No. of detects	Range	No. of detects
Benzo(G,H,I)Perylene	ND	0	68-760	4	ND	0	ND	0
Benzo(K)Fluoranthene	ND	0	34-650	6	ND	0	31	1
Bis(2-Ethylhexyl)Phthalate	84-220	2	72-170	6	ND	0	85-330	2
Butyl Benzyl Phthalate	ND	0	35	1	ND	0	ND	0
Butyl Benzyl Phthalate	ND	0	35	1	ND	0	ND	0
Carbazole	ND	0	57	1	ND	0	ND	0
Chrysene	23	1	21-1000	8	ND	0	30-66	2
Dibenzofuran	ND	0	65	1	ND	0	ND	0
Di-N-Butyl Phthalate	ND	0	26	2	ND	0	ND	0
Fluoranthene	23	1	21-1500	8	ND	0	20-31	3
Fluorene	ND	0	16	1	ND	0	ND	0
Indeno(1,2,3-Cd)Pyrene	ND	0	27-630	5	ND	0	ND	0
Naphthalene	ND	0	19	1	ND	0	ND	0
Phenanthrene	ND	0	30-350	6	ND	0	ND	0
Pyrene	ND	0	91-1600	6	ND	0	50-63	2
Petroleum Hydrocarbons	mg/kg		mg/kg		mg/kg		mg/kg	
Diesel-Range Organics	700	1	3.2-300	16	ND	0	1.9-330	7
Metals	mg/kg		mg/kg		mg/kg		mg/kg	
Arsenic	0.31-3.8	23	0.7-6.0	41	1.7-2.9	5	1.0-14.0	9

Table A.4-1
Analytical Result Detects for Muckpile and Pond Samples
(Page 3 of 4)

	Muckpile				Ponds			
	Native		Muck		Native		Muck	
	Range	No. of detects	Range	No. of detects	Range	No. of detects	Range	No. of detects
Barium	2.6-370	25	22.0-7000	41	71.0-3200	5	320-6300	9
Beryllium	0.15-1.0	25	0.42-2.4	41	0.65-1.0	5	0.19-2.0	9
Cadmium	0.019-1.0	20	0.03-15.0	28	0.092-0.17	5	0.052-0.39	9
Chromium	0.91-5.8	25	0.49-33.0	41	1.7-3.4	5	1.4-12.0	9
Lead	1.1-160	16	3.4-120	41	5.7-12.0	5	5.3-38	9
Mercury	0.008-0.33	25	0.0012-0.51	40	0.011-0.12	5	0.0016-0.048	9
Selenium	0.26-0.29	2	0.24-0.99	12	ND	0	0.31-0.65	4
Silver	0.071-2.8	20	0.1-1.1	5	0.48	1	0.077	1
Radionuclides	pCi/g		pCi/g		pCi/g		pCi/g	
Actinium-228	0.42-2.14	5	0.5-2.89	39	1.67-2.4	5	1.48-2.31	7
Aluminum-26	ND	0	0.108	1	ND	0	ND	0
Americium-241	1.1	1	0.52-28.8	9	ND	0	0.72	1
Bismuth-212	ND	0	1.77-3.7	6	ND	0	ND	0
Bismuth-214	0.26-0.92	13	0.39-2.08	36	0.96-1.49	5	0.95-1.72	8
Cesium-137	0.121-9.8	9	0.15-1060	39	0.33-4.34	2	0.78-142	8
Europium-152	ND	0	2.64	1	ND	0	ND	0
Europium-155	0.32	1	ND	0	ND	0	ND	0
Potassium-40	2.05-31.7	11	3.7-43.8	41	26.2-33.2	5	8.1-33.7	9
Lead-212	0.212-2.27	10	0.35-3.37	39	1.87-2.76	5	0.27-2.73	9

Table A.4-1
Analytical Result Detects for Muckpile and Pond Samples
(Page 4 of 4)

	Muckpile				Ponds			
	Native		Muck		Native		Muck	
	Range	No. of detects	Range	No. of detects	Range	No. of detects	Range	No. of detects
Plutonium-239	0.03-4.55	7	0.016-84.0	28	0.154	1	0.305-5.37	6
Strontium-90	0.048-0.33	2	0.21-54.0	16	ND	0	0.76-3.58	5
Thorium-234	1.8	1	2.7	1	ND	0	ND	0
Thallium-208	0.093-0.76	7	0.131-1.02	34	0.59-1.05	5	0.51-0.8	8
Total No. of Samples Collected		25		41		5		9

mg/kg = Milligrams per kilogram
ND = Not detected
pCi/g = Picocuries per gram
µg/kg = Micrograms per kilogram

Table A.4-2
Analytical Result Detects for the Radioactive Material,
Oil Spill, Drainage, and QC Water Samples
(Page 1 of 4)

	Radioactive Material		Oil Spill		Drainage		QC Water	
	Range	No. of detects	Range	No. of detects	Range	No. of detects	Range	No. of detects
Volatile Compounds	µg/kg		µg/kg		µg/kg		µg/L	
2-Butanone	ND	0	11.0-17.0	2	10	1	ND	0
Acetone	ND	0	7.2-72.0	3	6.2-39.0	12	6.9-25.0	9
Chloromethane	ND	0	ND	0	ND	0	0.58-0.71	2
Ethylbenzene	ND	0	ND	0	1.2-11.0	6	ND	0
Hexachlorobutadiene	ND	0	ND	0	1.6	1	ND	0
M+P-Xylene	ND	0	ND	0	2.1-57.0	11	ND	0
Methylene Chloride	ND	0	ND	0	0.82-4.0	28	0.75-15.0	18
O-Xylene	ND	0	ND	0	1.0-23.0	7	ND	0
Styrene	ND	0	ND	0	0.99-3.6	4	ND	0
Toluene	ND	0	ND	0	1.0-1.6	4	0.61-1.3	4
Semivolatile Compounds	µg/kg		µg/kg		µg/kg		µg/L	
Acenaphthene	ND	0	39-93	2	ND	0	ND	0
Anthracene	ND	0	86-470	3	ND	0	ND	0
Benzo(A)Anthracene	56-170	4	14-18000	8	26-66	3	ND	0
Benzo(A)Pyrene	39-230	4	64-23000	6	37-64	3	ND	0
Benzo(B)Fluoranthene	84-620	4	140-43000	6	51-62	3	ND	0
Benzo(G,H,I)Perylene	90	1	59-16000	4	46	1	ND	0

Table A.4-2
Analytical Result Detects for the Radioactive Material,
Oil Spill, Drainage, and QC Water Samples
(Page 2 of 4)

	Radioactive Material		Oil Spill		Drainage		QC Water	
	Range	No. of detects	Range	No. of detects	Range	No. of detects	Range	No. of detects
Benzo(K)Fluoranthene	41-230	4	45-19000	6	25-57	3	ND	0
Bis(2-Ethylhexyl)Phthalate	76-1200	4	710-3900	2	82-2400	8	5.9-42.0	14
Butyl Benzyl Phthalate	23-630	2	ND	0	33-40	2	ND	0
Carbazole	23	1	160-790	3	ND	0	ND	0
Chrysene	63-480	4	110-23000	8	55-100	3	ND	0
Dibenzo(A,H)Anthracene	27	1	2100-10000	2	ND	0	ND	0
Dimethyl Phthalate	ND	0	ND	0	14	1	ND	0
Di-N-Butyl Phthalate	45-5100	4	ND	0	23	1	ND	0
Di-N-Octyl Phthalate	ND	0	ND	0	59	1	ND	0
Fluoranthene	86-510	4	93-13000	8	13-120	4	ND	0
Fluorene	ND	0	31-68	2	ND	0	ND	0
Indeno(1,2,3-Cd)Pyrene	80	1	54-12000	3	ND	0	ND	0
Naphthalene	18	1	15-56	4	ND	0	ND	0
Phenanthrene	38-210	4	32-2500	8	49	1	ND	0
Pyrene	73-430	4	75-64000	8	41-190	3	ND	0
Petroleum Hydrocarbons	mg/kg		mg/kg		mg/kg		mg/L	
Diesel-Range Organics	3.0-15	3	63-3400	6	1.8-6.8	8	ND	0

Table A.4-2
Analytical Result Detects for the Radioactive Material,
Oil Spill, Drainage, and QC Water Samples
(Page 3 of 4)

	Radioactive Material		Oil Spill		Drainage		QC Water	
	Range	No. of detects	Range	No. of detects	Range	No. of detects	Range	No. of detects
Metals	mg/kg		mg/kg		mg/kg		µg/L	
Arsenic	4.5-7.1	4	2.9-7.1	8	2.2-5.3	35	3.7-19.0	2
Barium	140-260	4	140-300	8	750-6600	35	0.49-13.0	6
Beryllium	0.84-1.7	4	0.64-1.2	8	0.77-2.1	35	0.06-0.09	2
Cadmium	0.56-0.57	2	0.58-1.4	4	0.11-0.37	35	0.18	1
Chromium	3.2-9.1	4	2.5-10.0	8	1.1-9.2	35	1.7	1
Lead	18.0-61.0	4	12.0-31.0	8	14.0-52.0	35	ND	0
Mercury	0.16	1	ND	0	0.0088-0.083	35	0.0066-0.03	10
Selenium	ND	0	1.2	1	0.29-1.1	9	2.4	1
Silver	ND	0	ND	0	ND	0	0.66-1.7	7
Actinium-228	1.26-2.9	4	1.27-2.21	8	0.7-2.26	35	ND	0
Aluminum-26	ND	0	ND	0	0.105	1	ND	0
Radionuclides	pCi/g		pCi/g		pCi/g		pCi/L	
Americium-241	ND	0	ND	0	1.88	1	ND	0
Bismuth-212	3.2	1	ND	0	ND	0	ND	0
Bismuth-214	0.7-1.12	3	0.58-1.1	8	0.76-1.48	35	ND	0
Cesium-137	7.06-114	4	0.53-20.5	8	2.72-78.1	35	ND	0
Potassium-40	21.4-27.8	4	19.8-25.0	8	17.0-34.5	35	ND	0

Table A.4-2
Analytical Result Detects for the Radioactive Material,
Oil Spill, Drainage, and QC Water Samples
(Page 4 of 4)

	Radioactive Material		Oil Spill		Drainage		QC Water	
	Range	No. of detects	Range	No. of detects	Range	No. of detects	Range	No. of detects
Lead-212	1.52-2.96	4	1.83-3.1	8	0.74-2.54	35	ND	0
Lead-214	0.93-1.04	3	0.86-1.06	7	0.8-1.68	34	ND	0
Plutonium-238	0.076-0.232	3	ND	0	0.04-0.73	32	ND	0
Plutonium-239	0.166-2.09	4	0.051-1.04	6	0.071-4.21	35	ND	0
Strontium-90	ND	0	ND	0	0.45-1.88	25	ND	0
Thorium-227	4.1	1	ND	0	ND	0	ND	0
Thorium-234	7.2	1	ND	0	2.4	1	ND	0
Thallium-208	0.47-0.85	4	0.54-0.97	8	0.3-0.87	34	ND	0
Total No. of Samples Collected		4		8		35		37

mg/kg = Milligrams per kilogram
mg/L = Milligrams per liter
ND = Not detected
pCi/g = Picocuries per gram

pCi/L = Picocuries per liter
µg/kg = Micrograms per kilogram
µg/L = Micrograms per liter

Table A.4-3
Analytical Results for Background / Preliminary Samples

	Background/Preliminary	
	Range	No. of Detects
Radionuclides	pCi/g	
Actinium-228	1.44-2.27	6
Americium-241	2.83	1
Bismuth-214	0.45-1.41	4
Cesium-137	0.46-180	7
Potassium-40	8.8-30.7	8
Lead-212	0.72-2.47	8
Lead-214	0.6-1.07	4
Plutonium-238	0.032-11.3	5
Plutonium-239	0.093-61.0	8
Strontium-90	18.8	1
Thallium-208	0.247-0.83	5
Total No. of Samples Collected		8
Metals	mg/kg	
Arsenic	2.6-5.3	7
Barium	130-290	3
Beryllium	0.72-1.3	6
Cadmium	0.11-0.32	2
Chromium	5.0-8.4	3
Lead	12.0-75.0	7
Mercury	0.032-0.065	3
Selenium	0.52-0.71	2
Total No. of Samples Collected		7*

mg/kg = Milligrams per kilogram

pCi/g = Picocuries per gram

* Sample 383GB901 was not analyzed for metals

A.5.0 Waste Management

Management of the investigation-derived waste (IDW) was guided by the CAU 383 CAIP (DTRA, 2003) requirements, field observations, and the results of the laboratory analysis of the E-Tunnel Sites characterization samples. Administrative controls were used to minimize the amount of waste generated during the investigation.

A.5.1 Waste Segregation

All wastes generated on the site were divided into either sanitary waste or IDW. The sanitary waste was disposed of in the dumpster located by Building 153. The IDW was segregated into solid (personal protective equipment [PPE] and plastic) and liquid (rinsate) waste streams to limit the amount of potentially contaminated waste.

A.5.2 Waste Generation and Accumulation

Waste generated during the field work was either sanitary waste or IDW. The sanitary waste consisted mostly of paper and kitchen debris generated in the field office and, in accordance with the waste minimization strategy, all PPE that was not visibly contaminated and not used when elevated field-screening results were found. The IDW consisted of potentially contaminated PPE, plastic, and all rinsates. This waste was dealt with as described in the rest of this section.

All IDW was put in U.S. Department of Transportation compliant, 55-gallon, steel drums. For drums receiving solid IDW, an absorbent (Stergo®) pad was placed in the bottom, and a plastic liner was inserted. After receiving waste, the drums were stored on plastic spill pallets in the fenced Hazardous Waste Accumulation Area (HWAA). After a drum received waste, it was marked with a unique identification number, labeled with a “Hazardous Waste Pending Analysis” sticker and a “Radioactive Material Pending Analysis” sticker, and secured with a tamper-indicating device (TID). A waste management logbook was used to track the drums used, the contents of each drum, where the material was used, and an estimate of how much material was in each drum. The volume of material recorded for each drum is an estimate of what was put in the drum.

A.5.2.1 Rinsates

The drill rig, tools, core barrels, drill bits, and sampling equipment (stainless-steel bowls) were decontaminated at the E-Tunnel decontamination pad before and after the work at E-Tunnel. After being decontaminated in the decontamination tub, the stainless-steel bowls, core barrels, and drill bits were cased in plastic sleeves to prevent them from getting contaminated before use. Each hole was drilled using the same core barrel and drill bit for the entire hole. When the hole was completed, they were decontaminated and sealed in plastic again. A clean stainless-steel bowl was used for each sample, after which it was decontaminated and sealed in plastic again. All liquid from the decontamination tub was containerized as rinsate.

Rinsate from the decontamination tub was transferred into an unlined 55-gallon drum staged next to the decontamination pad. Once used, each drum was marked and controlled (as stated above) and stored on a plastic spill pallet in the fenced HWAA. Waste was added to the drum until it was full (leaving some ullage). It was then secured (as stated before) and moved back to the HWAA. The waste management logbook was used to track the drums used, where the equipment decontaminated with the rinsate was used, and an estimate of how much rinsate was in each drum.

A.5.2.2 Soil

No significant quantity of soil accumulated in the bottom of the decontamination tub, nor was any soil contaminated by spills, so no soil required disposal other than the drill core, which was disposed of in the borehole from which it came.

A.5.2.3 Personal Protective Equipment, Sampling Equipment, and Plastic Sleeves

The PPE used in the exclusion zone consisted of Tyvek[®] anti-contamination clothing, boot covers, cotton gloves, and nitrile or latex gloves. At the end of each shift, the PPE was evaluated with respect to the radiation emissions and the presence of visible contamination. If there were no elevated radiation emissions and there was no visible contamination, the PPE was determined to be sanitary waste and was disposed of in the roll off bin at Building 153. During the E-Tunnel Sites and drainage characterization no PPE was determined to be IDW (it was all disposed of as sanitary waste).

The disposable sampling equipment was collected in a plastic bag inside the exclusion zone as the sampling was conducted. The wastes were accumulated until the bag was filled, and then it was taped closed. If there were no elevated radiation emissions and there was no visible contamination, the waste was disposed of as sanitary waste at Building 153. None of the sampling wastes were determined to be IDW.

Plastic sleeves were used to keep the decontaminated core barrels clean before use and to containerize slough and core as it was removed from the boreholes. After sampling, the core and slough material was returned to the borehole. The empty sleeves were containerized in a clear plastic bag and handled in the same manner as the PPE.

A.5.2.4 Plastic Liners

Plastic liners were used under the drill rig and the support truck to prevent hydrocarbon leaks from getting on the ground. To minimize waste generation, each liner was used at several locations unless it was damaged or leaked on, or field screening of the liner indicated the presence of contamination, in which case the liner was replaced at the completion of the hole. When the plastic liners became damaged, leaked on or contaminated, the liner was containerized in a clear plastic bag, a waste tracking tag was attached, and the bag was put into a lined drum and treated as solid IDW (as described above). The samples collected while the plastic liner was in use were entered into the waste management logbook. The waste management logbook was updated each time additional liners were added to the drum. No liners were containerized due to the presence of contamination other than minor hydrocarbon leaks.

A.5.3 Waste Characterization

The IDW was considered potentially contaminated waste by virtue of contact with potentially contaminated media or elevated radiological emissions. No IDW was containerized due to elevated radiological emissions. Therefore, additional sampling and analysis of the IDW, separate from the borehole soil sampling and analysis, was not required unless the sample results showed the potential for the IDW to be contaminated. The data generated as a result of the site characterization were used to make waste determinations of the IDW.

The IDW was characterized by identifying the borehole samples associated with each waste container and then comparing the analytical results from those samples to various standards. For the hazardous waste determination, the borehole sample results were compared to the RCRA

waste characterization levels for hazardous waste. For total petroleum hydrocarbon wastes, the sample results were compared to the *Nevada Administrative Code* for TPH-DRO determination (NAC, 2005). For the low-level radioactive waste determination, the sample results were compared to the BN 2000 Application for Permit to Operate a Class II Solid Waste Disposal Site at the NTS (BN, 2000), and to the National Council on Radiation Protection and Measurements report entitled *Recommended Screening Limits for Contaminated Surface Soil and Review of Factors Relevant to Site-Specific Studies* (NCRP, 1999) and DOE Order 5400.5 Change 2, “Radiation Protection of the Public and Environment” (DOE, 1993).

A.5.4 Waste Disposal

The hazardous waste determination did not identify any drums that were associated with samples that contained a high-enough concentration of hazardous constituents to be considered hazardous. However, the two drums that contained hydrocarbon-stained plastic were shipped to the hydrocarbon landfill for disposal as hydrocarbon waste.

The preliminary radiological waste determination identified several samples that had radionuclide levels above the preliminary action level. However, when comparing the volume of soil in the drums required to be present to be regulated to the most conservative theoretical maximum amount of soil actually present in the drums, the action level was not exceeded. Therefore, the drums were nonradioactive

[Table A.5-1](#) provides a tally of the number of drums used, what they contained, and their final disposition. Five of the drums of IDW were disposed of as sanitary waste, and two drums (#383M04 and #383M05) were disposed of as hydrocarbon waste.

**Table A.5-1
Drum Count**

Number of Drums	Volume (Gallons)	Waste Stream	Disposition
4	182	Rinsate	Sanitary
1	10	PPE	Sanitary
2	60	Plastic	Hydrocarbon Landfill
Total Number 7			

A.6.0 Health and Safety

At the start of the project, a preliminary hazard assessment was prepared and used to guide the preparation of the SSHASP (SNJV, 2003), the Radiation Work Permit (SN2004-CAU383-01), and the CAU 383 CAIP (DTRA, 2003). The work was then performed in accordance with these documents.

Prefield H&S preparation was accomplished using a project-specific H&S checklist. The checklist was developed to ensure that all required items were verified and/or available before mobilization to the field.

A.6.1 Physical Hazards

The primary physical hazards fell into three general categories: fatigue; heat stress; and slip, trip, and fall. The sources of these hazards were the long drive to and from the work site, the general hazards of working around moving machinery, the high ambient air temperatures at NTS during that time of year, and working on uneven ground and around the slope of the Muckpile.

The hazards associated with fatigue; heat stress; and slip, trip, and fall were dealt with by discussing the long drive; the hazards involved with the machinery; heat stress symptoms; and site-specific slip, trip, and fall hazards during the morning tailgate safety meetings. The length of the workday was limited, and workers were observed by the SSO and SS for fatigue and heat stress and were encouraged to drink water. This ensured that workers did not become overly fatigued and could safely drive back to Mercury at the end of the day.

The hazard posed by the slope of the Muckpile was addressed by applying a restriction to drill no closer than 20 ft from the edge of the Muckpile. This conservative restriction ensured personnel did not work too close to the edge of the Muckpile and ensured that the vibrations and weight of the roto sonic drill rig would not cause the slope to fail.

A.6.2 Chemical and Radiological Hazards

Chemical hazards believed to be present included mostly hydrocarbon products, epoxies, and chemical grouts that may have been disposed of in the Muckpile. These products were used for fuels, ground support, and various other applications during mining operations. Radiological

hazards could possibly have come from the rock and construction waste deposited in the Muckpile during re-entry mining operations following nuclear testing.

Drive-over and walk-over radiological surveys were conducted at the E-Tunnel Muckpile and the drainage associated with the Muckpile. These surveys identified surface and near surface areas with elevated readings on the Muckpile, in the drainage and ponds, and near the compressor pad. The highest level was approximately 5.2 times greater than the background radiation emission rate. To ensure that radiological safety, additional precautions were taken during drilling and sampling activities, high-volume air samples were taken. No airborne radioactive particles were detected in the high-volume air sample filters during field activities. All personnel wore PPE in the exclusion zone. All the PPE was determined to be sanitary waste. After each shift, all personnel in the exclusion zone (EZ) were monitored for elevated radiation emission as they left the EZ. No elevated emissions were detected.

Products brought on site to assist with the characterization investigation were required to have a material safety data sheet before receiving approval for use. These items generally consisted of fuels, lubricants, and cooling and cleaning agents.

Action levels for the chemical constituents and radiological hazards were posted on the tailgate safety briefing as noted in the SSHASP. All intrusive work required real-time monitoring be conducted and the results documented on the Sample Collection Logs (SCLs) and the Soil Characterization Log. Field-screening results ensured action limits for occupational threats to personnel during the drilling and sampling operations were not exceeded.

As a precaution, all personnel wore gloves, boot covers, and Tyvek[®] anti-contamination clothing in the exclusion zone.

A.6.3 Drilling

An equipment inspection of each Boart-Longyear drill rig was performed by SNJV personnel upon their arrival on site and before any drilling activity. These inspections were documented on the Drill Rig Inspection form as described in the Field Instructions (DTRA, 2004). All safety devices were present and operational. In addition, the drill rig was inspected daily by the driller. This was recorded in the geologist's Field Activity Daily Log (FADL). The roto-sonic drill rigs were operated safely throughout the project.

A.6.4 Noise

During roto sonic drilling operations personnel exposure to noise is always a concern. Noise-level monitoring was conducted before startup and during actual drilling, with a sound-level meter set on the “A” scale with a slow response. Measurements indicated that average noise levels of 85 to 110 decibels were common within 35 ft of the drill rig. With this knowledge, all personnel working or observing operations within this distance were required to wear hearing protection. Personnel were also diligent in watching out for one another to make certain that hearing protection was available and in use before equipment startup.

A.6.5 Air Monitoring

A Photovac Micro FID was used for real-time air monitoring for VOCs during all intrusive work. The FID measures concentrations of photoionizable gases and records the values. The FID cannot distinguish between individual pollutants, it merely lets the operator know that something is present. During drilling activities at the Area 12 E-Tunnel Sites, the FID was used to measure concentrations in a worker’s breathing zone. All concentrations logged during field activities were below the established action level of one part per million sustained in the breathing zone.

In addition to the VOC monitoring, radiation monitoring was conducted daily through high-volume air sampling. One air sample was collected in the exclusion zone side of the sample van and another sample was collected in the clean side of the sample van. Two more air samplers were used to collect air samples (one at the exclusion zone hot line and one on the drill rig). These samples were collected by continuously drawing air through the two filters during work hours. Once work ceased for the day, the filters were removed and counted on a Tennelec series 5XLB, low-background alpha/beta counter. No airborne radioactive particles were detected in the high-volume air sample filters during field activities.

A.6.6 Personnel Monitoring

All personnel were required to wear a thermal luminescent dosimeter while working at the E-Tunnel site.

A.6.7 Training

Before assignment, all necessary training documentation for specific tasks was reviewed and verified as to current status. By verifying all documentation before personnel arrived on site, delays to track down missing or incomplete training documentation were minimized.

Training requirements for this project were outlined in the SSHASP and included 40-hour Hazardous Waste Operations and Emergency Response, annual 8-hour refresher, medical surveillance, and Radiological Worker II. Additional training for specific personnel included 8-hour supervisory training, first aid and cardiopulmonary resuscitation, bloodborne pathogens training, and classroom and field waste management training.

A.7.0 Lessons Learned

A lessons learned meeting was not held following the field work. The work went well, and because this was the sixth Mudpit/Muckpile field effort and no issues came out in the lessons learned meeting at the end of the field efforts, it was decided that little could be gained by holding an additional lessons learned meeting.

A.8.0 References

BN, see Bechtel Nevada.

Bechtel Nevada. 2000. *Application for Permit to Operate a Class II Solid Waste Disposal Site at the Nevada Test Site*. Las Vegas, NV

DOE, see U.S. Department of Energy

DTRA, see Defense Threat Reduction Agency.

Defense Threat Reduction Agency. 2003. *Corrective Action Investigation Plan for Corrective Action Unit 383: Area 12 E-Tunnel Sites, Nevada Test Site*, Rev. 0. Prepared by SNJV. Las Vegas, NV.

Defense Threat Reduction Agency. 2004. *Field Instructions for CAU 383: Area 12 E-Tunnel Sites*, Rev. 0. Prepared by SNJV. Las Vegas, NV.

FFACO, see *Federal Facility Agreement and Consent Order*.

Federal Facility Agreement and Consent Order. 1996 (as amended). Agreed to by the State of Nevada, the U.S. Department of Energy, and the U.S. Department of Defense. Las Vegas, NV.

Gilbert, R.O. 1987. *Statistical Methods for Environmental Pollution Monitoring*, Chapter 4. New York, NY: Van Nostrand Reinhold.

NAC, see *Nevada Administrative Code*.

NCRP, See National Council on Radiation Protection and Measurements.

National Council on Radiation Protection and Measurements. 1999. *Recommended Screening Limits for Contaminated Surface Soil and Review of Factors Relevant to Site-Specific Studies*. NCRP Report No. 129. Bethesda MD.

Nevada Administrative Code. 2005. NAC 445A.2272, "Contamination of Soils: Establishment of Action Levels." Carson City, NV.

Stoller-Navarro Joint Venture. 2003. *SNJV Site-Specific Health and Safety Plan, CAU 383: Area 12 E-Tunnel Sites, Nevada Test Site*, Rev. 0. Las Vegas, NV.

U.S. Department of Energy. 1993. "Radiation Protection of the Public and Environment." DOE Order 5400.5 Change 2, 7 January. Washington, DC.

Attachment A

Soil Boring Logs

(96 Pages)

Project Name: CAU 383 E-Tunnel Sites						Date Started: 6/07/04		
Project Number: DT04-320						Date Completed: 6/07/04		
Borehole Number: EDH01						Elevation: 6007.8		
Logged By: M. McLane						Northing: 887739.2		
Drilled By: M. McLane						Easting: 638589.8		
Drilling Method: Hand Sampled						Total Depth: 0.5 ft.		

Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
0-100		0-5							

Contact @ N/A, Sample 383DH0100.5.

Project Name: CAU 383 E-Tunnel Sites Project Number: DT04-320 Borehole Number: EDH02 Logged By: M. McLane Drilled By: M. McLane Drilling Method: Hand Sampled					Date Started: 6/07/04 Date Completed: 6/07/04 Elevation: 6006.8 Northing: 887739.7 Easting: 638599.3 Total Depth: 0.5 ft.				
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
0-100		0-5							
Contact @ N/A, Sample 383DH0200.5.

Project Name: CAU 383 E-Tunnel Sites Project Number: DT04-320 Borehole Number: EDHQ4 Logged By: M. McLane Drilled By: M. McLane Drilling Method: Hand Sampled					Date Started: 6/07/04 Date Completed: 6/07/04 Elevation: 6003.0 Northing: 887734.1 Easting: 638619.8 Total Depth: 0.5 ft.				
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
0-100		0-5							

		Muck: Tan, red, white, and brown FMC sand and gravel with cobbles, dry	0.0	26	4012
-1					
-2					
-3					
-4					
-5					

Project Name: CAU 383 E-Tunnel Sites Project Number: DT04-320 Borehole Number: EDH05 Logged By: M. McLane Drilled By: M. McLane Drilling Method: Hand Sampled					Date Started: 6/07/04 Date Completed: 6/07/04 Elevation: 6003.1 Northing: 887731.5 Easting: 638628.4 Total Depth: 0.5 ft.				
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ N/A, Sample 383DH0500.5.

Project Name: CAU 383 E-Tunnel Sites Project Number: DT04-320 Borehole Number: EDH06 Logged By: M. McLane Drilled By: M. McLane Drilling Method: Hand Sampled					Date Started: 6/07/04 Date Completed: 6/07/04 Elevation: 5998.9 Northing: 887731.2 Easting: 638640.7 Total Depth: 0.5 ft.				
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ N/A, Sample 383DH0600.5.

Project Name: CAU 383 E-Tunnel Sites Project Number: DT04-320 Borehole Number: EDH07 Logged By: M. McLane Drilled By: M. McLane Drilling Method: Hand Sampled					Date Started: 6/07/04 Date Completed: 6/07/04 Elevation: 5997.1 Northing: 887732.0 Easting: 638649.9 Total Depth: 0.5 ft.				
Depth (ft)	Percent Recovery 0-100	Drilling Rate (ft/min) 0-5	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
Contact @ N/A, Samples 383DH0700.5, 383DH0700.5X.

Project Name: CAU 383 E-Tunnel Sites Project Number: DT04-320 Borehole Number: EDH08 Logged By: M. McLane Drilled By: M. McLane Drilling Method: Hand Sampled					Date Started: 6/07/04 Date Completed: 6/07/04 Elevation: 5999.9 Northing: 887729.5 Easting: 638661.1 Total Depth: 0.5 ft.				
Depth (ft)	Percent Recovery 0-100	Drilling Rate (ft/min) 0-5	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
Contact @ N/A, Sample 383DH0800.5.

Project Name: CAU 383 E-Tunnel Sites					Date Started: 6/07/04		
Project Number: DT04-320					Date Completed: 6/07/04		
Borehole Number: EDH09					Elevation: 5997.2		
Logged By: M. McLane					Northing: 887735.5		
Drilled By: M. McLane					Easting: 638678.0		
Drilling Method: Hand Sampled					Total Depth: 0.5 ft.		

Depth (ft)	Percent Recovery 0-100	Drilling Rate (ft/min) 0-5	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
Contact @ N/A, Sample 383DH0900.5.

Project Name: CAU 383 E-Tunnel Sites Project Number: DT04-320 Borehole Number: EDH10 Logged By: M. McLane Drilled By: M. McLane Drilling Method: Hand Sampled					Date Started: 6/07/04 Date Completed: 6/07/04 Elevation: 5995.1 Northing: 887734.2 Easting: 638686.2 Total Depth: 0.5 ft.				
Depth (ft)	Percent Recovery 0-100	Drilling Rate (ft/min) 0-5	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
Contact @ N/A, Sample 383DH1000.5.

Project Name: CAU 383 E-Tunnel Sites Project Number: DT04-320 Borehole Number: EDH11 Logged By: M. McLane Drilled By: M. McLane Drilling Method: Hand Sampled					Date Started: 6/07/04 Date Completed: 6/07/04 Elevation: 5984.3 Northing: 887726.6 Easting: 638697.8 Total Depth: 0.5 ft.				
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ N/A, Sample 383DH1100.5.

Project Name: CAU 383 E-Tunnel Sites Project Number: DT04-320 Borehole Number: EDH13 Logged By: M. McLane Drilled By: M. McLane Drilling Method: Hand Sampled						Date Started: 6/07/04 Date Completed: 6/07/04 Elevation: 5970.7 Northing: 887720.0 Easting: 638737.5 Total Depth: 0.5 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
0-100		0-5							
Contact @ N/A, Sample 383DH1300.5.

Project Name: CAU 383 E-Tunnel Sites					Date Started: 6/07/04		
Project Number: DT04-320					Date Completed: 6/07/04		
Borehole Number: EDH14					Elevation: 5982.0		
Logged By: M. McLane					Northing: 887723.2		
Drilled By: M. McLane					Easting: 638745.4		
Drilling Method: Hand Sampled					Total Depth: 0.5 ft.		

Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
0-100	0-5								

Contact @ N/A, Sample 383DH1400.5.

Project Name: CAU 383 E-Tunnel Sites					Date Started: 6/07/04		
Project Number: DT04-320					Date Completed: 6/07/04		
Borehole Number: EDH15					Elevation: 5976.8		
Logged By: M. McLane					Northing: 887712.1		
Drilled By: M. McLane					Easting: 638759.5		
Drilling Method: Hand Sampled					Total Depth: 0.5 ft.		

Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
0-100	0-5								
Contact @ N/A, Sample 383DH1500.5.

Project Name: CAU 383 E-Tunnel Sites Project Number: DT04-320 Borehole Number: EDH16 Logged By: M. McLane Drilled By: M. McLane Drilling Method: Hand Sampled					Date Started: 6/07/04 Date Completed: 6/07/04 Elevation: 5983.1 Northing: 887711.1 Easting: 638780.1 Total Depth: 0.5 ft.				
Depth (ft)	Percent Recovery 0-100	Drilling Rate (ft/min) 0-5	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
Contact @ N/A, Sample 383DH1600.5.

Project Name: CAU 383 E-Tunnel Sites Project Number: DT04-320 Borehole Number: EDH18 Logged By: M. McLane Drilled By: M. McLane Drilling Method: Hand Sampled						Date Started: 6/07/04 Date Completed: 6/07/04 Elevation: 5977.6 Northing: 887710.6 Easting: 638797.7 Total Depth: 0.5 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
0-100		0-5							
Contact @ N/A, Sample 383DH1800.5.

Project Name: CAU 383 E-Tunnel Sites						Date Started: 6/07/04			
Project Number: DT04-320						Date Completed: 6/07/04			
Borehole Number: EDH20						Elevation: 5972.7			
Logged By: M. McLane						Northing: 887704.0			
Drilled By: M. McLane						Easting: 638818.3			
Drilling Method: Hand Sampled						Total Depth: 0.5 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ N/A, Sample 383DH2000.5.

Project Name: CAU 383 E-Tunnel Sites Project Number: DT04-320 Borehole Number: EDH21 Logged By: M. McLane Drilled By: M. McLane Drilling Method: Hand Sampled						Date Started: 6/15/04 Date Completed: 6/15/04 Elevation: 5976.5 Northing: 887711.5 Easting: 638827.0 Total Depth: 0.5 ft.			
Depth (ft)	Percent Recovery 0-100	Drilling Rate (ft/min) 0-5	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
Contact @ N/A, Sample 383DH2100.5.

Project Name: CAU 383 E-Tunnel Sites Project Number: DT04-320 Borehole Number: EDH22 Logged By: M. McLane Drilled By: M. McLane Drilling Method: Hand Sampled					Date Started: 6/15/04 Date Completed: 6/15/04 Elevation: 5972.0 Northing: 887718.5 Easting: 638836.6 Total Depth: 0.5 ft.				
Depth (ft)	Percent Recovery 0-100	Drilling Rate (ft/min) 0-5	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
Contact @ N/A, Samples 383DH2200.5, 383DH2200.5X.

Project Name: CAU 383 E-Tunnel Sites					Date Started: 6/15/04		
Project Number: DT04-320					Date Completed: 6/15/04		
Borehole Number: EDH23					Elevation: 5976.1		
Logged By: M. McLane					Northing: 887721.1		
Drilled By: M. McLane					Easting: 638844.8		
Drilling Method: Hand Sampled					Total Depth: 0.5 ft.		

Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
0-100		0-5							

Contact @ N/A, Sample 383DH2300.5.

Project Name: CAU 383 E-Tunnel Sites						Date Started: 6/15/04			
Project Number: DT04-320						Date Completed: 6/15/04			
Borehole Number: EDH26						Elevation: 5971.4			
Logged By: M. McLane						Northing: 887720.0			
Drilled By: M. McLane						Easting: 638886.7			
Drilling Method: Hand Sampled						Total Depth: 0.5 ft.			
Depth (ft)	Percent Recovery 0-100	Drilling Rate (ft/min) 0-5	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
Contact @ N/A, Sample 383DH2600.5.

Project Name: CAU 383 E-Tunnel Sites Project Number: DT04-320 Borehole Number: EDH28 Logged By: M. McLane Drilled By: M. McLane Drilling Method: Hand Sampled					Date Started: 6/16/04 Date Completed: 6/16/04 Elevation: 5972.0 Northing: 887722.7 Easting: 638906.4 Total Depth: 0.5 ft.				
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ N/A, Sample 383DH2800.5.

Project Name: CAU 383 E-Tunnel Sites Project Number: DT04-320 Borehole Number: EDH30 Logged By: M. McLane Drilled By: M. McLane Drilling Method: Hand Sampled					Date Started: 6/16/04 Date Completed: 6/16/04 Elevation: 5971.0 Northing: 887722.5 Easting: 638926.3 Total Depth: 0.5 ft.				
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
0-100		0-5							
Contact @ N/A, Sample 383DH3000.5.

Project Name: CAU 383 E-Tunnel Sites Project Number: DT04-320 Borehole Number: EDH31 Logged By: M. McLane Drilled By: M. McLane Drilling Method: Hand Sampled					Date Started: 6/16/04 Date Completed: 6/16/04 Elevation: 5969.6 Northing: 887723.8 Easting: 638935.6 Total Depth: 0.5 ft.				
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ N/A, Sample 383DH3100.5.

[illegible]

Project Name: CAU 383 E-Tunnel Sites					Date Started: 6/16/04		
Project Number: DT04-320					Date Completed: 6/16/04		
Borehole Number: EDH33					Elevation: 5963.7		
Logged By: M. McLane					Northing: 887721.4		
Drilled By: M. McLane					Easting: 638955.9		
Drilling Method: Hand Sampled					Total Depth: 0.5 ft.		

Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
0-100	0-5								

Contact @ N/A, Sample 383DH3300.5.

Project Name: CAU 383 E-Tunnel Sites						Date Started: 6/10/04			
Project Number: DT04-320						Date Completed: 6/10/04			
Borehole Number: EDH34						Elevation: 5964.4			
Logged By: M. McLane						Northing: 887717.9			
Drilled By: Boart-Longyear						Easting: 638966.2			
Drilling Method: Rotosonic						Total Depth: 5.0 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ 4.0 ft, Sample 383DH3400.5.

Project Name: CAU 383 E-Tunnel Sites Project Number: DT04-320 Borehole Number: EDH35 Logged By: M. McLane Drilled By: Boart-Longyear Drilling Method: Rotosonic					Date Started: 6/10/04 Date Completed: 6/10/04 Elevation: 5961.7 Northing: 887712.3 Easting: 638983.2 Total Depth: 5.0 ft.				
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ 4.0 ft, Sample 383DH3500.5.

Project Name: CAU 383 E-Tunnel Sites						Date Started: 6/12/04			
Project Number: DT04-320						Date Completed: 6/12/04			
Borehole Number: EMB01						Elevation: 6123.5			
Logged By: M. McLane						Northing: 887326.5			
Drilled By: Boart-Longyear						Easting: 638886.7			
Drilling Method: Rotosonic						Total Depth: 12.0 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
0-100	0-5								
Contact @ 10 ft, Sample 383MB0100.5.

Project Name: CAU 383 E-Tunnel Sites						Date Started: 5/24/04			
Project Number: DT04-320						Date Completed: 5/24/04			
Borehole Number: EMB02						Elevation: 6136.0			
Logged By: M. McLane						Northing: 887371.8			
Drilled By: Boart-Longyear						Easting: 638013.7			
Drilling Method: Rotosonic						Total Depth: 3.5 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ 1.5 ft, Sample 383MB0200.5.

Project Name: CAU 383 E-Tunnel Sites						Date Started: 6/11/04			
Project Number: DT04-320						Date Completed: 6/11/04			
Borehole Number: EMB03						Elevation: 6121.5			
Logged By: M. McLane						Northing: 887878.1			
Drilled By: Boart-Longyear						Easting: 637712.6			
Drilling Method: Rotosonic						Total Depth: 9.5 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ 1.0 ft, Samples 383MB0300.5, 383MB0305.5.

Project Name: CAU 383 E-Tunnel Sites Project Number: DT04-320 Borehole Number: EMB04 Logged By: M. McLane Drilled By: M. McLane Drilling Method: Hand Sampled					Date Started: 6/01/04 Date Completed: 6/01/04 Elevation: 6119.3 Northing: 887812.1 Easting: 638089.9 Total Depth: 0.5 ft.				
Depth (ft)	Percent Recovery 0-100	Drilling Rate (ft/min) 0-5	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
Contact @ N/A, Sample 383MB0400.5.

Project Name: CAU 383 E-Tunnel Sites						Date Started: 6/02/04			
Project Number: DT04-320						Date Completed: 6/03/04			
Borehole Number: EMB05						Elevation: 6117.8			
Logged By: M. McLane						Northing: 887505.2			
Drilled By: Boart-Longyear						Easting: 638378.0			
Drilling Method: Rotosonic						Total Depth: 86.5 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ 84 ft, Samples 383MB0500.5, 383MB0543.5, 383MB0586.0.

Borehole Number: EMB05									
Depth	% Recovery	Drilling Rate ft/min	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5

Project Name: CAU 383 E-Tunnel Sites						Date Started: 6/12/04			
Project Number: DT04-320						Date Completed: 6/12/04			
Borehole Number: EMB06						Elevation: 6105.0			
Logged By: M. McLane						Northing: 887386.0			
Drilled By: Boart-Longyear						Easting: 638813.1			
Drilling Method: Rotosonic						Total Depth: 7.5 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ 6.0 ft, Samples 383MB0600.5, 383MB0600.5X.

Project Name: CAU 383 E-Tunnel Sites						Date Started: 5/19/04			
Project Number: DTO4-320						Date Completed: 5/19/04			
Borehole Number: EMB07						Elevation: 6123.1			
Logged By: M. McLane						Northing: 888056.7			
Drilled By: Boart-Longyear						Easting: 637580.3			
Drilling Method: Rotosonic						Total Depth: 5.0 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
0-100	0-5								
Contact @ N/A, Sample 383MB0700.5.									

0 -1 -2 -3 -4 -5			383MB0700.5		Muck: Brown and dark red FMC sand and gravel with cobbles, dry	0.0	15	2303 (BKG)
					Muck: Grey sand and gravel, dry (boulder)			
					Muck: Red silt with cobbles, moist	0.0		BKG

Project Name: CAU 383 E-Tunnel Sites						Date Started: 5/24/04			
Project Number: DT04-320						Date Completed: 5/24/04			
Borehole Number: EMB08						Elevation: 6132.5			
Logged By: M. McLane						Northing: 887404.7			
Drilled By: Boart-Longyear						Easting: 638115.3			
Drilling Method: Rotosonic						Total Depth: 31.5 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ 27.0 ft, Samples 383MB0800.5, 383MB0831.0.

Project Name: CAU 383 E-Tunnel Sites						Date Started: 6/12/04		
Project Number: DT04-320						Date Completed: 6/12/04		
Borehole Number: EMB09						Elevation: 6122.3		
Logged By: M. McLane						Northing: 887322.3		
Drilled By: Boart-Longyear						Easting: 638941.3		
Drilling Method: Rotosonic						Total Depth: 14.0 ft.		
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Field Screening Results		
						VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5				Lithologic Description Comments		
Contact @ 13.0 ft, Samples 383MB0900.5, 383MB0912.5, 383MB0913.5.

Project Name: CAU 383 E-Tunnel Sites						Date Started: 6/12/04			
Project Number: DT04-320						Date Completed: 6/12/04			
Borehole Number: EMB10						Elevation: 6102.2			
Logged By: M. McLane						Northing: 887435.4			
Drilled By: Boart-Longyear						Easting: 638844.0			
Drilling Method: Rotosonic						Total Depth: 37.0 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ 26.0 ft, Sample 383MB1000.5.

Project Name: CAU 383 E-Tunnel Sites						Date Started: 6/12/04			
Project Number: DT04-320						Date Completed: 6/12/04			
Borehole Number: EMB11						Elevation: 6107.2			
Logged By: M. McLane						Northing: 887450.5			
Drilled By: Boart-Longyear						Easting: 638781.0			
Drilling Method: Rotasonic						Total Depth: 25.5 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ 15.0 ft, Samples 383MB1100.5, 383MB1114.5, 383MB1119.5.

Project Name: CAU 383 E-Tunnel Sites						Date Started: 6/13/04			
Project Number: DTO4-320						Date Completed: 6/13/04			
Borehole Number: EMB12						Elevation: 6123.1			
Logged By: M. McLane						Northing: 887487.9			
Drilled By: Boart-Longyear						Easting: 638589.1			
Drilling Method: Rotosonic						Total Depth: 75 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ 70.0 ft, Sample 383MB1200.5.									

0				383MB1200.5	Muck: Light brown and red fine sand and gravel with cobbles, dry	0.0	13	2929 (BKG)
-5					Muck: Tan, brown, and white coarse sand and gravel with cobbles, slightly moist	0.0		BKG
-10								
-15						0.0		BKG
-20								
-25					Muck: Red and brown silt, FMC sand, and cobbles, slightly moist	0.0		BKG
-30								
-35					Muck: Brown and white coarse sand and gravel with cobbles, slightly moist. Wood chips and wire at 32 ft.	0.0		BKG
					Muck: Red, tan, and brown coarse sand and cobbles, slightly moist. Wire at 37 and 42 ft.			

Borehole Number: EMB12									
Depth	% Recovery	Drilling Rate ft/min	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5

Project Name: CAU 383 E-Tunnel Sites						Date Started: 6/13/04			
Project Number: DT04-320						Date Completed: 6/13/04			
Borehole Number: EMB13						Elevation: 6127.8			
Logged By: M. McLane						Northing: 887564.0			
Drilled By: Boart-Longyear						Easting: 638432.6			
Drilling Method: Rotosonic						Total Depth: 91.5 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ 90.0 ft, Samples 383MB1300.5, 383MB1391.0.									

0				383MB1300.5	Muck: Brown and white silt, FMC sand and gravel with cobbles, dry	0.0	58	2949 (BKG)
-5					Muck: Tan and white silt, FMC sand and cobbles with some brown and grey boulders, dry	0.0		BKG
-10								
-15						0.0		BKG
-20								
-25					Muck: Brown, red, and white FMC sand and gravel with cobbles, slightly moist	0.0		BKG
-30								
-35					Muck: Grey cobbles, dry (grout)			
-40					Muck: Grey and brown coarse sand and gravel with cobbles, moist	0.0		BKG
-45					Muck: Tan and white coarse sand and gravel with cobbles, moist			
					Muck: Red and white coarse sand and gravel with cobbles, moist			

Borehole Number: EMB13									
Depth	% Recovery	Drilling Rate ft/min	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5

Project Name: CAU 383 E-Tunnel Sites						Date Started: 6/14/04		
Project Number: DT04-320						Date Completed: 6/14/04		
Borehole Number: EMB14						Elevation: 6121.6		
Logged By: M. McLane						Northing: 887672.4		
Drilled By: Boart-Longyear						Easting: 638289.8		
Drilling Method: Rotosonic						Total Depth: 29.0 ft.		
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Field Screening Results		
						VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5						
Contact @ 26.0 ft, Samples 383MB1400.5, 383MB1403.5, 383MB1425.5.

Project Name: CAU 383 E-Tunnel Sites						Date Started: 6/17/04			
Project Number: DTO4-320						Date Completed: 6/17/04			
Borehole Number: EMB15						Elevation: 6119.0			
Logged By: M. McLane						Northing: 887532.7			
Drilled By: M. McLane						Easting: 638461.1			
Drilling Method: Hand Sampled						Total Depth: 0.5 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ N/A, Sample 383MB1500.5.

Project Name: CAU 383 E-Tunnel Sites						Date Started: 5/25/04			
Project Number: DT04-320						Date Completed: 5/25/04			
Borehole Number: EMH01						Elevation: 6128.6			
Logged By: M. McLane						Northing: 887433.7			
Drilled By: Boart-Longyear						Easting: 638265.0			
Drilling Method: Rotasonic						Total Depth: 69.0 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ 65.0 ft, Samples 383MH0136.5, 383MH0168.5.									

0						Muck: Brown and white FMC sand and gravel with plant roots, dry	5.2		BKG
-5						Muck: Tan, red, and white FMC sand and gravel with cobbles, slightly moist	0.0		BKG
-10							0.0		BKG
-15							0.0		BKG
-20						Muck: Dark red and brown silt, FMC sand, and gravel with white and tan cobbles, moist to very moist	0.0		BKG
-25							0.0		BKG
-30							0.0		5000
-35							0.0		9000

Borehole Number: EMH01									
Depth	% Recovery	Drilling Rate ft/min	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5

Project Name: CAU 383 E-Tunnel Sites Project Number: DTO4-320 Borehole Number: EMH02 Logged By: M. McLane Drilled By: Boart-Longyear Drilling Method: Rotosonic					Date Started: 5/22/04 Date Completed: 5/22/04 Elevation: 6118.8 Northing: 887363.7 Easting: 638721.6 Total Depth: 5.0 ft.				
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ N/A, No Samples Taken

Project Name: CAU 383 E-Tunnel Sites						Date Started: 6/03/04			
Project Number: DT04-320						Date Completed: 6/08/04			
Borehole Number: EMH2A						Elevation: 6123.4			
Logged By: M. McLane						Northing: 887540.8			
Drilled By: Boart-Longyear						Easting: 638332.6			
Drilling Method: Rotosonic						Total Depth: 45.5 ft.			
Depth (ft)	Percent Recovery 0-100	Drilling Rate (ft/min) 0-5	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
Contact @ 44.0 ft, Samples 383MH2A08.0, 383MH2A37.5, 383MH2A45.0.

Project Name: CAU 383 E-Tunnel Sites						Date Started: 5/25/04			
Project Number: DT04-320						Date Completed: 5/25/04			
Borehole Number: EMH03						Elevation: 6131.4			
Logged By: M. McLane						Northing: 887442.1			
Drilled By: Boart-Longyear						Easting: 638260.8			
Drilling Method: Rotasonic						Total Depth: 61.5 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ 59.5 ft, Samples 383MH0313.0, 383MH1353.5, 383MH0361.0.

Project Name: CAU 383 E-Tunnel Sites						Date Started: 5/22/04			
Project Number: DT04-320						Date Completed: 5/22/04			
Borehole Number: EMH04						Elevation: 6115.4			
Logged By: M. McLane						Northing: 887429.3			
Drilled By: Boart-Longyear						Easting: 638606.1			
Drilling Method: Rotosonic						Total Depth: 42.0 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ 38.0 ft, Samples 383MH0432.0, 383MH0441.5.

Project Name: CAU 383 E-Tunnel Sites						Date Started: 5/26/04			
Project Number: DT04-320						Date Completed: 5/27/04			
Borehole Number: EMH05						Elevation: 6123.6			
Logged By: M. McLane						Northing: 887462.7			
Drilled By: Boart-Longyear						Easting: 638379.3			
Drilling Method: Rotosonic						Total Depth: 70.0 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ 64.5 ft, Samples 383MH0520.5, 383MH0559.5, 383MH0568.5.

Borehole Number: EMH05									
Depth	% Recovery	Drilling Rate ft/min	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							

-35						Muck: Red, tan, and white coarse sand and gravel with cobbles, moist. Wood chips at 35 ft.	3.7		9000
							0.8		10000
-40						Muck: Dark red FMC sand and cobbles, moist	0.8		7000
						Muck: Red, white, and brown FMC sand and gravel with cobbles, dry	0.0		4000
-45							0.0		5000
							0.0		5000
-50							0.0		5000
-55						Muck: Dark red coarse sand and gravel, slightly moist			
-60				383MH0559.5		Muck: Dark red, brown and black coarse sand and gravel with black cobbles, wood chips, and sheet metal, moist	0.0	7	25200
						Muck: Red, brown, and white coarse sand and gravel with cobbles, very moist	6.0		6000
-65						Native: Grey cobbles and gravel, moist			
				383MH0568.5			0.0	73	2050
-70						No Recovery			

Project Name: CAU 383 E-Tunnel Sites						Date Started: 6/11/04			
Project Number: DT04-320						Date Completed: 6/11/04			
Borehole Number: EMH06						Elevation: 6119.0			
Logged By: M. McLane						Northing: 887897.5			
Drilled By: Boart-Longyear						Easting: 637771.1			
Drilling Method: Rotosonic						Total Depth: 1.5 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ 0.3 ft, Sample 383MH0600.5.

Project Name: CAU 383 E-Tunnel Sites						Date Started: 5/20/04		
Project Number: DT04-320						Date Completed: 5/21/04		
Borehole Number: EMH07						Elevation: 6123.5		
Logged By: M. McLane						Northing: 887475.6		
Drilled By: Boart-Longyear						Easting: 638472.2		
Drilling Method: Rotasonic						Total Depth: 68 ft.		
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Field Screening Results		
						VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5						
Lithologic Description Comments								
Contact @ 59.5 ft, Samples 383MH0722.5, 383MH0723.5, 383MH0767.5.

Borehole Number: EMH07

Depth	% Recovery	Drilling Rate ft/min	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5

Project Name: CAU 383 E-Tunnel Sites						Date Started: 5/26/04			
Project Number: DT04-320						Date Completed: 5/26/04			
Borehole Number: EMH08						Elevation: 6125.9			
Logged By: M. McLane						Northing: 887482.7			
Drilled By: Boart-Longyear						Easting: 638309.3			
Drilling Method: Rotosonic						Total Depth: 59.0 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ 56.0 ft, Samples 383MH0832.5, 383MH0858.0.

Project Name: CAU 383 E-Tunnel Sites						Date Started: 6/11/04			
Project Number: DT04-320						Date Completed: 6/11/04			
Borehole Number: EMH09						Elevation: 6121.9			
Logged By: M. McLane						Northing: 887824.4			
Drilled By: Boart-Longyear						Easting: 637880.4			
Drilling Method: Rotasonic						Total Depth: 25.0 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ 18.0 ft, Samples 383MH0916.5, 383MH0922.5.

Project Name: CAU 383 E-Tunnel Sites						Date Started: 5/22/04			
Project Number: DT04-320						Date Completed: 5/22/04			
Borehole Number: EMH10						Elevation: 6120.8			
Logged By: M. McLane						Northing: 887395.0			
Drilled By: Boart-Longyear						Easting: 638571.8			
Drilling Method: Rotosonic						Total Depth: 20.0 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ 7.0 ft, Samples 383MH1002.0, 383MH1011.5.

Project Name: CAU 383 E-Tunnel Sites						Date Started: 6/11/04		
Project Number: DT04-320						Date Completed: 6/11/04		
Borehole Number: EMH11						Elevation: 6116.5		
Logged By: M. McLane						Northing: 887858.6		
Drilled By: Boart-Longyear						Easting: 637782.5		
Drilling Method: Rotosonic						Total Depth: 4.5 ft.		
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Field Screening Results		
						VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5				Lithologic Description Comments		
Contact @ 1.0 ft, Samples 383MH1100.5, 383MH1104.0.

Project Name: CAU 383 E-Tunnel Sites						Date Started: 5/23/04			
Project Number: DT04-320						Date Completed: 5/23/04			
Borehole Number: EMH12						Elevation: 6124.1			
Logged By: M. McLane						Northing: 887374.4			
Drilled By: Boart-Longyear						Easting: 638473.4			
Drilling Method: Rotosonic						Total Depth: 25.5 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ 16.0 ft, Samples 383MH1215.0, 383MH1220.5.

Project Name: CAU 383 E-Tunnel Sites						Date Started: 5/25/04			
Project Number: DT04-320						Date Completed: 5/25/04			
Borehole Number: EMH13						Elevation: 6136.5			
Logged By: M. McLane						Northing: 887492.0			
Drilled By: Boart-Longyear						Easting: 638209.0			
Drilling Method: Rotosonic						Total Depth: 21.0 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ 20.0 ft, Samples 383MH1306.5, 383MH1320.5.

Project Name: CAU 383 E-Tunnel Sites						Date Started: 5/20/04			
Project Number: DT04-320						Date Completed: 5/20/04			
Borehole Number: EMH14						Elevation: 6129.7			
Logged By: M. McLane						Northing: 887613.0			
Drilled By: Boart-Longyear						Easting: 638322.2			
Drilling Method: Rotasonic						Total Depth: 22.5 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ 19.0 ft, Samples 383MH1407.5, 383MH1422.0.

Project Name: CAU 383 E-Tunnel Sites						Date Started: 5/24/04			
Project Number: DT04-320						Date Completed: 5/24/04			
Borehole Number: EMH15						Elevation: 6133.6			
Logged By: M. McLane						Northing: 887479.0			
Drilled By: Boart-Longyear						Easting: 637912.1			
Drilling Method: Rotosonic						Total Depth: 4.0 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ 2.0 ft, Samples 383MH1501.0, 383MH1503.5, 383MH1503.5X.

Project Name: CAU 383 E-Tunnel Sites						Date Started: 6/11/04			
Project Number: DT04-320						Date Completed: 6/11/04			
Borehole Number: EMH16						Elevation: 6127.8			
Logged By: M. McLane						Northing: 887726.3			
Drilled By: Boart-Longyear						Easting: 638178.0			
Drilling Method: Rotosonic						Total Depth: 19.5 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ 18.0 ft, Samples 383MH1608.5, 383MH1609.5, 383MH1619.0.

Project Name: CAU 383 E-Tunnel Sites						Date Started: 5/21/04			
Project Number: DT04-320						Date Completed: 5/22/04			
Borehole Number: EMH17						Elevation: 6122.8			
Logged By: M. McLane						Northing: 887435.9			
Drilled By: Boart-Longyear						Easting: 638653.1			
Drilling Method: Rotosonic						Total Depth: 36.5 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ 30.0 ft, Samples 383MH1716.5, 383MH1734.5.

Project Name: CAU 383 E-Tunnel Sites						Date Started: 5/23/04			
Project Number: DT04-320						Date Completed: 5/23/04			
Borehole Number: EMH18						Elevation: 6129.9			
Logged By: M. McLane						Northing: 887333.0			
Drilled By: Boart-Longyear						Easting: 638343.0			
Drilling Method: Rotasonic						Total Depth: 12.0 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ 8.5 ft, Samples 383MH1803.5, 383MH1811.5.

Project Name: CAU 383 E-Tunnel Sites Project Number: DT04-320 Borehole Number: EOB01 Logged By: M. McLane Drilled By: M. McLane Drilling Method: Hand Sampled						Date Started: 6/01/04 Date Completed: 6/01/04 Elevation: 6217.6 Northing: 887570.3 Easting: 637635.3 Total Depth: 0.5 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
0-100	0-5								
Contact @ N/A, Sample 383OB0100.5.

Project Name: CAU 383 E-Tunnel Sites Project Number: DT04-320 Borehole Number: EOB02 Logged By: M. McLane Drilled By: M. McLane Drilling Method: Hand Sampled					Date Started: 6/01/04 Date Completed: 6/01/04 Elevation: 6218.0 Northing: 887568.9 Easting: 637641.1 Total Depth: 0.5 ft.				
Depth (ft)	Percent Recovery 0-100	Drilling Rate (ft/min) 0-5	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
Contact @ N/A, Sample 383OB0200.5.

Project Name: CAU 383 E-Tunnel Sites Project Number: DT04-320 Borehole Number: EOB04 Logged By: M. McLane Drilled By: M. McLane Drilling Method: Hand Sampled						Date Started: 6/01/04 Date Completed: 6/01/04 Elevation: 6220.9 Northing: 887535.2 Easting: 637647.3 Total Depth: 0.5 ft.			
Depth (ft)	Percent Recovery 0-100	Drilling Rate (ft/min) 0-5	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
Contact @ N/A, Sample 3830B0400.5.

Project Name: CAU 383 E-Tunnel Sites Project Number: DTO4-320 Borehole Number: EOB05 Logged By: M. McLane Drilled By: M. McLane Drilling Method: Hand Sampled						Date Started: 6/01/04 Date Completed: 6/01/04 Elevation: 6218.2 Northing: 887602.0 Easting: 637630.7 Total Depth: 0.5 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ N/A, Samples 383OB0500.5, 383OB0500.5X.

Project Name: CAU 383 E-Tunnel Sites						Date Started: 6/01/04		
Project Number: DT04-320						Date Completed: 6/01/04		
Borehole Number: EOB06						Elevation: 6212.9		
Logged By: M. McLane						Northing: 887599.8		
Drilled By: M. McLane						Easting: 637658.3		
Drilling Method: Hand Sampled						Total Depth: 0.5 ft.		

Depth (ft)	Percent Recovery 0-100	Drilling Rate (ft/min) 0-5	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
Contact @ N/A, Sample 383OB0600.5.

Project Name: CAU 383 E-Tunnel Sites Project Number: DT04-320 Borehole Number: EOB08 Logged By: M. McLane Drilled By: M. McLane Drilling Method: Hand Sampled					Date Started: 6/01/04 Date Completed: 6/01/04 Elevation: 6220.9 Northing: 887605.2 Easting: 637654.6 Total Depth: 0.5 ft.				
Depth (ft)	Percent Recovery 0-100	Drilling Rate (ft/min) 0-5	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
Contact @ N/A, Sample 3830B0800.5.

Project Name: CAU 383 E-Tunnel Sites						Date Started: 6/10/04		
Project Number: DT04-320						Date Completed: 6/10/04		
Borehole Number: EPB01						Elevation: 5959.0		
Logged By: M. McLane						Northing: 887711.6		
Drilled By: Boart-Longyear						Easting: 639006.6		
Drilling Method: Rotasonic						Total Depth: 5.0 ft.		
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Field Screening Results		
						VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5						
Lithologic Description Comments								
Contact @ 3.5 ft, Samples 383PB0102.0, 383PB0104.5.

Project Name: CAU 383 E-Tunnel Sites Project Number: DT04-320 Borehole Number: EPB02 Logged By: M. McLane Drilled By: M. McLane Drilling Method: Hand Sampled					Date Started: 6/17/04 Date Completed: 6/17/04 Elevation: 5917.5 Northing: 887648.3 Easting: 639275.7 Total Depth: 0.5 ft.				
Depth (ft)	Percent Recovery	Drilling Rate (ft/min) Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results			
						VOCs (ppm)	Alpha (dpm)	Beta (dpm)	
0-100		0-5							
Contact @ N/A, Sample 383PB0200.5.

Project Name: CAU 383 E-Tunnel Sites						Date Started: 6/17/04			
Project Number: DT04-320						Date Completed: 6/17/04			
Borehole Number: EPB03						Elevation: 5927.1			
Logged By: M. McLane						Northing: 887622.8			
Drilled By: M. McLane						Easting: 639329.0			
Drilling Method: Hand Sampled						Total Depth: 0.5 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
0-100		0-5							
Contact @ N/A, Samples 383PB0300.5, 383PB0300.5X.

Project Name: CAU 383 E-Tunnel Sites Project Number: DT04-320 Borehole Number: EPB04 Logged By: M. McLane Drilled By: M. McLane Drilling Method: Hand Sampled					Date Started: 6/16/04 Date Completed: 6/16/04 Elevation: 5942.3 Northing: 887624.5 Easting: 639090.5 Total Depth: 0.5 ft.				
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ N/A, Sample 383PB0400.5.

Project Name: CAU 383 E-Tunnel Sites					Date Started: 6/16/04		
Project Number: DT04-320					Date Completed: 6/16/04		
Borehole Number: EPB05					Elevation: 5935.2		
Logged By: M. McLane					Northing: 887652.8		
Drilled By: M. McLane					Easting: 639152.3		
Drilling Method: Hand Sampled					Total Depth: 0.5 ft.		

Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
0-100		0-5							

Contact @ N/A, Sample 383PB0500.5.

Project Name: CAU 383 E-Tunnel Sites						Date Started: 6/09/04			
Project Number: DT04-320						Date Completed: 6/09/04			
Borehole Number: EPH01						Elevation: 5954.9			
Logged By: M. McLane						Northing: 887706.3			
Drilled By: Boart-Longyear						Easting: 639072.3			
Drilling Method: Rotosonic						Total Depth: 17.0 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ 1.5 ft, Samples 383PH0101.0, 383PH0116.5.

Project Name: CAU 383 E-Tunnel Sites						Date Started: 6/09/04			
Project Number: DT04-320						Date Completed: 6/09/04			
Borehole Number: EPH02						Elevation: 5954.3			
Logged By: M. McLane						Northing: 887666.4			
Drilled By: Boart-Longyear						Easting: 639036.1			
Drilling Method: Rotasonic						Total Depth: 18.0 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ 16.5 ft, Samples 383PH0216.0, 383PH0217.5.

Project Name: CAU 383 E-Tunnel Sites						Date Started: 6/09/04			
Project Number: DT04-320						Date Completed: 6/09/04			
Borehole Number: EPH03						Elevation: 5964.2			
Logged By: M. McLane						Northing: 887668.5			
Drilled By: Boart-Longyear						Easting: 639047.4			
Drilling Method: Rotosonic						Total Depth: 21.0 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ 14.5 ft, Samples 383PH0306.5, 383PH0320.5.

Project Name: CAU 383 E-Tunnel Sites						Date Started: 6/10/04			
Project Number: DT04-320						Date Completed: 6/10/04			
Borehole Number: EPH04						Elevation: 5943.2			
Logged By: M. McLane						Northing: 887678.9			
Drilled By: Boart-Longyear						Easting: 639033.9			
Drilling Method: Rotosonic						Total Depth: 19.0 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
	0-100	0-5							
Contact @ 14.5 ft, Samples 383PH0408.0, 383PH0408.OX, 383PH0418.5.

Project Name: CAU 383 E-Tunnel Sites Project Number: DT04-320 Borehole Number: ERB01 Logged By: M. McLane Drilled By: M. McLane Drilling Method: Hand Sampled						Date Started: 6/01/04 Date Completed: 6/01/04 Elevation: 6122.6 Northing: 887807.9 Easting: 637709.2 Total Depth: 0.5 ft.			
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
0-100		0-5							
Contact @ N/A, Sample 383RB0100.5.

Project Name: CAU 383 E-Tunnel Sites					Date Started: 6/01/04		
Project Number: DT04-320					Date Completed: 6/01/04		
Borehole Number: ERB02					Elevation: 6119.5		
Logged By: M. McLane					Northing: 887818.4		
Drilled By: M. McLane					Easting: 637716.4		
Drilling Method: Hand Sampled					Total Depth: 0.5 ft.		

Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
0-100	0-5								

Contact @ N/A, Sample 383RB0200.5.

Project Name: CAU 383 E-Tunnel Sites Project Number: DT04-320 Borehole Number: ERB03 Logged By: M. McLane Drilled By: M. McLane Drilling Method: Hand Sampled					Date Started: 6/01/04 Date Completed: 6/01/04 Elevation: 6121.3 Northing: 887812.1 Easting: 637728.3 Total Depth: 0.5 ft.				
Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
0-100	0-5								
Contact @ N/A, Sample 383RB0300.5.

Project Name: CAU 383 E-Tunnel Sites					Date Started: 6/01/04		
Project Number: DT04-320					Date Completed: 6/01/04		
Borehole Number: ERB04					Elevation: 6118.6		
Logged By: M. McLane					Northing: 887795.6		
Drilled By: M. McLane					Easting: 637737.4		
Drilling Method: Hand Sampled					Total Depth: 0.5 ft.		

Depth (ft)	Percent Recovery	Drilling Rate (ft/min)	Sample Interval	Sample Number	Lithology	Lithologic Description Comments	Field Screening Results		
							VOCs (ppm)	Alpha (dpm)	Beta (dpm)
0-100		0-5							

Contact @ N/A, Sample 383RB0400.5.

Attachment B

Cross Sections

(6 Pages)

Contour Interval 20 feet
Muckpile Slope

● Sample Location with Number
A Cross Section Line Number

Pond with Pond Number
Edge of Muckpile

Road
Cross Section Line

CAU 383 Muckpile Cross Section Lines

Uncontrolled When Printed

Figure B-2 E-Tunnel Muckpile, Northwest to Southeast
Cross Section A - A'

EMB02 - Borehole and Borehole Number

383MB0200.5 - Sample Number

Muck

Native

2.0 x Vertical Exaggeration

Figure B-3 E-Tunnel Muckpile, West to East
Cross Section B - B'

EMH18 - Borehole and Borehole Number

383MH1803.5 - Sample Number

1.5 x Vertical Exaggeration

Figure B-4 E-Tunnel Muckpile, South to North
Cross Section C - C'

Figure B-5 E-Tunnel Muckpile, South to North
Cross Section D - D'

Figure B-6 E-Tunnel Muckpile, Northwest to Southeast
Cross Section E - E'

Attachment C

Analytical Results Table

(78 Pages)

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383CW01	5/23/2004	water	EPA6010	SMQC	7440-38-2	Arsenic	0.0037	mg/L	B	0.01
383CW01	5/23/2004	water	EPA6010	SMQC	7440-39-3	Barium	0.012	mg/L	B	0.1
383CW01	5/23/2004	water	EPA6010	SMQC	7440-41-7	Beryllium	0.00006	mg/L	B	0.005
383CW01	5/23/2004	water	EPA6010	SMQC	7440-47-3	Chromium	0.0017	mg/L	B	0.01
383CW01	5/23/2004	water	EPA7470	SMQC	7439-97-6	Mercury	0.0000066	mg/L	B	0.0002
383CW01	5/23/2004	water	EPA6010	SMQC	7440-22-4	Silver	0.0017	mg/L	B	0.01
383CW02	5/23/2004	water	EPA8260	ER	67-64-1	Acetone	22	µg/L		20
383CW02	5/23/2004	water	EPA6010	ER	7440-38-2	Arsenic	0.019	mg/L		0.01
383CW02	5/23/2004	water	EPA6010	ER	7440-39-3	Barium	0.0047	mg/L	B	0.1
383CW02	5/23/2004	water	EPA8270	ER	117-81-7	Bis(2-Ethylhexyl)Phthalate	15	µg/L		9.5
383CW02	5/23/2004	water	EPA7470	ER	7439-97-6	Mercury	0.000007	mg/L	B	0.0002
383CW02	5/23/2004	water	EPA6010	ER	7440-22-4	Silver	0.0015	mg/L	B	0.01
383CW03	5/24/2004	water	EPA8260	FB	67-64-1	Acetone	9.8	µg/L	J	20
383CW03	5/24/2004	water	EPA6010	FB	7440-41-7	Beryllium	0.00009	mg/L	B	0.005
383CW03	5/24/2004	water	EPA8270	FB	117-81-7	Bis(2-Ethylhexyl)Phthalate	5.9	µg/L	J	9.7
383CW03	5/24/2004	water	EPA7470	FB	7439-97-6	Mercury	0.0000097	mg/L	B	0.0002
383CW04	6/1/2004	water	EPA8270	FB	117-81-7	Bis(2-Ethylhexyl)Phthalate	16	µg/L		11
383CW04	6/1/2004	water	EPA6010	FB	7440-22-4	Silver	0.00068	mg/L	B	0.01
383CW05	6/1/2004	water	EPA8260	ER	67-64-1	Acetone	8.4	µg/L	J	20
383CW05	6/1/2004	water	EPA8270	ER	117-81-7	Bis(2-Ethylhexyl)Phthalate	17	µg/L		9.5
383CW05	6/1/2004	water	EPA6010	ER	7782-49-2	Selenium	0.0024	mg/L	B	0.005
383CW06	6/7/2004	water	EPA8270	FB	117-81-7	Bis(2-Ethylhexyl)Phthalate	8.8	µg/L	J	9.6
383CW06	6/7/2004	water	EPA6010	FB	7440-22-4	Silver	0.00094	mg/L	B	0.01
383CW07	6/7/2004	water	EPA8260	ER	67-64-1	Acetone	6.9	µg/L	J	20
383CW07	6/7/2004	water	EPA6010	ER	7440-39-3	Barium	0.0016	mg/L	B	0.1
383CW07	6/7/2004	water	EPA8270	ER	117-81-7	Bis(2-Ethylhexyl)Phthalate	7.4	µg/L	J	9.6
383CW07	6/7/2004	water	EPA8260	ER	74-87-3	Chloromethane	0.58	µg/L	J	10
383CW08	6/10/2004	water	EPA8260	FB	67-64-1	Acetone	25	µg/L	B	20
383CW08	6/10/2004	water	EPA8270	FB	117-81-7	Bis(2-Ethylhexyl)Phthalate	6.5	µg/L	J	9.6
383CW08	6/10/2004	water	EPA7470	FB	7439-97-6	Mercury	0.0000032	mg/L	B	0.0002
383CW09	6/10/2004	water	EPA8260	ER	67-64-1	Acetone	20	µg/L	B	20
383CW09	6/10/2004	water	EPA8270	ER	117-81-7	Bis(2-Ethylhexyl)Phthalate	10	µg/L		9.6
383CW09	6/10/2004	water	EPA6010	ER	7440-43-9	Cadmium	0.00018	mg/L	B	0.005
383CW09	6/10/2004	water	EPA7470	ER	7439-97-6	Mercury	0.0000035	mg/L	B	0.0002
383CW09	6/10/2004	water	EPA6010	ER	7440-22-4	Silver	0.00066	mg/L	B	0.01

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383CW10	6/12/2004	water	EPA8270	FB	117-81-7	Bis(2-Ethylhexyl)Phthalate	26	µg/L		9.6
383CW10	6/12/2004	water	EPA8260	FB	75-09-2	Methylene Chloride	0.79	µg/L	J	5
383CW11	6/12/2004	water	EPA6010	ER	7440-39-3	Barium	0.005	mg/L	B	0.1
383CW11	6/12/2004	water	EPA8270	ER	117-81-7	Bis(2-Ethylhexyl)Phthalate	42	µg/L		9.6
383CW11	6/12/2004	water	EPA7470	ER	7439-97-6	Mercury	0.0000042	mg/L	B	0.0002
383CW11	6/12/2004	water	EPA8260	ER	75-09-2	Methylene Chloride	0.75	µg/L	J	5
383CW12	6/16/2004	water	EPA8270	FB	117-81-7	Bis(2-Ethylhexyl)Phthalate	6	µg/L	J	9.5
383CW12	6/16/2004	water	EPA7470	FB	7439-97-6	Mercury	0.00003	mg/L	B	0.0002
383CW12	6/16/2004	water	EPA8260	FB	75-09-2	Methylene Chloride	1.6	µg/L	J	5
383CW13	6/16/2004	water	EPA6010	ER	7440-39-3	Barium	0.00049	mg/L	B	0.1
383CW13	6/16/2004	water	EPA8270	ER	117-81-7	Bis(2-Ethylhexyl)Phthalate	24	µg/L		9.6
383CW13	6/16/2004	water	EPA8260	ER	74-87-3	Chloromethane	0.71	µg/L	J	10
383CW13	6/16/2004	water	EPA7470	ER	7439-97-6	Mercury	0.00003	mg/L	B	0.0002
383CW13	6/16/2004	water	EPA8260	ER	75-09-2	Methylene Chloride	1.4	µg/L	J	5
383CW13	6/16/2004	water	EPA6010	ER	7440-22-4	Silver	0.00087	mg/L	B	0.01
383CW14	6/17/2004	water	EPA8270	FB	117-81-7	Bis(2-Ethylhexyl)Phthalate	10	µg/L		9.5
383CW14	6/17/2004	water	EPA7470	FB	7439-97-6	Mercury	0.00003	mg/L	B	0.0002
383CW14	6/17/2004	water	EPA8260	FB	75-09-2	Methylene Chloride	1.5	µg/L	J	5
383CW15	6/17/2004	water	EPA6010	ER	7440-39-3	Barium	0.013	mg/L	B	0.1
383CW15	6/17/2004	water	EPA8270	ER	117-81-7	Bis(2-Ethylhexyl)Phthalate	18	µg/L		9.6
383CW15	6/17/2004	water	EPA7470	ER	7439-97-6	Mercury	0.00003	mg/L	B	0.0002
383CW15	6/17/2004	water	EPA8260	ER	75-09-2	Methylene Chloride	1.3	µg/L	J	5
383CW15	6/17/2004	water	EPA6010	ER	7440-22-4	Silver	0.00069	mg/L	B	0.01
383DH0100.5	6/7/2004	soil	HASL300	REG	14331-83-0	Ac-228	2.21	pCi/g	G	0.68
383DH0100.5	6/7/2004	soil	EPA6010	REG	7440-38-2	Arsenic	2.3	mg/kg		1
383DH0100.5	6/7/2004	soil	EPA6010	REG	7440-39-3	Barium	750	mg/kg		10
383DH0100.5	6/7/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.3	mg/kg		0.52
383DH0100.5	6/7/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.24	pCi/g	G,J	0.46
383DH0100.5	6/7/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.14	mg/kg	B	0.52
383DH0100.5	6/7/2004	soil	EPA6010	REG	7440-47-3	Chromium	1.1	mg/kg		1
383DH0100.5	6/7/2004	soil	HASL300	REG	10045-97-3	Cs-137	34.4	pCi/g	G	0.2
383DH0100.5	6/7/2004	soil	HASL300	REG	13966-00-2	K-40	34.5	pCi/g	G	1.9
383DH0100.5	6/7/2004	soil	EPA6010	REG	7439-92-1	Lead	20	mg/kg		0.31
383DH0100.5	6/7/2004	soil	EPA8260	REG	136777-61-2	M+P-Xylene	2.1	µg/L	J	5.2
383DH0100.5	6/7/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.01	mg/kg	B	0.1

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383DH0100.5	6/7/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	0.83	µg/L	J	5.2
383DH0100.5	6/7/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.51	pCi/g	J	0.41
383DH0100.5	6/7/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.41	pCi/g	G,J	0.55
383DH0100.5	6/7/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.73	pCi/g		0.02
383DH0100.5	6/7/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	3.03	pCi/g	J	0.01
383DH0100.5	6/7/2004	soil	SR7500	REG	10098-97-2	Sr-90	1.88	pCi/g		0.24
383DH0100.5	6/7/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.71	pCi/g	G	0.22
383DH0200.5	6/7/2004	soil	EPA8260	REG	78-93-3	2-Butanone	10	µg/kg	J	21
383DH0200.5	6/7/2004	soil	HASL300	REG	14331-83-0	Ac-228	2.26	pCi/g	G	0.71
383DH0200.5	6/7/2004	soil	EPA8260	REG	67-64-1	Acetone	39	µg/kg		21
383DH0200.5	6/7/2004	soil	HASL300	REG	14596-10-2	Am-241	1.88	pCi/g	J	0.48
383DH0200.5	6/7/2004	soil	EPA6010	REG	7440-38-2	Arsenic	2.6	mg/kg		1
383DH0200.5	6/7/2004	soil	EPA6010	REG	7440-39-3	Barium	3100	mg/kg		100
383DH0200.5	6/7/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.2	mg/kg		0.51
383DH0200.5	6/7/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.27	pCi/g	G,J	0.47
383DH0200.5	6/7/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.16	mg/kg	B	0.51
383DH0200.5	6/7/2004	soil	EPA6010	REG	7440-47-3	Chromium	2.6	mg/kg		1
383DH0200.5	6/7/2004	soil	HASL300	REG	10045-97-3	Cs-137	45.8	pCi/g	G	0.2
383DH0200.5	6/7/2004	soil	EPA8260	REG	100-41-4	Ethylbenzene	3.1	µg/kg	J	5.1
383DH0200.5	6/7/2004	soil	HASL300	REG	13966-00-2	K-40	31.8	pCi/g	G	2.2
383DH0200.5	6/7/2004	soil	EPA6010	REG	7439-92-1	Lead	15	mg/kg		0.31
383DH0200.5	6/7/2004	soil	EPA8260	REG	136777-61-2	M+P-Xylene	18	µg/kg		5.1
383DH0200.5	6/7/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.015	mg/kg	B	0.1
383DH0200.5	6/7/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	4	µg/kg	J	5.1
383DH0200.5	6/7/2004	soil	EPA8260	REG	95-47-6	O-Xylene	6.7	µg/kg		5.1
383DH0200.5	6/7/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.42	pCi/g	J	0.44
383DH0200.5	6/7/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.4	pCi/g	G,J	0.58
383DH0200.5	6/7/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.156	pCi/g		0.029
383DH0200.5	6/7/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	1.46	pCi/g	J	0.02
383DH0200.5	6/7/2004	soil	SR7500	REG	10098-97-2	Sr-90	1.23	pCi/g	Y1	0.22
383DH0200.5	6/7/2004	soil	EPA8260	REG	100-42-5	Styrene	1.2	µg/kg	J	5.1
383DH0200.5	6/7/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.7	pCi/g	G	0.24
383DH0200.5	6/7/2004	soil	EPA8260	REG	108-88-3	Toluene	1.4	µg/kg	J	5.1
383DH0300.5	6/7/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.91	pCi/g	G	0.53
383DH0300.5	6/7/2004	soil	EPA8260	REG	67-64-1	Acetone	18	µg/kg	J	20

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383DH0300.5	6/7/2004	soil	EPA6010	REG	7440-38-2	Arsenic	2.7	mg/kg		1
383DH0300.5	6/7/2004	soil	EPA6010	REG	7440-39-3	Barium	2800	mg/kg		100
383DH0300.5	6/7/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.6	mg/kg		0.51
383DH0300.5	6/7/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.32	pCi/g	G,J	0.31
383DH0300.5	6/7/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.16	mg/kg	B	0.51
383DH0300.5	6/7/2004	soil	EPA6010	REG	7440-47-3	Chromium	3.9	mg/kg		1
383DH0300.5	6/7/2004	soil	HASL300	REG	10045-97-3	Cs-137	3.72	pCi/g	G	0.15
383DH0300.5	6/7/2004	soil	EPA8260	REG	100-41-4	Ethylbenzene	11	µg/kg		5.1
383DH0300.5	6/7/2004	soil	HASL300	REG	13966-00-2	K-40	27.6	pCi/g	G	1.5
383DH0300.5	6/7/2004	soil	EPA6010	REG	7439-92-1	Lead	17	mg/kg		0.31
383DH0300.5	6/7/2004	soil	EPA8260	REG	136777-61-2	M+P-Xylene	57	µg/kg		5.1
383DH0300.5	6/7/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.0088	mg/kg	B	0.1
383DH0300.5	6/7/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	3.1	µg/kg	J	5.1
383DH0300.5	6/7/2004	soil	EPA8260	REG	95-47-6	O-Xylene	23	µg/kg		5.1
383DH0300.5	6/7/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.08	pCi/g	J	0.25
383DH0300.5	6/7/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.21	pCi/g	G,J	0.26
383DH0300.5	6/7/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.186	pCi/g	J	0.025
383DH0300.5	6/7/2004	soil	EPA8260	REG	100-42-5	Styrene	3.6	µg/kg	J	5.1
383DH0300.5	6/7/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.58	pCi/g	G	0.14
383DH0300.5	6/7/2004	soil	EPA8260	REG	108-88-3	Toluene	1.4	µg/kg	J	5.1
383DH0400.5	6/7/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.8	pCi/g	G	0.56
383DH0400.5	6/7/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3.1	mg/kg		1
383DH0400.5	6/7/2004	soil	EPA6010	REG	7440-39-3	Barium	3300	mg/kg		100
383DH0400.5	6/7/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.6	mg/kg		0.52
383DH0400.5	6/7/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.33	pCi/g	G,J	0.35
383DH0400.5	6/7/2004	soil	EPA8270	REG	85-68-7	Butyl Benzyl Phthalate	33	µg/kg	J	350
383DH0400.5	6/7/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.17	mg/kg	B	0.52
383DH0400.5	6/7/2004	soil	EPA6010	REG	7440-47-3	Chromium	4.3	mg/kg		1
383DH0400.5	6/7/2004	soil	HASL300	REG	10045-97-3	Cs-137	3.86	pCi/g	G	0.18
383DH0400.5	6/7/2004	soil	HASL300	REG	13966-00-2	K-40	30.8	pCi/g	G	1.8
383DH0400.5	6/7/2004	soil	EPA6010	REG	7439-92-1	Lead	17	mg/kg		0.31
383DH0400.5	6/7/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.012	mg/kg	B	0.1
383DH0400.5	6/7/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	1.8	µg/kg	J	5.2
383DH0400.5	6/7/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.78	pCi/g	J	0.29
383DH0400.5	6/7/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.4	pCi/g	G,J	0.3

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383DH0400.5	6/7/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.063	pCi/g		0.009
383DH0400.5	6/7/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.5	pCi/g	J	0.02
383DH0400.5	6/7/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.65	pCi/g	G	0.17
383DH0500.5	6/7/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.85	pCi/g	G	0.56
383DH0500.5	6/7/2004	soil	EPA8260	REG	67-64-1	Acetone	23	µg/kg		20
383DH0500.5	6/7/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3	mg/kg		1
383DH0500.5	6/7/2004	soil	EPA6010	REG	7440-39-3	Barium	3200	mg/kg		100
383DH0500.5	6/7/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.7	mg/kg		0.51
383DH0500.5	6/7/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.41	pCi/g	G,J	0.37
383DH0500.5	6/7/2004	soil	EPA8270	REG	85-68-7	Butyl Benzyl Phthalate	40	µg/kg	J	340
383DH0500.5	6/7/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.19	mg/kg	B	0.51
383DH0500.5	6/7/2004	soil	EPA6010	REG	7440-47-3	Chromium	3.6	mg/kg		1
383DH0500.5	6/7/2004	soil	HASL300	REG	10045-97-3	Cs-137	7.21	pCi/g	G	0.15
383DH0500.5	6/7/2004	soil	EPA8260	REG	100-41-4	Ethylbenzene	8.2	µg/kg		5.1
383DH0500.5	6/7/2004	soil	HASL300	REG	13966-00-2	K-40	27.9	pCi/g	G	2.1
383DH0500.5	6/7/2004	soil	EPA6010	REG	7439-92-1	Lead	25	mg/kg		0.31
383DH0500.5	6/7/2004	soil	EPA8260	REG	136777-61-2	M+P-Xylene	42	µg/kg		5.1
383DH0500.5	6/7/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.011	mg/kg	B	0.1
383DH0500.5	6/7/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	2.2	µg/kg	J	5.1
383DH0500.5	6/7/2004	soil	EPA8260	REG	95-47-6	O-Xylene	15	µg/kg		5.1
383DH0500.5	6/7/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.26	pCi/g	J	0.26
383DH0500.5	6/7/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.25	pCi/g	G,J	0.31
383DH0500.5	6/7/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.064	pCi/g		0.018
383DH0500.5	6/7/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.57	pCi/g	J	0.01
383DH0500.5	6/7/2004	soil	SR7500	REG	10098-97-2	Sr-90	0.49	pCi/g	LT	0.28
383DH0500.5	6/7/2004	soil	EPA8260	REG	100-42-5	Styrene	0.99	µg/kg	J	5.1
383DH0500.5	6/7/2004	soil	HASL300	REG	15065-10-8	Th-234	2.4	pCi/g	J	2.1
383DH0500.5	6/7/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.67	pCi/g	G	0.18
383DH0500.5	6/7/2004	soil	EPA8260	REG	108-88-3	Toluene	1.6	µg/kg	J	5.1
383DH0600.5	6/7/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.79	pCi/g	G	0.7
383DH0600.5	6/7/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3.5	mg/kg		1
383DH0600.5	6/7/2004	soil	EPA6010	REG	7440-39-3	Barium	3500	mg/kg		100
383DH0600.5	6/7/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.4	mg/kg		0.52
383DH0600.5	6/7/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.94	pCi/g	G,J	0.34
383DH0600.5	6/7/2004	soil	EPA8270	REG	117-81-7	Bis(2-Ethylhexyl)Phthalate	100	µg/kg	J	350

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383DH0600.5	6/7/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.23	mg/kg	B	0.52
383DH0600.5	6/7/2004	soil	EPA6010	REG	7440-47-3	Chromium	4.1	mg/kg		1
383DH0600.5	6/7/2004	soil	HASL300	REG	10045-97-3	Cs-137	18.4	pCi/g	G	0.2
383DH0600.5	6/7/2004	soil	EPA8260	REG	100-41-4	Ethylbenzene	1.6	µg/kg	J	5.2
383DH0600.5	6/7/2004	soil	HASL300	REG	13966-00-2	K-40	26.7	pCi/g	G	2.1
383DH0600.5	6/7/2004	soil	EPA6010	REG	7439-92-1	Lead	22	mg/kg		0.31
383DH0600.5	6/7/2004	soil	EPA8260	REG	136777-61-2	M+P-Xylene	5.9	µg/kg		5.2
383DH0600.5	6/7/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.019	mg/kg	B	0.1
383DH0600.5	6/7/2004	soil	EPA8260	REG	95-47-6	O-Xylene	1.6	µg/kg	J	5.2
383DH0600.5	6/7/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.54	pCi/g	J	0.31
383DH0600.5	6/7/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.44	pCi/g	G,J	0.42
383DH0600.5	6/7/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.133	pCi/g		0.009
383DH0600.5	6/7/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.8	pCi/g	J	0.02
383DH0600.5	6/7/2004	soil	SR7500	REG	10098-97-2	Sr-90	0.91	pCi/g	Y1	0.25
383DH0600.5	6/7/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.67	pCi/g	G	0.19
383DH0700.5	6/7/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.73	pCi/g	G	0.47
383DH0700.5	6/7/2004	soil	EPA6010	REG	7440-38-2	Arsenic	2.7	mg/kg		1
383DH0700.5	6/7/2004	soil	EPA6010	REG	7440-39-3	Barium	2500	mg/kg		100
383DH0700.5	6/7/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.6	mg/kg		0.51
383DH0700.5	6/7/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.25	pCi/g	G,J	0.28
383DH0700.5	6/7/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.27	mg/kg	B	0.51
383DH0700.5	6/7/2004	soil	EPA6010	REG	7440-47-3	Chromium	2.8	mg/kg		1
383DH0700.5	6/7/2004	soil	HASL300	REG	10045-97-3	Cs-137	2.72	pCi/g	G	0.12
383DH0700.5	6/7/2004	soil	HASL300	REG	13966-00-2	K-40	25.4	pCi/g	G	1.5
383DH0700.5	6/7/2004	soil	EPA6010	REG	7439-92-1	Lead	22	mg/kg		0.31
383DH0700.5	6/7/2004	soil	EPA8260	REG	136777-61-2	M+P-Xylene	2.5	µg/kg	J	5.1
383DH0700.5	6/7/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.014	mg/kg	B	0.1
383DH0700.5	6/7/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	1.6	µg/kg	J	5.1
383DH0700.5	6/7/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.82	pCi/g	J	0.23
383DH0700.5	6/7/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.49	pCi/g	G,J	0.31
383DH0700.5	6/7/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.071	pCi/g	J	0.016
383DH0700.5	6/7/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.65	pCi/g	G	0.13
383DH0700.5X	6/7/2004	soil	HASL300	FD	14331-83-0	Ac-228	1.92	pCi/g	G	0.63
383DH0700.5X	6/7/2004	soil	EPA8260	FD	67-64-1	Acetone	11	µg/kg	J	20
383DH0700.5X	6/7/2004	soil	EPA6010	FD	7440-38-2	Arsenic	2.2	mg/kg		1

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383DH0700.5X	6/7/2004	soil	EPA6010	FD	7440-39-3	Barium	2500	mg/kg		100
383DH0700.5X	6/7/2004	soil	EPA6010	FD	7440-41-7	Beryllium	1.7	mg/kg		0.51
383DH0700.5X	6/7/2004	soil	HASL300	FD	14733-03-0	Bi-214	1.36	pCi/g	G,J	0.23
383DH0700.5X	6/7/2004	soil	EPA6010	FD	7440-43-9	Cadmium	0.23	mg/kg	B	0.51
383DH0700.5X	6/7/2004	soil	EPA6010	FD	7440-47-3	Chromium	2.9	mg/kg		1
383DH0700.5X	6/7/2004	soil	HASL300	FD	10045-97-3	Cs-137	2.78	pCi/g	G	0.16
383DH0700.5X	6/7/2004	soil	HASL300	FD	13966-00-2	K-40	25.9	pCi/g	G	1.6
383DH0700.5X	6/7/2004	soil	EPA6010	FD	7439-92-1	Lead	18	mg/kg		0.31
383DH0700.5X	6/7/2004	soil	EPA7470	FD	7439-97-6	Mercury	0.014	mg/kg	B	0.1
383DH0700.5X	6/7/2004	soil	EPA8260	FD	75-09-2	Methylene Chloride	1.9	µg/kg	J	5.1
383DH0700.5X	6/7/2004	soil	HASL300	FD	15092-94-1	Pb-212	2.22	pCi/g	J	0.21
383DH0700.5X	6/7/2004	soil	HASL300	FD	15067-28-4	Pb-214	1.2	pCi/g	G,J	0.26
383DH0700.5X	6/7/2004	soil	EPA6010	FD	7782-49-2	Selenium	0.54	mg/kg		0.51
383DH0700.5X	6/7/2004	soil	HASL300	FD	14913-50-9	Tl-208	0.57	pCi/g	G	0.14
383DH0800.5	6/7/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.72	pCi/g	G	0.48
383DH0800.5	6/7/2004	soil	EPA6010	REG	7440-38-2	Arsenic	4	mg/kg		1
383DH0800.5	6/7/2004	soil	EPA6010	REG	7440-39-3	Barium	3900	mg/kg		100
383DH0800.5	6/7/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.4	mg/kg		0.51
383DH0800.5	6/7/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.33	pCi/g	G,J	0.39
383DH0800.5	6/7/2004	soil	EPA8270	REG	117-81-7	Bis(2-Ethylhexyl)Phthalate	200	µg/kg	J	340
383DH0800.5	6/7/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.28	mg/kg	B	0.51
383DH0800.5	6/7/2004	soil	EPA6010	REG	7440-47-3	Chromium	3.9	mg/kg		1
383DH0800.5	6/7/2004	soil	HASL300	REG	10045-97-3	Cs-137	12.4	pCi/g	G	0.2
383DH0800.5	6/7/2004	soil	HASL300	REG	13966-00-2	K-40	30.9	pCi/g	G	1.6
383DH0800.5	6/7/2004	soil	EPA6010	REG	7439-92-1	Lead	22	mg/kg		0.31
383DH0800.5	6/7/2004	soil	EPA8260	REG	136777-61-2	M+P-Xylene	3	µg/kg	J	5.1
383DH0800.5	6/7/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.028	mg/kg	B	0.1
383DH0800.5	6/7/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	1.9	µg/kg	J	5.1
383DH0800.5	6/7/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.17	pCi/g	J	0.31
383DH0800.5	6/7/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.16	pCi/g	G,J	0.4
383DH0800.5	6/7/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.059	pCi/g		0.009
383DH0800.5	6/7/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	1.87	pCi/g	J	0.01
383DH0800.5	6/7/2004	soil	SR7500	REG	10098-97-2	Sr-90	0.55	pCi/g	Y1	0.25
383DH0800.5	6/7/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.6	pCi/g	G	0.17
383DH0800.5	6/7/2004	soil	EPA8260	REG	108-88-3	Toluene	1	µg/kg	J	5.1

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383DH0900.5	6/7/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.7	pCi/g	G	0.69
383DH0900.5	6/7/2004	soil	EPA8260	REG	67-64-1	Acetone	9.3	µg/kg	J,B	21
383DH0900.5	6/7/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3.2	mg/kg		1
383DH0900.5	6/7/2004	soil	EPA6010	REG	7440-39-3	Barium	3500	mg/kg		100
383DH0900.5	6/7/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.2	mg/kg		0.52
383DH0900.5	6/7/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.86	pCi/g	G,J	0.38
383DH0900.5	6/7/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.21	mg/kg	B	0.52
383DH0900.5	6/7/2004	soil	EPA6010	REG	7440-47-3	Chromium	2.9	mg/kg		1
383DH0900.5	6/7/2004	soil	HASL300	REG	10045-97-3	Cs-137	48.7	pCi/g	G	0.2
383DH0900.5	6/7/2004	soil	HASL300	REG	13966-00-2	K-40	30.3	pCi/g	G	1.5
383DH0900.5	6/7/2004	soil	EPA6010	REG	7439-92-1	Lead	52	mg/kg		0.31
383DH0900.5	6/7/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.021	mg/kg	B	0.1
383DH0900.5	6/7/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.71	pCi/g	J	0.5
383DH0900.5	6/7/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.201	pCi/g		0.011
383DH0900.5	6/7/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	1.17	pCi/g		0.01
383DH0900.5	6/7/2004	soil	SR7500	REG	10098-97-2	Sr-90	0.92	pCi/g	Y1	0.22
383DH0900.5	6/7/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.71	pCi/g	G	0.24
383DH1000.5	6/7/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.37	pCi/g	G	0.51
383DH1000.5	6/7/2004	soil	EPA8260	REG	67-64-1	Acetone	6.2	µg/kg	J,B	21
383DH1000.5	6/7/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3	mg/kg		1
383DH1000.5	6/7/2004	soil	EPA6010	REG	7440-39-3	Barium	3800	mg/kg		100
383DH1000.5	6/7/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.2	mg/kg		0.51
383DH1000.5	6/7/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.85	pCi/g	G,J	0.33
383DH1000.5	6/7/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.15	mg/kg	B	0.51
383DH1000.5	6/7/2004	soil	EPA6010	REG	7440-47-3	Chromium	5.1	mg/kg		1
383DH1000.5	6/7/2004	soil	HASL300	REG	10045-97-3	Cs-137	23.7	pCi/g	G	0.2
383DH1000.5	6/7/2004	soil	HASL300	REG	13966-00-2	K-40	21.6	pCi/g	G	1.2
383DH1000.5	6/7/2004	soil	EPA6010	REG	7439-92-1	Lead	22	mg/kg		0.31
383DH1000.5	6/7/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.027	mg/kg	B	0.1
383DH1000.5	6/7/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	3.4	µg/kg	J	5.1
383DH1000.5	6/7/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.57	pCi/g	J	0.33
383DH1000.5	6/7/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.08	pCi/g	G,J	0.47
383DH1000.5	6/7/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.176	pCi/g		0.009
383DH1000.5	6/7/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	1.26	pCi/g		0.02
383DH1000.5	6/7/2004	soil	SR7500	REG	10098-97-2	Sr-90	0.96	pCi/g		0.23

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383DH1000.5	6/7/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.47	pCi/g	G	0.2
383DH1100.5	6/7/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.95	pCi/g	G	0.46
383DH1100.5	6/7/2004	soil	EPA6010	REG	7440-38-2	Arsenic	2.2	mg/kg		1
383DH1100.5	6/7/2004	soil	EPA6010	REG	7440-39-3	Barium	2900	mg/kg		100
383DH1100.5	6/7/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.7	mg/kg		0.51
383DH1100.5	6/7/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.98	pCi/g	G,J	0.31
383DH1100.5	6/7/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.13	mg/kg	B	0.51
383DH1100.5	6/7/2004	soil	EPA6010	REG	7440-47-3	Chromium	4.3	mg/kg		1
383DH1100.5	6/7/2004	soil	HASL300	REG	10045-97-3	Cs-137	7.52	pCi/g	G	0.16
383DH1100.5	6/7/2004	soil	HASL300	REG	13966-00-2	K-40	26.3	pCi/g	G	1.2
383DH1100.5	6/7/2004	soil	EPA6010	REG	7439-92-1	Lead	23	mg/kg		0.31
383DH1100.5	6/7/2004	soil	EPA8260	REG	136777-61-2	M+P-Xylene	2.1	µg/kg	J	5.1
383DH1100.5	6/7/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.014	mg/kg	B	0.1
383DH1100.5	6/7/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	2.9	µg/kg	J	5.1
383DH1100.5	6/7/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.23	pCi/g	J	0.26
383DH1100.5	6/7/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.33	pCi/g	G,J	0.32
383DH1100.5	6/7/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.048	pCi/g	LT	0.01
383DH1100.5	6/7/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.7	pCi/g		0.02
383DH1100.5	6/7/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.66	pCi/g	G	0.16
383DH1200.5	6/7/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.75	pCi/g	G	0.69
383DH1200.5	6/7/2004	soil	EPA8260	REG	67-64-1	Acetone	6.3	µg/kg	J,B	21
383DH1200.5	6/7/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3.2	mg/kg		1
383DH1200.5	6/7/2004	soil	EPA6010	REG	7440-39-3	Barium	3600	mg/kg		100
383DH1200.5	6/7/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.5	mg/kg		0.52
383DH1200.5	6/7/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.17	pCi/g	G,J	0.54
383DH1200.5	6/7/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.16	mg/kg	B	0.52
383DH1200.5	6/7/2004	soil	EPA6010	REG	7440-47-3	Chromium	5	mg/kg		1
383DH1200.5	6/7/2004	soil	HASL300	REG	10045-97-3	Cs-137	33.8	pCi/g	G	0.3
383DH1200.5	6/7/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	2.7	mg/kg	J	5.2
383DH1200.5	6/7/2004	soil	HASL300	REG	13966-00-2	K-40	24.1	pCi/g	G	2.3
383DH1200.5	6/7/2004	soil	EPA6010	REG	7439-92-1	Lead	36	mg/kg		0.31
383DH1200.5	6/7/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.049	mg/kg	B	0.1
383DH1200.5	6/7/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	2.5	µg/kg	J	5.2
383DH1200.5	6/7/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.42	pCi/g	J	0.45
383DH1200.5	6/7/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.31	pCi/g	G,J	0.69

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383DH1200.5	6/7/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.136	pCi/g		0.022
383DH1200.5	6/7/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	1.54	pCi/g		0.02
383DH1200.5	6/7/2004	soil	SR7500	REG	10098-97-2	Sr-90	0.97	pCi/g	Y1	0.25
383DH1200.5	6/7/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.72	pCi/g	G	0.25
383DH1300.5	6/7/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.29	pCi/g	G	0.42
383DH1300.5	6/7/2004	soil	EPA6010	REG	7440-38-2	Arsenic	2.5	mg/kg		1
383DH1300.5	6/7/2004	soil	EPA6010	REG	7440-39-3	Barium	2900	mg/kg		100
383DH1300.5	6/7/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.6	mg/kg		0.52
383DH1300.5	6/7/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.1	pCi/g	G,J	0.28
383DH1300.5	6/7/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.11	mg/kg	B	0.52
383DH1300.5	6/7/2004	soil	EPA6010	REG	7440-47-3	Chromium	3.3	mg/kg		1
383DH1300.5	6/7/2004	soil	HASL300	REG	10045-97-3	Cs-137	4.87	pCi/g	G	0.14
383DH1300.5	6/7/2004	soil	HASL300	REG	13966-00-2	K-40	25.9	pCi/g	G	1.1
383DH1300.5	6/7/2004	soil	EPA6010	REG	7439-92-1	Lead	22	mg/kg		0.31
383DH1300.5	6/7/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.018	mg/kg	B	0.1
383DH1300.5	6/7/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	0.84	µg/kg	J	5.2
383DH1300.5	6/7/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.06	pCi/g	J	0.26
383DH1300.5	6/7/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.37	pCi/g	G,J	0.3
383DH1300.5	6/7/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.268	pCi/g		0.018
383DH1300.5	6/7/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.48	pCi/g	G	0.13
383DH1400.5	6/7/2004	soil	HASL300	REG	14331-83-0	Ac-228	2.2	pCi/g	G	0.74
383DH1400.5	6/7/2004	soil	EPA8260	REG	67-64-1	Acetone	8.5	µg/kg	J,B	21
383DH1400.5	6/7/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3.3	mg/kg		1
383DH1400.5	6/7/2004	soil	EPA6010	REG	7440-39-3	Barium	3900	mg/kg		100
383DH1400.5	6/7/2004	soil	EPA6010	REG	7440-41-7	Beryllium	2.1	mg/kg		0.52
383DH1400.5	6/7/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.48	pCi/g	G,J	0.62
383DH1400.5	6/7/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.12	mg/kg	B	0.52
383DH1400.5	6/7/2004	soil	EPA6010	REG	7440-47-3	Chromium	5.2	mg/kg		1
383DH1400.5	6/7/2004	soil	HASL300	REG	10045-97-3	Cs-137	68.8	pCi/g	G	0.3
383DH1400.5	6/7/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	2.5	mg/kg	J	5.2
383DH1400.5	6/7/2004	soil	EPA8260	REG	100-41-4	Ethylbenzene	1.2	µg/kg	J	5.2
383DH1400.5	6/7/2004	soil	HASL300	REG	13966-00-2	K-40	26.6	pCi/g	G	2.5
383DH1400.5	6/7/2004	soil	EPA6010	REG	7439-92-1	Lead	33	mg/kg		0.31
383DH1400.5	6/7/2004	soil	EPA8260	REG	136777-61-2	M+P-Xylene	4.8	µg/kg	J	5.2
383DH1400.5	6/7/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.083	mg/kg	B	0.1

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383DH1400.5	6/7/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	1.2	µg/kg	J	5.2
383DH1400.5	6/7/2004	soil	EPA8260	REG	95-47-6	O-Xylene	1.5	µg/kg	J	5.2
383DH1400.5	6/7/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.03	pCi/g	J	0.54
383DH1400.5	6/7/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.68	pCi/g	G,J	0.9
383DH1400.5	6/7/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.68	pCi/g		0.02
383DH1400.5	6/7/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	4.21	pCi/g		0.02
383DH1400.5	6/7/2004	soil	SR7500	REG	10098-97-2	Sr-90	1.14	pCi/g	Y1	0.25
383DH1400.5	6/7/2004	soil	EPA8260	REG	100-42-5	Styrene	1.3	µg/kg	J	5.2
383DH1400.5	6/7/2004	soil	HASL300	REG	14913-50-9	TI-208	0.87	pCi/g	G	0.28
383DH1500.5	6/7/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.71	pCi/g	G	0.46
383DH1500.5	6/7/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3.4	mg/kg		1
383DH1500.5	6/7/2004	soil	EPA6010	REG	7440-39-3	Barium	4600	mg/kg		100
383DH1500.5	6/7/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.3	mg/kg		0.52
383DH1500.5	6/7/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.09	pCi/g	G,J	0.31
383DH1500.5	6/7/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.19	mg/kg	B	0.52
383DH1500.5	6/7/2004	soil	EPA6010	REG	7440-47-3	Chromium	6	mg/kg		1
383DH1500.5	6/7/2004	soil	HASL300	REG	10045-97-3	Cs-137	11.2	pCi/g	G	0.2
383DH1500.5	6/7/2004	soil	EPA8270	REG	206-44-0	Fluoranthene	13	µg/kg	J	340
383DH1500.5	6/7/2004	soil	HASL300	REG	13966-00-2	K-40	23.3	pCi/g	G	1.3
383DH1500.5	6/7/2004	soil	EPA6010	REG	7439-92-1	Lead	31	mg/kg		0.31
383DH1500.5	6/7/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.025	mg/kg	B	0.1
383DH1500.5	6/7/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.69	pCi/g	J	0.34
383DH1500.5	6/7/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.22	pCi/g	G,J	0.39
383DH1500.5	6/7/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.077	pCi/g		0.022
383DH1500.5	6/7/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.57	pCi/g		0.02
383DH1500.5	6/7/2004	soil	SR7500	REG	10098-97-2	Sr-90	0.53	pCi/g	Y1	0.23
383DH1500.5	6/7/2004	soil	HASL300	REG	14913-50-9	TI-208	0.59	pCi/g	G	0.19
383DH1600.5	6/7/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.56	pCi/g	G	0.64
383DH1600.5	6/7/2004	soil	HASL300	REG	14682-66-7	Al-26	0.105	pCi/g	G,TI	0.032
383DH1600.5	6/7/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3	mg/kg		1
383DH1600.5	6/7/2004	soil	EPA6010	REG	7440-39-3	Barium	4100	mg/kg		100
383DH1600.5	6/7/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.4	mg/kg		0.52
383DH1600.5	6/7/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.07	pCi/g	G,J	0.41
383DH1600.5	6/7/2004	soil	EPA8270	REG	117-81-7	Bis(2-Ethylhexyl)Phthalate	130	µg/kg	J	350
383DH1600.5	6/7/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.17	mg/kg	B	0.52

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383DH1600.5	6/7/2004	soil	EPA6010	REG	7440-47-3	Chromium	4.2	mg/kg		1
383DH1600.5	6/7/2004	soil	HASL300	REG	10045-97-3	Cs-137	20.5	pCi/g	G	0.2
383DH1600.5	6/7/2004	soil	EPA8270	REG	84-74-2	Di-N-Butyl Phthalate	23	µg/kg	J	350
383DH1600.5	6/7/2004	soil	EPA8260	REG	100-41-4	Ethylbenzene	1.5	µg/kg	J	5.2
383DH1600.5	6/7/2004	soil	HASL300	REG	13966-00-2	K-40	26.5	pCi/g	G	1.8
383DH1600.5	6/7/2004	soil	EPA6010	REG	7439-92-1	Lead	24	mg/kg		0.31
383DH1600.5	6/7/2004	soil	EPA8260	REG	136777-61-2	M+P-Xylene	5.8	µg/kg		5.2
383DH1600.5	6/7/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.038	mg/kg	B	0.1
383DH1600.5	6/7/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	1	µg/kg	J	5.2
383DH1600.5	6/7/2004	soil	EPA8260	REG	95-47-6	O-Xylene	1.5	µg/kg	J	5.2
383DH1600.5	6/7/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.74	pCi/g	J	0.4
383DH1600.5	6/7/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.32	pCi/g	G,J	0.51
383DH1600.5	6/7/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.13	pCi/g		0.022
383DH1600.5	6/7/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	1.08	pCi/g		0.01
383DH1600.5	6/7/2004	soil	SR7500	REG	10098-97-2	Sr-90	0.54	pCi/g	Y1	0.25
383DH1600.5	6/7/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.55	pCi/g	G	0.19
383DH1700.5	6/7/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.8	pCi/g	G	0.72
383DH1700.5	6/7/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3.4	mg/kg		1
383DH1700.5	6/7/2004	soil	EPA6010	REG	7440-39-3	Barium	2800	mg/kg		100
383DH1700.5	6/7/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.7	mg/kg		0.51
383DH1700.5	6/7/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.12	pCi/g	G,J	0.59
383DH1700.5	6/7/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.37	mg/kg	B	0.51
383DH1700.5	6/7/2004	soil	EPA6010	REG	7440-47-3	Chromium	5.8	mg/kg		1
383DH1700.5	6/7/2004	soil	HASL300	REG	10045-97-3	Cs-137	68	pCi/g	G	0.3
383DH1700.5	6/7/2004	soil	HASL300	REG	13966-00-2	K-40	19.7	pCi/g	G	2.7
383DH1700.5	6/7/2004	soil	EPA6010	REG	7439-92-1	Lead	49	mg/kg		0.31
383DH1700.5	6/7/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.061	mg/kg	B	0.1
383DH1700.5	6/7/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	1.2	µg/kg	J	5.1
383DH1700.5	6/7/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.21	pCi/g	J	0.58
383DH1700.5	6/7/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.32	pCi/g	G,J	0.84
383DH1700.5	6/7/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.41	pCi/g		0.03
383DH1700.5	6/7/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	3.55	pCi/g		0.03
383DH1700.5	6/7/2004	soil	EPA6010	REG	7782-49-2	Selenium	0.87	mg/kg		0.51
383DH1700.5	6/7/2004	soil	SR7500	REG	10098-97-2	Sr-90	1.09	pCi/g	Y1	0.24
383DH1700.5	6/7/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.7	pCi/g	G	0.32

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383DH1800.5	6/7/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.17	pCi/g	G	0.64
383DH1800.5	6/7/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3	mg/kg		1
383DH1800.5	6/7/2004	soil	EPA6010	REG	7440-39-3	Barium	4200	mg/kg		100
383DH1800.5	6/7/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.5	mg/kg		0.52
383DH1800.5	6/7/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.46	pCi/g	G,J	0.37
383DH1800.5	6/7/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.35	mg/kg	B	0.52
383DH1800.5	6/7/2004	soil	EPA6010	REG	7440-47-3	Chromium	5.5	mg/kg		1
383DH1800.5	6/7/2004	soil	HASL300	REG	10045-97-3	Cs-137	23.1	pCi/g	G	0.2
383DH1800.5	6/7/2004	soil	HASL300	REG	13966-00-2	K-40	20.6	pCi/g	G	1.3
383DH1800.5	6/7/2004	soil	EPA6010	REG	7439-92-1	Lead	21	mg/kg		0.31
383DH1800.5	6/7/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.039	mg/kg	B	0.1
383DH1800.5	6/7/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	1.1	µg/kg	J	5.2
383DH1800.5	6/7/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.69	pCi/g	J	0.32
383DH1800.5	6/7/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.18	pCi/g	G,J	0.52
383DH1800.5	6/7/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.177	pCi/g		0.023
383DH1800.5	6/7/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	1.39	pCi/g		0.02
383DH1800.5	6/7/2004	soil	SR7500	REG	10098-97-2	Sr-90	0.69	pCi/g	Y1	0.25
383DH1800.5	6/7/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.52	pCi/g	G	0.21
383DH1900.5	6/7/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.82	pCi/g	G	0.74
383DH1900.5	6/7/2004	soil	EPA6010	REG	7440-38-2	Arsenic	2.7	mg/kg		1
383DH1900.5	6/7/2004	soil	EPA6010	REG	7440-39-3	Barium	4500	mg/kg		100
383DH1900.5	6/7/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.7	mg/kg		0.51
383DH1900.5	6/7/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.27	pCi/g	G,J	0.47
383DH1900.5	6/7/2004	soil	EPA8270	REG	117-81-7	Bis(2-Ethylhexyl)Phthalate	120	µg/kg	J	340
383DH1900.5	6/7/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.33	mg/kg	B	0.51
383DH1900.5	6/7/2004	soil	EPA6010	REG	7440-47-3	Chromium	4.6	mg/kg		1
383DH1900.5	6/7/2004	soil	HASL300	REG	10045-97-3	Cs-137	42.4	pCi/g	G	0.3
383DH1900.5	6/7/2004	soil	HASL300	REG	13966-00-2	K-40	24.1	pCi/g	G	1.7
383DH1900.5	6/7/2004	soil	EPA6010	REG	7439-92-1	Lead	25	mg/kg		0.31
383DH1900.5	6/7/2004	soil	EPA8260	REG	136777-61-2	M+P-Xylene	2.4	µg/kg	J	5.1
383DH1900.5	6/7/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.034	mg/kg	B	0.1
383DH1900.5	6/7/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	1.2	µg/kg	J	5.1
383DH1900.5	6/7/2004	soil	EPA8260	REG	95-47-6	O-Xylene	1	µg/kg	J	5.1
383DH1900.5	6/7/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.78	pCi/g	J	0.47
383DH1900.5	6/7/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.3	pCi/g	G,J	0.66

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383DH1900.5	6/7/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.32	pCi/g		0.019
383DH1900.5	6/7/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	2.28	pCi/g		0.01
383DH1900.5	6/7/2004	soil	SR7500	REG	10098-97-2	Sr-90	1.14	pCi/g	Y1	0.26
383DH1900.5	6/7/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.65	pCi/g	G	0.27
383DH2000.5	6/7/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.47	pCi/g	G	0.59
383DH2000.5	6/7/2004	soil	EPA8260	REG	67-64-1	Acetone	6.6	µg/kg	J	21
383DH2000.5	6/7/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3.3	mg/kg		1
383DH2000.5	6/7/2004	soil	EPA6010	REG	7440-39-3	Barium	5300	mg/kg		100
383DH2000.5	6/7/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.3	mg/kg		0.52
383DH2000.5	6/7/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.1	pCi/g	G,J	0.38
383DH2000.5	6/7/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.3	mg/kg	B	0.52
383DH2000.5	6/7/2004	soil	EPA6010	REG	7440-47-3	Chromium	4.5	mg/kg		1
383DH2000.5	6/7/2004	soil	HASL300	REG	10045-97-3	Cs-137	24.1	pCi/g	G	0.2
383DH2000.5	6/7/2004	soil	HASL300	REG	13966-00-2	K-40	22.8	pCi/g	G	1.4
383DH2000.5	6/7/2004	soil	EPA6010	REG	7439-92-1	Lead	22	mg/kg		0.31
383DH2000.5	6/7/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.031	mg/kg	B	0.1
383DH2000.5	6/7/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.91	pCi/g	J	0.33
383DH2000.5	6/7/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.16	pCi/g	G,J	0.43
383DH2000.5	6/7/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.165	pCi/g		0.02
383DH2000.5	6/7/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	1.44	pCi/g		0.01
383DH2000.5	6/7/2004	soil	SR7500	REG	10098-97-2	Sr-90	0.68	pCi/g	Y1	0.22
383DH2000.5	6/7/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.47	pCi/g	G	0.24
383DH2100.5	6/15/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.68	pCi/g	G	0.65
383DH2100.5	6/15/2004	soil	EPA8260	REG	67-64-1	Acetone	12	µg/kg	J	21
383DH2100.5	6/15/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3.3	mg/kg		1
383DH2100.5	6/15/2004	soil	EPA6010	REG	7440-39-3	Barium	5100	mg/kg		520
383DH2100.5	6/15/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.6	mg/kg		0.52
383DH2100.5	6/15/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.37	pCi/g	G,J	0.6
383DH2100.5	6/15/2004	soil	EPA8270	REG	117-81-7	Bis(2-Ethylhexyl)Phthalate	140	µg/kg	J	350
383DH2100.5	6/15/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.27	mg/kg	B	0.52
383DH2100.5	6/15/2004	soil	EPA6010	REG	7440-47-3	Chromium	4.7	mg/kg		1
383DH2100.5	6/15/2004	soil	HASL300	REG	10045-97-3	Cs-137	78.1	pCi/g	G	0.3
383DH2100.5	6/15/2004	soil	HASL300	REG	13966-00-2	K-40	22.9	pCi/g	G	2.1
383DH2100.5	6/15/2004	soil	EPA6010	REG	7439-92-1	Lead	30	mg/kg		0.31
383DH2100.5	6/15/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.049	mg/kg	B	0.1

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383DH2100.5	6/15/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	1.2	µg/kg	J,B	5.2
383DH2100.5	6/15/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.16	pCi/g	J	0.56
383DH2100.5	6/15/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.26	pCi/g	G,J	0.66
383DH2100.5	6/15/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.341	pCi/g		0.021
383DH2100.5	6/15/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	3.3	pCi/g		0.02
383DH2100.5	6/15/2004	soil	EPA6010	REG	7782-49-2	Selenium	1.1	mg/kg		0.52
383DH2100.5	6/15/2004	soil	SR7500	REG	10098-97-2	Sr-90	1.17	pCi/g		0.34
383DH2100.5	6/15/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.69	pCi/g	G	0.28
383DH2200.5	6/15/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.37	pCi/g	G	0.53
383DH2200.5	6/15/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3.3	mg/kg		1
383DH2200.5	6/15/2004	soil	EPA6010	REG	7440-39-3	Barium	5300	mg/kg		510
383DH2200.5	6/15/2004	soil	EPA8270	REG	56-55-3	Benzo(A)Anthracene	26	µg/kg	J	340
383DH2200.5	6/15/2004	soil	EPA8270	REG	50-32-8	Benzo(A)Pyrene	37	µg/kg	J	340
383DH2200.5	6/15/2004	soil	EPA8270	REG	205-99-2	Benzo(B)Fluoranthene	51	µg/kg	J	340
383DH2200.5	6/15/2004	soil	EPA8270	REG	191-24-2	Benzo(G,H,I)Perylene	46	µg/kg	J	340
383DH2200.5	6/15/2004	soil	EPA8270	REG	207-08-9	Benzo(K)Fluoranthene	25	µg/kg	J	340
383DH2200.5	6/15/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.4	mg/kg		0.51
383DH2200.5	6/15/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.3	pCi/g	G,J	0.42
383DH2200.5	6/15/2004	soil	EPA8270	REG	117-81-7	Bis(2-Ethylhexyl)Phthalate	2400	µg/kg		340
383DH2200.5	6/15/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.26	mg/kg	B	0.51
383DH2200.5	6/15/2004	soil	EPA6010	REG	7440-47-3	Chromium	5	mg/kg		1
383DH2200.5	6/15/2004	soil	EPA8270	REG	218-01-9	Chrysene	100	µg/kg	J	340
383DH2200.5	6/15/2004	soil	HASL300	REG	10045-97-3	Cs-137	29.3	pCi/g	G	0.2
383DH2200.5	6/15/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	8.5	mg/kg	Z, H	5.1
383DH2200.5	6/15/2004	soil	EPA8270	REG	131-11-3	Dimethyl Phthalate	14	µg/kg	J	340
383DH2200.5	6/15/2004	soil	EPA8270	REG	117-84-0	Di-N-Octyl Phthalate	59	µg/kg	J	340
383DH2200.5	6/15/2004	soil	EPA8270	REG	206-44-0	Fluoranthene	23	µg/kg	J	340
383DH2200.5	6/15/2004	soil	HASL300	REG	13966-00-2	K-40	25.6	pCi/g	G	1.4
383DH2200.5	6/15/2004	soil	EPA6010	REG	7439-92-1	Lead	31	mg/kg		0.31
383DH2200.5	6/15/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.038	mg/kg	B	0.1
383DH2200.5	6/15/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	1.1	µg/kg	J,B	5.1
383DH2200.5	6/15/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.09	pCi/g	J	0.36
383DH2200.5	6/15/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.2	pCi/g	G,J	0.55
383DH2200.5	6/15/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.226	pCi/g		0.011
383DH2200.5	6/15/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	1.96	pCi/g		0.03

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383DH2200.5	6/15/2004	soil	EPA8270	REG	129-00-0	Pyrene	41	µg/kg	J	340
383DH2200.5	6/15/2004	soil	EPA6010	REG	7782-49-2	Selenium	0.4	mg/kg	B	0.51
383DH2200.5	6/15/2004	soil	SR7500	REG	10098-97-2	Sr-90	0.82	pCi/g		0.22
383DH2200.5	6/15/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.62	pCi/g	G	0.21
383DH2200.5X	6/15/2004	soil	HASL300	FD	14331-83-0	Ac-228	1.52	pCi/g	G	0.56
383DH2200.5X	6/15/2004	soil	EPA6010	FD	7440-38-2	Arsenic	3.7	mg/kg		1
383DH2200.5X	6/15/2004	soil	EPA6010	FD	7440-39-3	Barium	5200	mg/kg		510
383DH2200.5X	6/15/2004	soil	EPA8270	FD	56-55-3	Benzo(A)Anthracene	24	µg/kg	J	340
383DH2200.5X	6/15/2004	soil	EPA8270	FD	50-32-8	Benzo(A)Pyrene	40	µg/kg	J	340
383DH2200.5X	6/15/2004	soil	EPA8270	FD	205-99-2	Benzo(B)Fluoranthene	39	µg/kg	J	340
383DH2200.5X	6/15/2004	soil	EPA8270	FD	191-24-2	Benzo(G,H,I)Perylene	39	µg/kg	J	340
383DH2200.5X	6/15/2004	soil	EPA8270	FD	207-08-9	Benzo(K)Fluoranthene	29	µg/kg	J	340
383DH2200.5X	6/15/2004	soil	EPA6010	FD	7440-41-7	Beryllium	1.5	mg/kg		0.51
383DH2200.5X	6/15/2004	soil	HASL300	FD	14733-03-0	Bi-214	1.23	pCi/g	G,J	0.39
383DH2200.5X	6/15/2004	soil	EPA8270	FD	117-81-7	Bis(2-Ethylhexyl)Phthalate	170	µg/kg	J	340
383DH2200.5X	6/15/2004	soil	EPA6010	FD	7440-43-9	Cadmium	0.28	mg/kg	B	0.51
383DH2200.5X	6/15/2004	soil	EPA6010	FD	7440-47-3	Chromium	5.2	mg/kg		1
383DH2200.5X	6/15/2004	soil	EPA8270	FD	218-01-9	Chrysene	95	µg/kg	J	340
383DH2200.5X	6/15/2004	soil	HASL300	FD	10045-97-3	Cs-137	28	pCi/g	G	0.2
383DH2200.5X	6/15/2004	soil	EPA8015	FD	68334-30-5	Diesel-Range Organics	6.2	mg/kg	Z, H	5.1
383DH2200.5X	6/15/2004	soil	EPA8270	FD	206-44-0	Fluoranthene	23	µg/kg	J	340
383DH2200.5X	6/15/2004	soil	HASL300	FD	13966-00-2	K-40	21.8	pCi/g	G	1.8
383DH2200.5X	6/15/2004	soil	EPA6010	FD	7439-92-1	Lead	31	mg/kg		0.31
383DH2200.5X	6/15/2004	soil	EPA7470	FD	7439-97-6	Mercury	0.037	mg/kg	B	0.1
383DH2200.5X	6/15/2004	soil	EPA8260	FD	75-09-2	Methylene Chloride	0.87	µg/kg	J,B	5.1
383DH2200.5X	6/15/2004	soil	HASL300	FD	15092-94-1	Pb-212	1.86	pCi/g	J	0.42
383DH2200.5X	6/15/2004	soil	HASL300	FD	15067-28-4	Pb-214	1.05	pCi/g	G,J	0.55
383DH2200.5X	6/15/2004	soil	UGTAISOPU	FD	13981-16-3	Pu-238	0.238	pCi/g		0.026
383DH2200.5X	6/15/2004	soil	UGTAISOPU	FD	15117-48-3	Pu-239	1.87	pCi/g		0.03
383DH2200.5X	6/15/2004	soil	EPA6010	FD	7782-49-2	Selenium	0.43	mg/kg	B	0.51
383DH2200.5X	6/15/2004	soil	SR7500	FD	10098-97-2	Sr-90	0.76	pCi/g		0.22
383DH2200.5X	6/15/2004	soil	HASL300	FD	14913-50-9	Tl-208	0.64	pCi/g	G	0.19
383DH2300.5	6/15/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.55	pCi/g	G	0.56
383DH2300.5	6/15/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3.7	mg/kg		1
383DH2300.5	6/15/2004	soil	EPA6010	REG	7440-39-3	Barium	5400	mg/kg		510

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383DH2300.5	6/15/2004	soil	EPA8270	REG	56-55-3	Benzo(A)Anthracene	38	µg/kg	J	340
383DH2300.5	6/15/2004	soil	EPA8270	REG	50-32-8	Benzo(A)Pyrene	38	µg/kg	J	340
383DH2300.5	6/15/2004	soil	EPA8270	REG	205-99-2	Benzo(B)Fluoranthene	61	µg/kg	J	340
383DH2300.5	6/15/2004	soil	EPA8270	REG	207-08-9	Benzo(K)Fluoranthene	44	µg/kg	J	340
383DH2300.5	6/15/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.3	mg/kg		0.51
383DH2300.5	6/15/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.92	pCi/g	G,J	0.41
383DH2300.5	6/15/2004	soil	EPA8270	REG	117-81-7	Bis(2-Ethylhexyl)Phthalate	82	µg/kg	J	340
383DH2300.5	6/15/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.2	mg/kg	B	0.51
383DH2300.5	6/15/2004	soil	EPA6010	REG	7440-47-3	Chromium	5.6	mg/kg		1
383DH2300.5	6/15/2004	soil	EPA8270	REG	218-01-9	Chrysene	55	µg/kg	J	340
383DH2300.5	6/15/2004	soil	HASL300	REG	10045-97-3	Cs-137	37.9	pCi/g	G	0.2
383DH2300.5	6/15/2004	soil	EPA8270	REG	206-44-0	Fluoranthene	33	µg/kg	J	340
383DH2300.5	6/15/2004	soil	HASL300	REG	13966-00-2	K-40	21	pCi/g	G	1.7
383DH2300.5	6/15/2004	soil	EPA6010	REG	7439-92-1	Lead	30	mg/kg		0.31
383DH2300.5	6/15/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.035	mg/kg	B	0.1
383DH2300.5	6/15/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	0.91	µg/kg	J,B	5.1
383DH2300.5	6/15/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.7	pCi/g	J	0.38
383DH2300.5	6/15/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.19	pCi/g	G,J	0.49
383DH2300.5	6/15/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.238	pCi/g		0.023
383DH2300.5	6/15/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	2.7	pCi/g		0.02
383DH2300.5	6/15/2004	soil	EPA8270	REG	129-00-0	Pyrene	42	µg/kg	J	340
383DH2300.5	6/15/2004	soil	EPA6010	REG	7782-49-2	Selenium	0.7	mg/kg		0.51
383DH2300.5	6/15/2004	soil	SR7500	REG	10098-97-2	Sr-90	1.65	pCi/g		0.28
383DH2300.5	6/15/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.51	pCi/g	G	0.2
383DH2400.5	6/15/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.29	pCi/g	G	0.48
383DH2400.5	6/15/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3.3	mg/kg		1
383DH2400.5	6/15/2004	soil	EPA6010	REG	7440-39-3	Barium	5400	mg/kg		520
383DH2400.5	6/15/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.2	mg/kg		0.52
383DH2400.5	6/15/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.92	pCi/g	G,J	0.39
383DH2400.5	6/15/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.21	mg/kg	B	0.52
383DH2400.5	6/15/2004	soil	EPA6010	REG	7440-47-3	Chromium	4.6	mg/kg		1
383DH2400.5	6/15/2004	soil	HASL300	REG	10045-97-3	Cs-137	32	pCi/g	G	0.2
383DH2400.5	6/15/2004	soil	HASL300	REG	13966-00-2	K-40	20.1	pCi/g	G	1.5
383DH2400.5	6/15/2004	soil	EPA6010	REG	7439-92-1	Lead	22	mg/kg		0.31
383DH2400.5	6/15/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.034	mg/kg	B	0.1

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383DH2400.5	6/15/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.76	pCi/g	J	0.34
383DH2400.5	6/15/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.29	pCi/g	G,J	0.62
383DH2400.5	6/15/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.316	pCi/g		0.01
383DH2400.5	6/15/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	2.34	pCi/g		0.01
383DH2400.5	6/15/2004	soil	SR7500	REG	10098-97-2	Sr-90	1.73	pCi/g		0.26
383DH2400.5	6/15/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.3	pCi/g	G	0.17
383DH2500.5	6/15/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.62	pCi/g	G	0.61
383DH2500.5	6/15/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3.3	mg/kg		1
383DH2500.5	6/15/2004	soil	EPA6010	REG	7440-39-3	Barium	5100	mg/kg		520
383DH2500.5	6/15/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.5	mg/kg		0.52
383DH2500.5	6/15/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.19	pCi/g	G,J	0.48
383DH2500.5	6/15/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.17	mg/kg	B	0.52
383DH2500.5	6/15/2004	soil	EPA6010	REG	7440-47-3	Chromium	4.8	mg/kg		1
383DH2500.5	6/15/2004	soil	HASL300	REG	10045-97-3	Cs-137	55.6	pCi/g	G	0.3
383DH2500.5	6/15/2004	soil	HASL300	REG	13966-00-2	K-40	26.3	pCi/g	G	1.8
383DH2500.5	6/15/2004	soil	EPA6010	REG	7439-92-1	Lead	23	mg/kg		0.31
383DH2500.5	6/15/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.052	mg/kg	B	0.1
383DH2500.5	6/15/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	0.9	µg/kg	J,B	5.2
383DH2500.5	6/15/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.78	pCi/g	J	0.44
383DH2500.5	6/15/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.28	pCi/g	G,J	0.73
383DH2500.5	6/15/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.265	pCi/g		0.021
383DH2500.5	6/15/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	3.1	pCi/g		0.02
383DH2500.5	6/15/2004	soil	EPA6010	REG	7782-49-2	Selenium	0.41	mg/kg	B	0.52
383DH2500.5	6/15/2004	soil	SR7500	REG	10098-97-2	Sr-90	1.09	pCi/g		0.25
383DH2500.5	6/15/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.57	pCi/g	G	0.3
383DH2600.5	6/15/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.52	pCi/g	G	0.61
383DH2600.5	6/15/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3.4	mg/kg		1
383DH2600.5	6/15/2004	soil	EPA6010	REG	7440-39-3	Barium	6100	mg/kg		520
383DH2600.5	6/15/2004	soil	EPA8270	REG	56-55-3	Benzo(A)Anthracene	66	µg/kg	J	350
383DH2600.5	6/15/2004	soil	EPA8270	REG	50-32-8	Benzo(A)Pyrene	64	µg/kg	J	350
383DH2600.5	6/15/2004	soil	EPA8270	REG	205-99-2	Benzo(B)Fluoranthene	62	µg/kg	J	350
383DH2600.5	6/15/2004	soil	EPA8270	REG	207-08-9	Benzo(K)Fluoranthene	57	µg/kg	J	350
383DH2600.5	6/15/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.5	mg/kg		0.52
383DH2600.5	6/15/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.13	pCi/g	G,J	0.47
383DH2600.5	6/15/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.25	mg/kg	B	0.52

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383DH2600.5	6/15/2004	soil	EPA6010	REG	7440-47-3	Chromium	5	mg/kg		1
383DH2600.5	6/15/2004	soil	EPA8270	REG	218-01-9	Chrysene	82	µg/kg	J	350
383DH2600.5	6/15/2004	soil	HASL300	REG	10045-97-3	Cs-137	28.4	pCi/g	G	0.2
383DH2600.5	6/15/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	2.5	mg/kg	J	5.2
383DH2600.5	6/15/2004	soil	EPA8270	REG	206-44-0	Fluoranthene	120	µg/kg	J	350
383DH2600.5	6/15/2004	soil	HASL300	REG	13966-00-2	K-40	24.8	pCi/g	G	1.5
383DH2600.5	6/15/2004	soil	EPA6010	REG	7439-92-1	Lead	28	mg/kg		0.31
383DH2600.5	6/15/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.038	mg/kg	B	0.1
383DH2600.5	6/15/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	0.99	µg/kg	J,B	5.2
383DH2600.5	6/15/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.01	pCi/g	J	0.34
383DH2600.5	6/15/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.4	pCi/g	G,J	0.49
383DH2600.5	6/15/2004	soil	EPA8270	REG	85-01-8	Phenanthrene	49	µg/kg	J	350
383DH2600.5	6/15/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.188	pCi/g		0.021
383DH2600.5	6/15/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	1.82	pCi/g		0.01
383DH2600.5	6/15/2004	soil	EPA8270	REG	129-00-0	Pyrene	190	µg/kg	J	350
383DH2600.5	6/15/2004	soil	SR7500	REG	10098-97-2	Sr-90	0.93	pCi/g		0.25
383DH2600.5	6/15/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.46	pCi/g	G	0.19
383DH2700.5	6/16/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.66	pCi/g	G	0.67
383DH2700.5	6/16/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3.4	mg/kg		1
383DH2700.5	6/16/2004	soil	EPA6010	REG	7440-39-3	Barium	5600	mg/kg		520
383DH2700.5	6/16/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.4	mg/kg		0.52
383DH2700.5	6/16/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.43	pCi/g	G,J	0.36
383DH2700.5	6/16/2004	soil	EPA8270	REG	117-81-7	Bis(2-Ethylhexyl)Phthalate	100	µg/kg	J	350
383DH2700.5	6/16/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.2	mg/kg	B	0.52
383DH2700.5	6/16/2004	soil	EPA6010	REG	7440-47-3	Chromium	5.3	mg/kg		1
383DH2700.5	6/16/2004	soil	HASL300	REG	10045-97-3	Cs-137	41.7	pCi/g	G	0.2
383DH2700.5	6/16/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	1.8	mg/kg	J	5.2
383DH2700.5	6/16/2004	soil	EPA8260	REG	87-68-3	Hexachlorobutadiene	1.6	µg/kg	J	5.2
383DH2700.5	6/16/2004	soil	HASL300	REG	13966-00-2	K-40	20.9	pCi/g	G	1.7
383DH2700.5	6/16/2004	soil	EPA6010	REG	7439-92-1	Lead	25	mg/kg		0.31
383DH2700.5	6/16/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.043	mg/kg	B	0.1
383DH2700.5	6/16/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	1.1	µg/kg	J,B	5.2
383DH2700.5	6/16/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.58	pCi/g	J	0.38
383DH2700.5	6/16/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.15	pCi/g	G,J	0.48
383DH2700.5	6/16/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.271	pCi/g		0.019

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383DH2700.5	6/16/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	3.31	pCi/g		0.02
383DH2700.5	6/16/2004	soil	EPA6010	REG	7782-49-2	Selenium	0.43	mg/kg	B	0.52
383DH2700.5	6/16/2004	soil	SR7500	REG	10098-97-2	Sr-90	1.55	pCi/g		0.25
383DH2700.5	6/16/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.51	pCi/g	G	0.2
383DH2800.5	6/16/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.72	pCi/g	G	0.62
383DH2800.5	6/16/2004	soil	EPA6010	REG	7440-38-2	Arsenic	2.8	mg/kg		1
383DH2800.5	6/16/2004	soil	EPA6010	REG	7440-39-3	Barium	5300	mg/kg		520
383DH2800.5	6/16/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.7	mg/kg		0.52
383DH2800.5	6/16/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.26	pCi/g	G,J	0.36
383DH2800.5	6/16/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.16	mg/kg	B	0.52
383DH2800.5	6/16/2004	soil	EPA6010	REG	7440-47-3	Chromium	4	mg/kg		1
383DH2800.5	6/16/2004	soil	HASL300	REG	10045-97-3	Cs-137	14	pCi/g	G	0.2
383DH2800.5	6/16/2004	soil	HASL300	REG	13966-00-2	K-40	27.7	pCi/g	G	1.8
383DH2800.5	6/16/2004	soil	EPA6010	REG	7439-92-1	Lead	27	mg/kg		0.31
383DH2800.5	6/16/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.023	mg/kg	B	0.1
383DH2800.5	6/16/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	1.4	µg/kg	J,B	5.2
383DH2800.5	6/16/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.19	pCi/g	J	0.28
383DH2800.5	6/16/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.4	pCi/g	G,J	0.47
383DH2800.5	6/16/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.068	pCi/g		0.021
383DH2800.5	6/16/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.93	pCi/g		0.01
383DH2800.5	6/16/2004	soil	SR7500	REG	10098-97-2	Sr-90	0.45	pCi/g	Y1,L1	0.22
383DH2800.5	6/16/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.67	pCi/g	G	0.18
383DH2900.5	6/16/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.59	pCi/g	G	0.5
383DH2900.5	6/16/2004	soil	EPA8260	REG	67-64-1	Acetone	7.1	µg/kg	J	21
383DH2900.5	6/16/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3.5	mg/kg		1
383DH2900.5	6/16/2004	soil	EPA6010	REG	7440-39-3	Barium	5900	mg/kg		520
383DH2900.5	6/16/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.3	mg/kg		0.52
383DH2900.5	6/16/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.12	pCi/g	G,J	0.47
383DH2900.5	6/16/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.2	mg/kg	B	0.52
383DH2900.5	6/16/2004	soil	EPA6010	REG	7440-47-3	Chromium	5.6	mg/kg		1
383DH2900.5	6/16/2004	soil	HASL300	REG	10045-97-3	Cs-137	33.1	pCi/g	G	0.2
383DH2900.5	6/16/2004	soil	HASL300	REG	13966-00-2	K-40	22.1	pCi/g	G	2.1
383DH2900.5	6/16/2004	soil	EPA6010	REG	7439-92-1	Lead	29	mg/kg		0.31
383DH2900.5	6/16/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.042	mg/kg	B	0.1
383DH2900.5	6/16/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	1.4	µg/kg	J,B	5.2

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383DH2900.5	6/16/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.75	pCi/g	J	0.37
383DH2900.5	6/16/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.06	pCi/g	G,J	0.44
383DH2900.5	6/16/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.237	pCi/g		0.017
383DH2900.5	6/16/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	2.14	pCi/g		0.02
383DH2900.5	6/16/2004	soil	SR7500	REG	10098-97-2	Sr-90	0.76	pCi/g		0.25
383DH2900.5	6/16/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.47	pCi/g	G	0.2
383DH3000.5	6/16/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.41	pCi/g	G	0.56
383DH3000.5	6/16/2004	soil	EPA6010	REG	7440-38-2	Arsenic	2.4	mg/kg		1
383DH3000.5	6/16/2004	soil	EPA6010	REG	7440-39-3	Barium	5100	mg/kg		510
383DH3000.5	6/16/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.2	mg/kg		0.51
383DH3000.5	6/16/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.89	pCi/g	G,J	0.27
383DH3000.5	6/16/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.21	mg/kg	B	0.51
383DH3000.5	6/16/2004	soil	EPA6010	REG	7440-47-3	Chromium	5.8	mg/kg		1
383DH3000.5	6/16/2004	soil	HASL300	REG	10045-97-3	Cs-137	7.67	pCi/g	G	0.13
383DH3000.5	6/16/2004	soil	HASL300	REG	13966-00-2	K-40	25.6	pCi/g	G	1.7
383DH3000.5	6/16/2004	soil	EPA6010	REG	7439-92-1	Lead	20	mg/kg		0.31
383DH3000.5	6/16/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.015	mg/kg	B	0.1
383DH3000.5	6/16/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	1.4	µg/kg	J,B	5.1
383DH3000.5	6/16/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.81	pCi/g	J	0.25
383DH3000.5	6/16/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.22	pCi/g	G,J	0.32
383DH3000.5	6/16/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.042	pCi/g	LT	0.009
383DH3000.5	6/16/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.286	pCi/g		0.022
383DH3000.5	6/16/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.55	pCi/g	G	0.15
383DH3100.5	6/16/2004	soil	HASL300	REG	14331-83-0	Ac-228	0.91	pCi/g	G	0.39
383DH3100.5	6/16/2004	soil	EPA6010	REG	7440-38-2	Arsenic	5.3	mg/kg		1
383DH3100.5	6/16/2004	soil	EPA6010	REG	7440-39-3	Barium	6500	mg/kg		510
383DH3100.5	6/16/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.77	mg/kg		0.51
383DH3100.5	6/16/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.84	pCi/g	G,J	0.28
383DH3100.5	6/16/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.22	mg/kg	B	0.51
383DH3100.5	6/16/2004	soil	EPA6010	REG	7440-47-3	Chromium	8.4	mg/kg		1
383DH3100.5	6/16/2004	soil	HASL300	REG	10045-97-3	Cs-137	8.4	pCi/g	G	0.1
383DH3100.5	6/16/2004	soil	HASL300	REG	13966-00-2	K-40	17.2	pCi/g	G	1.3
383DH3100.5	6/16/2004	soil	EPA6010	REG	7439-92-1	Lead	18	mg/kg		0.61
383DH3100.5	6/16/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.021	mg/kg	B	0.1
383DH3100.5	6/16/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	1.2	µg/kg	J,B	5.1

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383DH3100.5	6/16/2004	soil	HASL300	REG	15092-94-1	Pb-212	0.74	pCi/g	J	0.26
383DH3100.5	6/16/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.87	pCi/g	G,J	0.36
383DH3100.5	6/16/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.08	pCi/g		0.018
383DH3100.5	6/16/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.51	pCi/g		0.01
383DH3100.5	6/16/2004	soil	EPA6010	REG	7782-49-2	Selenium	0.37	mg/kg	B	0.51
383DH3200.5	6/16/2004	soil	HASL300	REG	14331-83-0	Ac-228	0.7	pCi/g	G	0.38
383DH3200.5	6/16/2004	soil	EPA6010	REG	7440-38-2	Arsenic	4.6	mg/kg		1
383DH3200.5	6/16/2004	soil	EPA6010	REG	7440-39-3	Barium	6600	mg/kg		510
383DH3200.5	6/16/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.83	mg/kg		0.51
383DH3200.5	6/16/2004	soil	HASL300	REG	14733-03-0	Bi-214	1	pCi/g	G,J	0.3
383DH3200.5	6/16/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.23	mg/kg	B	0.51
383DH3200.5	6/16/2004	soil	EPA6010	REG	7440-47-3	Chromium	9.2	mg/kg		1
383DH3200.5	6/16/2004	soil	HASL300	REG	10045-97-3	Cs-137	12.7	pCi/g	G	0.1
383DH3200.5	6/16/2004	soil	HASL300	REG	13966-00-2	K-40	17	pCi/g	G	1.4
383DH3200.5	6/16/2004	soil	EPA6010	REG	7439-92-1	Lead	21	mg/kg		0.61
383DH3200.5	6/16/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.021	mg/kg	B	0.1
383DH3200.5	6/16/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	0.82	µg/kg	J,B	5.1
383DH3200.5	6/16/2004	soil	HASL300	REG	15092-94-1	Pb-212	0.85	pCi/g	J	0.27
383DH3200.5	6/16/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.8	pCi/g	G,J	0.46
383DH3200.5	6/16/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.058	pCi/g		0.021
383DH3200.5	6/16/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.66	pCi/g		0.02
383DH3200.5	6/16/2004	soil	EPA6010	REG	7782-49-2	Selenium	0.29	mg/kg	B	0.51
383DH3200.5	6/16/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.41	pCi/g	G	0.18
383DH3300.5	6/16/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.9	pCi/g	G	0.66
383DH3300.5	6/16/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3.9	mg/kg		1
383DH3300.5	6/16/2004	soil	EPA6010	REG	7440-39-3	Barium	5900	mg/kg		510
383DH3300.5	6/16/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.4	mg/kg		0.51
383DH3300.5	6/16/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.06	pCi/g	G,J	0.36
383DH3300.5	6/16/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.26	mg/kg	B	0.51
383DH3300.5	6/16/2004	soil	EPA6010	REG	7440-47-3	Chromium	5.5	mg/kg		1
383DH3300.5	6/16/2004	soil	HASL300	REG	10045-97-3	Cs-137	7.5	pCi/g	G	0.2
383DH3300.5	6/16/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	2.2	mg/kg	J	5.1
383DH3300.5	6/16/2004	soil	HASL300	REG	13966-00-2	K-40	25.3	pCi/g	G	2
383DH3300.5	6/16/2004	soil	EPA6010	REG	7439-92-1	Lead	30	mg/kg		0.31
383DH3300.5	6/16/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.019	mg/kg	B	0.1

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383DH3300.5	6/16/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	1.3	µg/kg	J,B	5.1
383DH3300.5	6/16/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.88	pCi/g	J	0.32
383DH3300.5	6/16/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.26	pCi/g	G,J	0.38
383DH3300.5	6/16/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.04	pCi/g	LT	0.01
383DH3300.5	6/16/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.261	pCi/g		0.01
383DH3300.5	6/16/2004	soil	EPA6010	REG	7782-49-2	Selenium	0.44	mg/kg	B	0.51
383DH3300.5	6/16/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.47	pCi/g	G	0.18
383DH3400.5	6/10/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.6	pCi/g	G	0.5
383DH3400.5	6/10/2004	soil	EPA8260	REG	67-64-1	Acetone	6.5	µg/kg	J	21
383DH3400.5	6/10/2004	soil	EPA6010	REG	7440-38-2	Arsenic	2.6	mg/kg		1.1
383DH3400.5	6/10/2004	soil	EPA6010	REG	7440-39-3	Barium	3900	mg/kg		110
383DH3400.5	6/10/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1	mg/kg		0.53
383DH3400.5	6/10/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.01	pCi/g	G,J	0.28
383DH3400.5	6/10/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.22	mg/kg	B	0.53
383DH3400.5	6/10/2004	soil	EPA6010	REG	7440-47-3	Chromium	3.9	mg/kg		1.1
383DH3400.5	6/10/2004	soil	HASL300	REG	10045-97-3	Cs-137	11.7	pCi/g	G	0.1
383DH3400.5	6/10/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	51	mg/kg	Z,H	5.3
383DH3400.5	6/10/2004	soil	HASL300	REG	13966-00-2	K-40	22.8	pCi/g	G	1.4
383DH3400.5	6/10/2004	soil	EPA6010	REG	7439-92-1	Lead	14	mg/kg		0.32
383DH3400.5	6/10/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.025	mg/kg	B	0.11
383DH3400.5	6/10/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.7	pCi/g	J	0.3
383DH3400.5	6/10/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.26	pCi/g	G,J	0.34
383DH3400.5	6/10/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.143	pCi/g		0.019
383DH3400.5	6/10/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	1.01	pCi/g	J	0.02
383DH3400.5	6/10/2004	soil	SR7500	REG	10098-97-2	Sr-90	0.69	pCi/g		0.23
383DH3400.5	6/10/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.47	pCi/g	G	0.16
383DH3500.5	6/10/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.42	pCi/g	G	0.52
383DH3500.5	6/10/2004	soil	EPA8260	REG	67-64-1	Acetone	6.6	µg/kg	J	23
383DH3500.5	6/10/2004	soil	EPA6010	REG	7440-38-2	Arsenic	4.5	mg/kg		1.2
383DH3500.5	6/10/2004	soil	EPA6010	REG	7440-39-3	Barium	4600	mg/kg		120
383DH3500.5	6/10/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.9	mg/kg		0.58
383DH3500.5	6/10/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.76	pCi/g	G,J	0.28
383DH3500.5	6/10/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.28	mg/kg	B	0.58
383DH3500.5	6/10/2004	soil	EPA6010	REG	7440-47-3	Chromium	5.8	mg/kg		1.2
383DH3500.5	6/10/2004	soil	HASL300	REG	10045-97-3	Cs-137	5.97	pCi/g	G	0.14

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383DH3500.5	6/10/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	68	mg/kg	Z,H	5.8
383DH3500.5	6/10/2004	soil	HASL300	REG	13966-00-2	K-40	17	pCi/g	G	1.6
383DH3500.5	6/10/2004	soil	EPA6010	REG	7439-92-1	Lead	19	mg/kg		3.5
383DH3500.5	6/10/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.026	mg/kg	B	0.12
383DH3500.5	6/10/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.44	pCi/g	J	0.26
383DH3500.5	6/10/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.14	pCi/g	G,J	0.31
383DH3500.5	6/10/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.147	pCi/g		0.02
383DH3500.5	6/10/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.51	pCi/g	J	0.01
383DH3500.5	6/10/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.5	pCi/g	G	0.13
383GB0100.5	2/4/2004	soil	HASL300	REG	14331-83-0	Ac-228	2.14	pCi/g	G	1.04
383GB0100.5	2/4/2004	soil	EPA6010	REG	7440-38-2	Arsenic	4.4	mg/kg		1.2
383GB0100.5	2/4/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.3	mg/kg		0.58
383GB0100.5	2/4/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.41	pCi/g	G	0.73
383GB0100.5	2/4/2004	soil	HASL300	REG	10045-97-3	Cs-137	0.78	pCi/g	G	0.31
383GB0100.5	2/4/2004	soil	HASL300	REG	13966-00-2	K-40	18.9	pCi/g	G	4.4
383GB0100.5	2/4/2004	soil	EPA6010	REG	7439-92-1	Lead	12	mg/kg		0.35
383GB0100.5	2/4/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.66	pCi/g	J	0.52
383GB0100.5	2/4/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.099	pCi/g	J	0.009
383GB0100.5	2/4/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.64	pCi/g	G	0.27
383GB0200.5	2/4/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.85	pCi/g	TI,G	0.85
383GB0200.5	2/4/2004	soil	EPA6010	REG	7440-38-2	Arsenic	4.3	mg/kg		1.1
383GB0200.5	2/4/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.72	mg/kg		0.55
383GB0200.5	2/4/2004	soil	HASL300	REG	10045-97-3	Cs-137	4.39	pCi/g	G	0.23
383GB0200.5	2/4/2004	soil	HASL300	REG	13966-00-2	K-40	17.8	pCi/g	G	2.8
383GB0200.5	2/4/2004	soil	EPA6010	REG	7439-92-1	Lead	75	mg/kg		0.33
383GB0200.5	2/4/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.3	pCi/g	J	0.42
383GB0200.5	2/4/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.032	pCi/g	LT	0.01
383GB0200.5	2/4/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.318	pCi/g	J	0.018
383GB0200.5	2/4/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.43	pCi/g	G	0.22
383GB0300.5	2/4/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3	mg/kg		1.1
383GB0300.5	2/4/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.79	mg/kg		0.57
383GB0300.5	2/4/2004	soil	HASL300	REG	13966-00-2	K-40	24	pCi/g	G	3.1
383GB0300.5	2/4/2004	soil	EPA6010	REG	7439-92-1	Lead	26	mg/kg		0.34
383GB0300.5	2/4/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.87	pCi/g	J	0.38
383GB0300.5	2/4/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.81	pCi/g	J	0.43

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383GB0300.5	2/4/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.241	pCi/g	J	0.018
383GB0400.5	2/4/2004	soil	HASL300	REG	14331-83-0	Ac-228	2.09	pCi/g	G	1.05
383GB0400.5	2/4/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3.8	mg/kg		1.1
383GB0400.5	2/4/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.82	mg/kg		0.57
383GB0400.5	2/4/2004	soil	HASL300	REG	10045-97-3	Cs-137	1.86	pCi/g	G	0.27
383GB0400.5	2/4/2004	soil	HASL300	REG	13966-00-2	K-40	26	pCi/g	G	3.2
383GB0400.5	2/4/2004	soil	EPA6010	REG	7439-92-1	Lead	60	mg/kg		0.34
383GB0400.5	2/4/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.78	pCi/g	J	0.3
383GB0400.5	2/4/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.093	pCi/g	J	0.022
383GB0500.5	2/4/2004	soil	HASL300	REG	14331-83-0	Ac-228	2.27	pCi/g	G	0.55
383GB0500.5	2/4/2004	soil	EPA6010	REG	7440-38-2	Arsenic	5.3	mg/kg		1.1
383GB0500.5	2/4/2004	soil	EPA6010	REG	7440-39-3	Barium	130	mg/kg		11
383GB0500.5	2/4/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1	mg/kg		0.57
383GB0500.5	2/4/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.24	pCi/g	G	0.33
383GB0500.5	2/4/2004	soil	EPA6010	REG	7440-47-3	Chromium	8.2	mg/kg		1.1
383GB0500.5	2/4/2004	soil	HASL300	REG	10045-97-3	Cs-137	1.27	pCi/g	G	0.18
383GB0500.5	2/4/2004	soil	HASL300	REG	13966-00-2	K-40	30.7	pCi/g	G	1.6
383GB0500.5	2/4/2004	soil	EPA6010	REG	7439-92-1	Lead	15	mg/kg		0.34
383GB0500.5	2/4/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.065	mg/kg	B	0.11
383GB0500.5	2/4/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.47	pCi/g	J	0.24
383GB0500.5	2/4/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.07	pCi/g	J	0.32
383GB0500.5	2/4/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.38	pCi/g		0.03
383GB0500.5	2/4/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	1.41	pCi/g		0.02
383GB0500.5	2/4/2004	soil	EPA6010	REG	7782-49-2	Selenium	0.52	mg/kg	B	0.57
383GB0500.5	2/4/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.83	pCi/g	G	0.17
383GB0600.5	2/4/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.44	pCi/g	G	0.53
383GB0600.5	2/4/2004	soil	EPA6010	REG	7440-38-2	Arsenic	4	mg/kg		1.1
383GB0600.5	2/4/2004	soil	EPA6010	REG	7440-39-3	Barium	290	mg/kg		11
383GB0600.5	2/4/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.88	mg/kg		0.57
383GB0600.5	2/4/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.79	pCi/g	G	0.29
383GB0600.5	2/4/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.11	mg/kg	J	0.57
383GB0600.5	2/4/2004	soil	EPA6010	REG	7440-47-3	Chromium	8.4	mg/kg		1.1
383GB0600.5	2/4/2004	soil	HASL300	REG	10045-97-3	Cs-137	2.7	pCi/g	G	0.14
383GB0600.5	2/4/2004	soil	HASL300	REG	13966-00-2	K-40	16.3	pCi/g	G	1.3
383GB0600.5	2/4/2004	soil	EPA6010	REG	7439-92-1	Lead	16	mg/kg		0.68

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383GB0600.5	2/4/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.032	mg/kg	B	0.11
383GB0600.5	2/4/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.48	pCi/g	J	0.2
383GB0600.5	2/4/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.89	pCi/g	J	0.28
383GB0600.5	2/4/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.71	pCi/g		0.02
383GB0600.5	2/4/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	5.08	pCi/g		0.02
383GB0600.5	2/4/2004	soil	EPA6010	REG	7782-49-2	Selenium	0.71	mg/kg		0.57
383GB0600.5	2/4/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.38	pCi/g	G	0.13
383GB0700.5	2/4/2004	soil	EPA6010	REG	7440-38-2	Arsenic	2.6	mg/kg		1.1
383GB0700.5	2/4/2004	soil	EPA6010	REG	7440-39-3	Barium	170	mg/kg		11
383GB0700.5	2/4/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.45	pCi/g	G	0.22
383GB0700.5	2/4/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.32	mg/kg	B	0.54
383GB0700.5	2/4/2004	soil	EPA6010	REG	7440-47-3	Chromium	5	mg/kg		1.1
383GB0700.5	2/4/2004	soil	HASL300	REG	10045-97-3	Cs-137	0.46	pCi/g	LT,G	0.1
383GB0700.5	2/4/2004	soil	HASL300	REG	13966-00-2	K-40	8.8	pCi/g	G	0.8
383GB0700.5	2/4/2004	soil	EPA6010	REG	7439-92-1	Lead	21	mg/kg		1.6
383GB0700.5	2/4/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.032	mg/kg	B	0.11
383GB0700.5	2/4/2004	soil	HASL300	REG	15092-94-1	Pb-212	0.72	pCi/g	J	0.16
383GB0700.5	2/4/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.6	pCi/g	J	0.21
383GB0700.5	2/4/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.088	pCi/g		0.018
383GB0700.5	2/4/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.242	pCi/g		0.009
383GB0700.5	2/4/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.247	pCi/g	G	0.113
383GB0800.5	2/4/2004	soil	HASL300	FD	14331-83-0	Ac-228	1.36	pCi/g	G	0.52
383GB0800.5	2/4/2004	soil	HASL300	FD	14596-10-2	Am-241	0.62	pCi/g	J	0.28
383GB0800.5	2/4/2004	soil	EPA6010	FD	7440-38-2	Arsenic	4.5	mg/kg		1.2
383GB0800.5	2/4/2004	soil	EPA6010	FD	7440-39-3	Barium	260	mg/kg		12
383GB0800.5	2/4/2004	soil	EPA6010	FD	7440-41-7	Beryllium	0.87	mg/kg		0.58
383GB0800.5	2/4/2004	soil	HASL300	FD	14733-03-0	Bi-214	0.73	pCi/g	G	0.3
383GB0800.5	2/4/2004	soil	EPA6010	FD	7440-43-9	Cadmium	0.081	mg/kg	J	0.58
383GB0800.5	2/4/2004	soil	EPA6010	FD	7440-47-3	Chromium	8.4	mg/kg		1.2
383GB0800.5	2/4/2004	soil	HASL300	FD	10045-97-3	Cs-137	2.25	pCi/g	G	0.2
383GB0800.5	2/4/2004	soil	HASL300	FD	13966-00-2	K-40	12.9	pCi/g	G	2
383GB0800.5	2/4/2004	soil	EPA6010	FD	7439-92-1	Lead	17	mg/kg		1.7
383GB0800.5	2/4/2004	soil	EPA7470	FD	7439-97-6	Mercury	0.035	mg/kg	B	0.12
383GB0800.5	2/4/2004	soil	HASL300	FD	15092-94-1	Pb-212	1.26	pCi/g	J	0.26
383GB0800.5	2/4/2004	soil	HASL300	FD	15067-28-4	Pb-214	0.97	pCi/g	J	0.36

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383GB0800.5	2/4/2004	soil	UGTAISOPU	FD	13981-16-3	Pu-238	0.71	pCi/g		0.01
383GB0800.5	2/4/2004	soil	UGTAISOPU	FD	15117-48-3	Pu-239	2.43	pCi/g		0.02
383GB0800.5	2/4/2004	soil	HASL300	FD	14913-50-9	Tl-208	0.51	pCi/g	G	0.16
383GB0901	3/10/2004	soil	HASL300	REG	14331-83-0	Ac-228	2.27	pCi/g	G	0.69
383GB0901	3/10/2004	soil	HASL300	REG	14596-10-2	Am-241	2.83	pCi/g	J	0.65
383GB0901	3/10/2004	soil	HASL300	REG	10045-97-3	Cs-137	180	pCi/g	G	0
383GB0901	3/10/2004	soil	HASL300	REG	13966-00-2	K-40	29.2	pCi/g	G	2
383GB0901	3/10/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.12	pCi/g	J	0.74
383GB0901	3/10/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	11.3	pCi/g		0
383GB0901	3/10/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	61	pCi/g	M3	0
383GB0901	3/10/2004	soil	SR7500	REG	10098-97-2	Sr-90	18.8	pCi/g		0.3
383MB0100.5	6/12/2004	soil	EPA6010	REG	7440-38-2	Arsenic	0.7	mg/kg	B	1
383MB0100.5	6/12/2004	soil	EPA6010	REG	7440-39-3	Barium	470	mg/kg		10
383MB0100.5	6/12/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.49	mg/kg	B	0.51
383MB0100.5	6/12/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.099	mg/kg	B	0.51
383MB0100.5	6/12/2004	soil	EPA6010	REG	7440-47-3	Chromium	2	mg/kg		1
383MB0100.5	6/12/2004	soil	HASL300	REG	10045-97-3	Cs-137	0.94	pCi/g		0.05
383MB0100.5	6/12/2004	soil	HASL300	REG	13966-00-2	K-40	3.7	pCi/g		0.9
383MB0100.5	6/12/2004	soil	EPA6010	REG	7439-92-1	Lead	3.4	mg/kg		1.5
383MB0100.5	6/12/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.073	mg/kg	B	0.1
383MB0100.5	6/12/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	0.95	µg/kg	J,B	5.1
383MB0100.5	6/12/2004	soil	HASL300	REG	15092-94-1	Pb-212	0.35	pCi/g	J	0.12
383MB0100.5	6/12/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.3	pCi/g	J	0.16
383MB0100.5	6/12/2004	soil	EPA8260	REG	99-87-6	P-Isopropyltoluene	1.3	µg/kg	J	5.1
383MB0200.5	5/24/2004	soil	HASL300	REG	14331-83-0	Ac-228	0.85	pCi/g	G	0.34
383MB0200.5	5/24/2004	soil	EPA8260	REG	67-64-1	Acetone	7.9	µg/kg	J	22
383MB0200.5	5/24/2004	soil	EPA6010	REG	7440-38-2	Arsenic	1.9	mg/kg		1.1
383MB0200.5	5/24/2004	soil	EPA6010	REG	7440-39-3	Barium	910	mg/kg		11
383MB0200.5	5/24/2004	soil	EPA8270	REG	56-55-3	Benzo(A)Anthracene	38	µg/kg	J	720
383MB0200.5	5/24/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.47	mg/kg	B	0.54
383MB0200.5	5/24/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.64	pCi/g	G,J	0.24
383MB0200.5	5/24/2004	soil	EPA8270	REG	117-81-7	Bis(2-Ethylhexyl)Phthalate	170	µg/kg	J	720
383MB0200.5	5/24/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.74	mg/kg		0.54
383MB0200.5	5/24/2004	soil	EPA6010	REG	7440-47-3	Chromium	33	mg/kg		1.1
383MB0200.5	5/24/2004	soil	HASL300	REG	10045-97-3	Cs-137	18.4	pCi/g	G	0.1

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383MB0200.5	5/24/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	45	mg/kg	M,H	5.4
383MB0200.5	5/24/2004	soil	HASL300	REG	13966-00-2	K-40	9.8	pCi/g	G	1.3
383MB0200.5	5/24/2004	soil	EPA6010	REG	7439-92-1	Lead	39	mg/kg		1.6
383MB0200.5	5/24/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.052	mg/kg	B	0.11
383MB0200.5	5/24/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	0.88	µg/kg	J,B	5.4
383MB0200.5	5/24/2004	soil	HASL300	REG	15092-94-1	Pb-212	0.68	pCi/g	J	0.27
383MB0200.5	5/24/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.71	pCi/g	G,J	0.36
383MB0200.5	5/24/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.128	pCi/g		0.018
383MB0200.5	5/24/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	1.33	pCi/g		0.02
383MB0300.5	6/11/2004	soil	HASL300	REG	14331-83-0	Ac-228	0.5	pCi/g		0.39
383MB0300.5	6/11/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3.5	mg/kg		1
383MB0300.5	6/11/2004	soil	EPA6010	REG	7440-39-3	Barium	110	mg/kg		10
383MB0300.5	6/11/2004	soil	EPA8270	REG	56-55-3	Benzo(A)Anthracene	83	µg/kg	J	340
383MB0300.5	6/11/2004	soil	EPA8270	REG	50-32-8	Benzo(A)Pyrene	78	µg/kg	J	340
383MB0300.5	6/11/2004	soil	EPA8270	REG	205-99-2	Benzo(B)Fluoranthene	140	µg/kg	J	340
383MB0300.5	6/11/2004	soil	EPA8270	REG	191-24-2	Benzo(G,H,I)Perylene	68	µg/kg	J	340
383MB0300.5	6/11/2004	soil	EPA8270	REG	207-08-9	Benzo(K)Fluoranthene	55	µg/kg	J	340
383MB0300.5	6/11/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.44	mg/kg	B	0.52
383MB0300.5	6/11/2004	soil	HASL300	REG	14913-49-6	Bi-212	1.77	pCi/g	TI	1.03
383MB0300.5	6/11/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.39	pCi/g	J	0.21
383MB0300.5	6/11/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.5	mg/kg	B	0.52
383MB0300.5	6/11/2004	soil	EPA6010	REG	7440-47-3	Chromium	4.1	mg/kg		1
383MB0300.5	6/11/2004	soil	EPA8270	REG	218-01-9	Chrysene	120	µg/kg	J	340
383MB0300.5	6/11/2004	soil	HASL300	REG	10045-97-3	Cs-137	24.2	pCi/g		0.1
383MB0300.5	6/11/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	3.2	mg/kg	J	5.2
383MB0300.5	6/11/2004	soil	EPA8270	REG	206-44-0	Fluoranthene	110	µg/kg	J	340
383MB0300.5	6/11/2004	soil	EPA8270	REG	193-39-5	Indeno(1,2,3-Cd)Pyrene	45	µg/kg	J	340
383MB0300.5	6/11/2004	soil	HASL300	REG	13966-00-2	K-40	8.4	pCi/g		0.7
383MB0300.5	6/11/2004	soil	EPA6010	REG	7439-92-1	Lead	18	mg/kg		1.6
383MB0300.5	6/11/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.11	mg/kg		0.1
383MB0300.5	6/11/2004	soil	HASL300	REG	15092-94-1	Pb-212	0.79	pCi/g		0.24
383MB0300.5	6/11/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.53	pCi/g	J	0.33
383MB0300.5	6/11/2004	soil	EPA8270	REG	85-01-8	Phenanthrene	30	µg/kg	J	340
383MB0300.5	6/11/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.158	pCi/g		0.011
383MB0300.5	6/11/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	1.35	pCi/g		0.03

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383MB0300.5	6/11/2004	soil	EPA8270	REG	129-00-0	Pyrene	100	µg/kg	J	340
383MB0300.5	6/11/2004	soil	HASL300	REG	14913-50-9	TI-208	0.131	pCi/g		0.117
383MB0305.5	6/11/2004	soil	EPA6010	REG	7440-38-2	Arsenic	2.8	mg/kg		1
383MB0305.5	6/11/2004	soil	EPA6010	REG	7440-39-3	Barium	45	mg/kg		10
383MB0305.5	6/11/2004	soil	EPA8270	REG	56-55-3	Benzo(A)Anthracene	22	µg/kg	J	340
383MB0305.5	6/11/2004	soil	EPA8270	REG	50-32-8	Benzo(A)Pyrene	16	µg/kg	J	340
383MB0305.5	6/11/2004	soil	EPA8270	REG	205-99-2	Benzo(B)Fluoranthene	28	µg/kg	J	340
383MB0305.5	6/11/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.3	mg/kg	B	0.51
383MB0305.5	6/11/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.26	pCi/g	J	0.17
383MB0305.5	6/11/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.15	mg/kg	B	0.51
383MB0305.5	6/11/2004	soil	EPA6010	REG	7440-47-3	Chromium	2.8	mg/kg		1
383MB0305.5	6/11/2004	soil	EPA8270	REG	218-01-9	Chrysene	23	µg/kg	J	340
383MB0305.5	6/11/2004	soil	HASL300	REG	10045-97-3	Cs-137	4.65	pCi/g		0.09
383MB0305.5	6/11/2004	soil	EPA8270	REG	206-44-0	Fluoranthene	23	µg/kg	J	340
383MB0305.5	6/11/2004	soil	HASL300	REG	13966-00-2	K-40	2.5	pCi/g		1.08
383MB0305.5	6/11/2004	soil	EPA6010	REG	7439-92-1	Lead	6.1	mg/kg		1.5
383MB0305.5	6/11/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.2	mg/kg		0.1
383MB0305.5	6/11/2004	soil	HASL300	REG	15092-94-1	Pb-212	0.3	pCi/g		0.14
383MB0305.5	6/11/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.33	pCi/g	J	0.22
383MB0305.5	6/11/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.102	pCi/g		0.011
383MB0305.5	6/11/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.79	pCi/g		0.02
383MB0305.5	6/11/2004	soil	HASL300	REG	14913-50-9	TI-208	0.103	pCi/g		0.098
383MB0400.5	6/1/2004	soil	HASL300	REG	14331-83-0	Ac-228	2.89	pCi/g	G, TI	0.53
383MB0400.5	6/1/2004	soil	HASL300	REG	14596-10-2	Am-241	6.2	pCi/g	J	3.1
383MB0400.5	6/1/2004	soil	EPA6010	REG	7440-38-2	Arsenic	2.9	mg/kg		1.1
383MB0400.5	6/1/2004	soil	EPA6010	REG	7440-39-3	Barium	440	mg/kg		11
383MB0400.5	6/1/2004	soil	EPA8270	REG	56-55-3	Benzo(A)Anthracene	90	µg/kg	J	360
383MB0400.5	6/1/2004	soil	EPA8270	REG	50-32-8	Benzo(A)Pyrene	73	µg/kg	J	360
383MB0400.5	6/1/2004	soil	EPA8270	REG	205-99-2	Benzo(B)Fluoranthene	130	µg/kg	J	360
383MB0400.5	6/1/2004	soil	EPA8270	REG	207-08-9	Benzo(K)Fluoranthene	60	µg/kg	J	360
383MB0400.5	6/1/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.92	mg/kg		0.53
383MB0400.5	6/1/2004	soil	EPA6010	REG	7440-43-9	Cadmium	15	mg/kg		0.53
383MB0400.5	6/1/2004	soil	EPA6010	REG	7440-47-3	Chromium	2.2	mg/kg		1.1
383MB0400.5	6/1/2004	soil	EPA8270	REG	218-01-9	Chrysene	95	µg/kg	J	360
383MB0400.5	6/1/2004	soil	HASL300	REG	10045-97-3	Cs-137	393	pCi/g	M3,G	1

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383MB0400.5	6/1/2004	soil	EPA8270	REG	206-44-0	Fluoranthene	98	µg/kg	J	360
383MB0400.5	6/1/2004	soil	HASL300	REG	13966-00-2	K-40	34.2	pCi/g	G	1.6
383MB0400.5	6/1/2004	soil	EPA6010	REG	7439-92-1	Lead	28	mg/kg		0.32
383MB0400.5	6/1/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.22	pCi/g	J	1.07
383MB0400.5	6/1/2004	soil	EPA8270	REG	85-01-8	Phenanthrene	37	µg/kg	J	360
383MB0400.5	6/1/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	1.86	pCi/g		0.02
383MB0400.5	6/1/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	17.8	pCi/g	J	0
383MB0400.5	6/1/2004	soil	EPA8270	REG	129-00-0	Pyrene	91	µg/kg	J	360
383MB0400.5	6/1/2004	soil	EPA6010	REG	7782-49-2	Selenium	0.38	mg/kg	B	0.53
383MB0400.5	6/1/2004	soil	SR7500	REG	10098-97-2	Sr-90	2.5	pCi/g	Y1	0.13
383MB0500.5	6/3/2004	soil	HASL300	REG	14331-83-0	Ac-228	2	pCi/g	G	0.75
383MB0500.5	6/3/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3.2	mg/kg		1.1
383MB0500.5	6/3/2004	soil	EPA6010	REG	7440-39-3	Barium	2500	mg/kg		110
383MB0500.5	6/3/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1	mg/kg		0.56
383MB0500.5	6/3/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.1	pCi/g	G,J	0.45
383MB0500.5	6/3/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.2	mg/kg	B	0.56
383MB0500.5	6/3/2004	soil	EPA6010	REG	7440-47-3	Chromium	3	mg/kg		1.1
383MB0500.5	6/3/2004	soil	HASL300	REG	10045-97-3	Cs-137	29.3	pCi/g	G	0.2
383MB0500.5	6/3/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	160	mg/kg	Z, H	5.6
383MB0500.5	6/3/2004	soil	HASL300	REG	13966-00-2	K-40	24.6	pCi/g	G	1.9
383MB0500.5	6/3/2004	soil	EPA6010	REG	7439-92-1	Lead	29	mg/kg		0.34
383MB0500.5	6/3/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.016	mg/kg	B	0.11
383MB0500.5	6/3/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	1.1	µg/kg	J	5.6
383MB0500.5	6/3/2004	soil	EPA8260	REG	95-47-6	O-Xylene	1.2	µg/kg	J	5.6
383MB0500.5	6/3/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.03	pCi/g	J	0.33
383MB0500.5	6/3/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.37	pCi/g	G,J	0.52
383MB0500.5	6/3/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.191	pCi/g		0.011
383MB0500.5	6/3/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.73	pCi/g	J	0.02
383MB0500.5	6/3/2004	soil	SR7500	REG	10098-97-2	Sr-90	0.51	pCi/g	Y1	0.25
383MB0500.5	6/3/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.57	pCi/g	G	0.2
383MB0543.5	6/3/2004	soil	HASL300	REG	14331-83-0	Ac-228	2.81	pCi/g	G	0.78
383MB0543.5	6/3/2004	soil	HASL300	REG	14596-10-2	Am-241	28.8	pCi/g	J	1.6
383MB0543.5	6/3/2004	soil	EPA6010	REG	7440-38-2	Arsenic	2.2	mg/kg		1.2
383MB0543.5	6/3/2004	soil	EPA6010	REG	7440-39-3	Barium	85	mg/kg		12
383MB0543.5	6/3/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1	mg/kg		0.59

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383MB0543.5	6/3/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.078	mg/kg	B	0.59
383MB0543.5	6/3/2004	soil	EPA6010	REG	7440-47-3	Chromium	1.1	mg/kg	B	1.2
383MB0543.5	6/3/2004	soil	HASL300	REG	10045-97-3	Cs-137	1060	pCi/g	M3,G	0
383MB0543.5	6/3/2004	soil	HASL300	REG	14683-23-9	Eu-152	2.64	pCi/g	G	0.81
383MB0543.5	6/3/2004	soil	HASL300	REG	13966-00-2	K-40	39.8	pCi/g	G	1.7
383MB0543.5	6/3/2004	soil	EPA6010	REG	7439-92-1	Lead	22	mg/kg		0.36
383MB0543.5	6/3/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.0098	mg/kg	B	0.12
383MB0543.5	6/3/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	0.96	µg/kg	J	5.9
383MB0543.5	6/3/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	15.6	pCi/g	J	0
383MB0543.5	6/3/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	84	pCi/g	J	0
383MB0543.5	6/3/2004	soil	SR7500	REG	10098-97-2	Sr-90	34.1	pCi/g		0.2
383MB0586.0	6/3/2004	soil	EPA8260	REG	67-64-1	Acetone	8.8	µg/kg	J	20
383MB0586.0	6/3/2004	soil	EPA6010	REG	7440-38-2	Arsenic	0.31	mg/kg	B	1
383MB0586.0	6/3/2004	soil	EPA6010	REG	7440-39-3	Barium	4.8	mg/kg	B	10
383MB0586.0	6/3/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.2	mg/kg	B	0.5
383MB0586.0	6/3/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.042	mg/kg	B	0.5
383MB0586.0	6/3/2004	soil	EPA6010	REG	7440-47-3	Chromium	1.4	mg/kg		1
383MB0586.0	6/3/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.008	mg/kg	B	0.1
383MB0586.0	6/3/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	1.3	µg/kg	J	5
383MB0586.0	6/3/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.313	pCi/g	J	0.122
383MB0586.0	6/3/2004	soil	EPA6010	REG	7440-22-4	Silver	0.19	mg/kg	B	1
383MB0600.5	6/12/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.01	pCi/g	G	0.51
383MB0600.5	6/12/2004	soil	EPA8260	REG	67-64-1	Acetone	8.1	µg/kg	J	24
383MB0600.5	6/12/2004	soil	EPA6010	REG	7440-38-2	Arsenic	4.4	mg/kg		1.2
383MB0600.5	6/12/2004	soil	EPA6010	REG	7440-39-3	Barium	7000	mg/kg		600
383MB0600.5	6/12/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.94	mg/kg		0.6
383MB0600.5	6/12/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.09	pCi/g	G,J	0.29
383MB0600.5	6/12/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.13	mg/kg	B	0.6
383MB0600.5	6/12/2004	soil	EPA6010	REG	7440-47-3	Chromium	6.8	mg/kg		1.2
383MB0600.5	6/12/2004	soil	HASL300	REG	10045-97-3	Cs-137	0.6	pCi/g	G	0.13
383MB0600.5	6/12/2004	soil	HASL300	REG	13966-00-2	K-40	27.7	pCi/g	G	1.6
383MB0600.5	6/12/2004	soil	EPA6010	REG	7439-92-1	Lead	22	mg/kg		0.36
383MB0600.5	6/12/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.0086	mg/kg	B	0.12
383MB0600.5	6/12/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	0.99	µg/kg	J,B	6
383MB0600.5	6/12/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.6	pCi/g	J	0.29

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383MB0600.5	6/12/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.14	pCi/g	G,J	0.27
383MB0600.5	6/12/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.08	pCi/g		0.009
383MB0600.5	6/12/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.55	pCi/g	G,Tl	0.17
383MB0600.5X	6/12/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.68	pCi/g	G	0.73
383MB0600.5X	6/12/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3.4	mg/kg		1.2
383MB0600.5X	6/12/2004	soil	EPA6010	REG	7440-39-3	Barium	6600	mg/kg		590
383MB0600.5X	6/12/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.91	mg/kg		0.59
383MB0600.5X	6/12/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.15	pCi/g	G,J	0.4
383MB0600.5X	6/12/2004	soil	EPA8270	REG	117-81-7	Bis(2-Ethylhexyl)Phthalate	630	µg/kg		400
383MB0600.5X	6/12/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.12	mg/kg	B	0.59
383MB0600.5X	6/12/2004	soil	EPA6010	REG	7440-47-3	Chromium	5.8	mg/kg		1.2
383MB0600.5X	6/12/2004	soil	HASL300	REG	10045-97-3	Cs-137	0.67	pCi/g	G	0.16
383MB0600.5X	6/12/2004	soil	HASL300	REG	13966-00-2	K-40	30	pCi/g	G	1.7
383MB0600.5X	6/12/2004	soil	EPA6010	REG	7439-92-1	Lead	22	mg/kg		0.36
383MB0600.5X	6/12/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.011	mg/kg	B	0.12
383MB0600.5X	6/12/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	1.1	µg/kg	J,B	5.9
383MB0600.5X	6/12/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.85	pCi/g	J	0.24
383MB0600.5X	6/12/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.14	pCi/g	G,J	0.32
383MB0600.5X	6/12/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.068	pCi/g		0.023
383MB0600.5X	6/12/2004	soil	SR7500	REG	10098-97-2	Sr-90	0.53	pCi/g		0.23
383MB0600.5X	6/12/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.57	pCi/g	G	0.17
383MB0700.5	5/19/2004	soil	HASL300	REG	14331-83-0	Ac-228	0.72	pCi/g		0.39
383MB0700.5	5/19/2004	soil	EPA6010	REG	7440-38-2	Arsenic	2.4	mg/kg		1
383MB0700.5	5/19/2004	soil	EPA6010	REG	7440-39-3	Barium	73	mg/kg		10
383MB0700.5	5/19/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.5	mg/kg	B	0.52
383MB0700.5	5/19/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.63	pCi/g	J	0.23
383MB0700.5	5/19/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.065	mg/kg	B	0.52
383MB0700.5	5/19/2004	soil	EPA6010	REG	7440-47-3	Chromium	3.5	mg/kg		1
383MB0700.5	5/19/2004	soil	HASL300	REG	10045-97-3	Cs-137	0.58	pCi/g		0.09
383MB0700.5	5/19/2004	soil	EPA8270	REG	84-74-2	Di-N-Butyl Phthalate	26	µg/kg	J	350
383MB0700.5	5/19/2004	soil	HASL300	REG	13966-00-2	K-40	6.6	pCi/g		1.2
383MB0700.5	5/19/2004	soil	EPA6010	REG	7439-92-1	Lead	17	mg/kg		1.6
383MB0700.5	5/19/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.11	mg/kg		0.1
383MB0700.5	5/19/2004	soil	HASL300	REG	15092-94-1	Pb-212	0.68	pCi/g	J	0.14
383MB0700.5	5/19/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.74	pCi/g	J	0.15

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383MB0700.5	5/19/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.049	pCi/g	LT	0.01
383MB0700.5	5/19/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.217	pCi/g		0.01
383MB0700.5	5/19/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.166	pCi/g		0.085
383MB0800.5	5/24/2004	soil	EPA8260	REG	95-63-6	1,2,4-Trimethylbenzene	7.2	µg/kg		5.9
383MB0800.5	5/24/2004	soil	EPA8260	REG	108-67-8	1,3,5-Trimethylbenzene	7.2	µg/kg		5.9
383MB0800.5	5/24/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.69	pCi/g	G	0.71
383MB0800.5	5/24/2004	soil	EPA6010	REG	7440-38-2	Arsenic	4.1	mg/kg		1.2
383MB0800.5	5/24/2004	soil	EPA6010	REG	7440-39-3	Barium	5000	mg/kg		120
383MB0800.5	5/24/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.77	mg/kg		0.59
383MB0800.5	5/24/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.89	pCi/g	G,J	0.31
383MB0800.5	5/24/2004	soil	EPA6010	REG	7440-43-9	Cadmium	2.1	mg/kg		0.59
383MB0800.5	5/24/2004	soil	EPA6010	REG	7440-47-3	Chromium	8.6	mg/kg		1.2
383MB0800.5	5/24/2004	soil	HASL300	REG	10045-97-3	Cs-137	3.16	pCi/g	G	0.16
383MB0800.5	5/24/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	300	mg/kg	L,H,M	5.9
383MB0800.5	5/24/2004	soil	EPA8260	REG	100-41-4	Ethylbenzene	120	µg/kg		5.9
383MB0800.5	5/24/2004	soil	HASL300	REG	13966-00-2	K-40	22.2	pCi/g	G	2
383MB0800.5	5/24/2004	soil	EPA6010	REG	7439-92-1	Lead	53	mg/kg		0.35
383MB0800.5	5/24/2004	soil	EPA8260	REG	136777-61-2	M+P-Xylene	1500	µg/kg	E	5.9
383MB0800.5	5/24/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.055	mg/kg	B	0.12
383MB0800.5	5/24/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	1.9	µg/kg	J,B	5.9
383MB0800.5	5/24/2004	soil	EPA8260	REG	103-65-1	N-Propylbenzene	5.9	µg/kg		5.9
383MB0800.5	5/24/2004	soil	EPA8260	REG	95-47-6	O-Xylene	1000	µg/kg	E	5.9
383MB0800.5	5/24/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.9	pCi/g	J	0.31
383MB0800.5	5/24/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.95	pCi/g	G,J	0.32
383MB0800.5	5/24/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.156	pCi/g		0.009
383MB0800.5	5/24/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.66	pCi/g		0.02
383MB0800.5	5/24/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.47	pCi/g	G	0.21
383MB0800.5RR1	5/24/2004	soil	EPA8260	RE	100-41-4	Ethylbenzene	80	µg/kg		59
383MB0800.5RR1	5/24/2004	soil	EPA8260	RE	136777-61-2	M+P-Xylene	1200	µg/kg		59
383MB0800.5RR1	5/24/2004	soil	EPA8260	RE	75-09-2	Methylene Chloride	9.5	µg/kg	J,B	59
383MB0800.5RR1	5/24/2004	soil	EPA8260	RE	95-47-6	O-Xylene	780	µg/kg		59
383MB0831.0	5/24/2004	soil	EPA8260	REG	67-64-1	Acetone	8.9	µg/kg	J	20
383MB0831.0	5/24/2004	soil	EPA6010	REG	7440-38-2	Arsenic	0.73	mg/kg	B	1
383MB0831.0	5/24/2004	soil	EPA6010	REG	7440-39-3	Barium	7.3	mg/kg	B	10
383MB0831.0	5/24/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.25	mg/kg	B	0.51

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383MB0831.0	5/24/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.066	mg/kg	B	0.51
383MB0831.0	5/24/2004	soil	EPA6010	REG	7440-47-3	Chromium	0.94	mg/kg	B	1
383MB0831.0	5/24/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.094	mg/kg	B	0.1
383MB0831.0	5/24/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	0.82	µg/kg	J,B	5.1
383MB0831.0	5/24/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.238	pCi/g	J	0.118
383MB0900.5	6/12/2004	soil	HASL300	REG	14331-83-0	Ac-228	2.45	pCi/g	G	0.65
383MB0900.5	6/12/2004	soil	EPA6010	REG	7440-38-2	Arsenic	1.9	mg/kg		1.1
383MB0900.5	6/12/2004	soil	EPA6010	REG	7440-39-3	Barium	120	mg/kg		11
383MB0900.5	6/12/2004	soil	EPA6010	REG	7440-41-7	Beryllium	2.4	mg/kg		0.57
383MB0900.5	6/12/2004	soil	HASL300	REG	14733-03-0	Bi-214	2.08	pCi/g	G,J	0.38
383MB0900.5	6/12/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.1	mg/kg	B	0.57
383MB0900.5	6/12/2004	soil	EPA6010	REG	7440-47-3	Chromium	0.89	mg/kg	B	1.1
383MB0900.5	6/12/2004	soil	HASL300	REG	10045-97-3	Cs-137	0.27	pCi/g	LT,G	0.15
383MB0900.5	6/12/2004	soil	HASL300	REG	13966-00-2	K-40	30.9	pCi/g	G	2.1
383MB0900.5	6/12/2004	soil	EPA6010	REG	7439-92-1	Lead	19	mg/kg		0.34
383MB0900.5	6/12/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.0025	mg/kg	B	0.11
383MB0900.5	6/12/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	1.1	µg/kg	J,B	5.7
383MB0900.5	6/12/2004	soil	HASL300	REG	15092-94-1	Pb-212	3.37	pCi/g	J	0.27
383MB0900.5	6/12/2004	soil	HASL300	REG	15067-28-4	Pb-214	2.08	pCi/g	G,J	0.33
383MB0900.5	6/12/2004	soil	EPA6010	REG	7440-22-4	Silver	0.26	mg/kg	B	1.1
383MB0900.5	6/12/2004	soil	HASL300	REG	14913-50-9	Tl-208	1.02	pCi/g	G	0.19
383MB0912.5	6/12/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.81	pCi/g	G	0.56
383MB0912.5	6/12/2004	soil	HASL300	REG	14596-10-2	Am-241	1.39	pCi/g	J	0.67
383MB0912.5	6/12/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3.1	mg/kg		1.1
383MB0912.5	6/12/2004	soil	EPA6010	REG	7440-39-3	Barium	2100	mg/kg		550
383MB0912.5	6/12/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.4	mg/kg		0.55
383MB0912.5	6/12/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.17	pCi/g	G,J	0.51
383MB0912.5	6/12/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.26	mg/kg	B	0.55
383MB0912.5	6/12/2004	soil	EPA6010	REG	7440-47-3	Chromium	1.7	mg/kg		1.1
383MB0912.5	6/12/2004	soil	HASL300	REG	10045-97-3	Cs-137	135	pCi/g	G	0
383MB0912.5	6/12/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	14	mg/kg	M	5.5
383MB0912.5	6/12/2004	soil	HASL300	REG	13966-00-2	K-40	32	pCi/g	G	1.5
383MB0912.5	6/12/2004	soil	EPA6010	REG	7439-92-1	Lead	120	mg/kg		17
383MB0912.5	6/12/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.017	mg/kg	B	0.11
383MB0912.5	6/12/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	1.2	µg/kg	J,B	5.5

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383MB0912.5	6/12/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.02	pCi/g	J	0.65
383MB0912.5	6/12/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	3.32	pCi/g		0.01
383MB0912.5	6/12/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	4.11	pCi/g		0.02
383MB0912.5	6/12/2004	soil	EPA6010	REG	7782-49-2	Selenium	0.7	mg/kg		0.55
383MB0912.5	6/12/2004	soil	SR7500	REG	10098-97-2	Sr-90	5.5	pCi/g	J	0.2
383MB0912.5	6/12/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.68	pCi/g	G	0.39
383MB0913.5	6/12/2004	soil	EPA8260	REG	67-64-1	Acetone	5.7	µg/kg	J	20
383MB0913.5	6/12/2004	soil	EPA6010	REG	7440-39-3	Barium	14	mg/kg		10
383MB0913.5	6/12/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.2	mg/kg	B	0.5
383MB0913.5	6/12/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.039	mg/kg	B	0.5
383MB0913.5	6/12/2004	soil	EPA6010	REG	7440-47-3	Chromium	1.6	mg/kg		1
383MB0913.5	6/12/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.026	mg/kg	B	0.1
383MB0913.5	6/12/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	1	µg/kg	J,B	5
383MB0913.5	6/12/2004	soil	EPA6010	REG	7440-22-4	Silver	0.13	mg/kg	B	1
383MB1000.5	6/12/2004	soil	EPA8270	REG	91-57-6	2-Methylnaphthalene	68	µg/kg	J	380
383MB1000.5	6/12/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.35	pCi/g	G	0.45
383MB1000.5	6/12/2004	soil	EPA8270	REG	83-32-9	Acenaphthene	22	µg/kg	J	380
383MB1000.5	6/12/2004	soil	EPA8270	REG	208-96-8	Acenaphthylene	14	µg/kg	J	380
383MB1000.5	6/12/2004	soil	EPA8270	REG	120-12-7	Anthracene	170	µg/kg	J	380
383MB1000.5	6/12/2004	soil	EPA6010	REG	7440-38-2	Arsenic	4.7	mg/kg		1.1
383MB1000.5	6/12/2004	soil	EPA6010	REG	7440-39-3	Barium	4900	mg/kg		560
383MB1000.5	6/12/2004	soil	EPA8270	REG	56-55-3	Benzo(A)Anthracene	1200	µg/kg		380
383MB1000.5	6/12/2004	soil	EPA8270	REG	50-32-8	Benzo(A)Pyrene	1300	µg/kg		380
383MB1000.5	6/12/2004	soil	EPA8270	REG	205-99-2	Benzo(B)Fluoranthene	1700	µg/kg		380
383MB1000.5	6/12/2004	soil	EPA8270	REG	191-24-2	Benzo(G,H,I)Perylene	760	µg/kg		380
383MB1000.5	6/12/2004	soil	EPA8270	REG	207-08-9	Benzo(K)Fluoranthene	650	µg/kg		380
383MB1000.5	6/12/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.94	mg/kg		0.56
383MB1000.5	6/12/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.02	pCi/g	G,J	0.24
383MB1000.5	6/12/2004	soil	EPA8270	REG	117-81-7	Bis(2-Ethylhexyl)Phthalate	130	µg/kg	J	380
383MB1000.5	6/12/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.34	mg/kg	B	0.56
383MB1000.5	6/12/2004	soil	EPA8270	REG	86-74-8	Carbazole	57	µg/kg	J	380
383MB1000.5	6/12/2004	soil	EPA6010	REG	7440-47-3	Chromium	11	mg/kg		1.1
383MB1000.5	6/12/2004	soil	EPA8270	REG	218-01-9	Chrysene	1000	µg/kg		380
383MB1000.5	6/12/2004	soil	HASL300	REG	10045-97-3	Cs-137	0.33	pCi/g	LT,G	0.16
383MB1000.5	6/12/2004	soil	EPA8270	REG	132-64-9	Dibenzofuran	65	µg/kg	J	380

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383MB1000.5	6/12/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	9.9	mg/kg	Z,H	5.6
383MB1000.5	6/12/2004	soil	EPA8270	REG	206-44-0	Fluoranthene	1500	µg/kg		380
383MB1000.5	6/12/2004	soil	EPA8270	REG	86-73-7	Fluorene	16	µg/kg	J	380
383MB1000.5	6/12/2004	soil	EPA8270	REG	193-39-5	Indeno(1,2,3-Cd)Pyrene	630	µg/kg		380
383MB1000.5	6/12/2004	soil	HASL300	REG	13966-00-2	K-40	22.3	pCi/g	G	1
383MB1000.5	6/12/2004	soil	EPA6010	REG	7439-92-1	Lead	51	mg/kg		0.68
383MB1000.5	6/12/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.047	mg/kg	B	0.11
383MB1000.5	6/12/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	1.3	µg/kg	J,B	5.6
383MB1000.5	6/12/2004	soil	EPA8270	REG	91-20-3	Naphthalene	19	µg/kg	J	380
383MB1000.5	6/12/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.5	pCi/g	J	0.18
383MB1000.5	6/12/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.13	pCi/g	G,J	0.27
383MB1000.5	6/12/2004	soil	EPA8270	REG	85-01-8	Phenanthrene	350	µg/kg	J	380
383MB1000.5	6/12/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.117	pCi/g		0.022
383MB1000.5	6/12/2004	soil	EPA8270	REG	129-00-0	Pyrene	1600	µg/kg		380
383MB1000.5	6/12/2004	soil	EPA6010	REG	7782-49-2	Selenium	0.24	mg/kg	B	0.56
383MB1000.5	6/12/2004	soil	EPA6010	REG	7440-22-4	Silver	0.34	mg/kg	B	1.1
383MB1000.5	6/12/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.46	pCi/g	G	0.12
383MB1100.5	6/12/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.65	pCi/g	G	0.56
383MB1100.5	6/12/2004	soil	EPA6010	REG	7440-38-2	Arsenic	4.3	mg/kg		1.1
383MB1100.5	6/12/2004	soil	EPA6010	REG	7440-39-3	Barium	5300	mg/kg		550
383MB1100.5	6/12/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.4	mg/kg		0.55
383MB1100.5	6/12/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.3	pCi/g	G,J	0.27
383MB1100.5	6/12/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.23	mg/kg	B	0.55
383MB1100.5	6/12/2004	soil	EPA6010	REG	7440-47-3	Chromium	5.6	mg/kg		1.1
383MB1100.5	6/12/2004	soil	HASL300	REG	10045-97-3	Cs-137	0.87	pCi/g	G	0.15
383MB1100.5	6/12/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	13	mg/kg	M	5.5
383MB1100.5	6/12/2004	soil	HASL300	REG	13966-00-2	K-40	25.6	pCi/g	G	1.6
383MB1100.5	6/12/2004	soil	EPA6010	REG	7439-92-1	Lead	20	mg/kg		0.33
383MB1100.5	6/12/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.016	mg/kg	B	0.11
383MB1100.5	6/12/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	1.1	µg/kg	J,B	5.5
383MB1100.5	6/12/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.89	pCi/g	J	0.24
383MB1100.5	6/12/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.46	pCi/g	G,J	0.27
383MB1100.5	6/12/2004	soil	EPA6010	REG	7782-49-2	Selenium	0.74	mg/kg		0.55
383MB1100.5	6/12/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.66	pCi/g	G	0.14
383MB1114.5	6/12/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.54	pCi/g	G	0.52

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383MB1114.5	6/12/2004	soil	EPA6010	REG	7440-38-2	Arsenic	2.5	mg/kg		1.1
383MB1114.5	6/12/2004	soil	EPA6010	REG	7440-39-3	Barium	470	mg/kg		11
383MB1114.5	6/12/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.1	mg/kg		0.56
383MB1114.5	6/12/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.27	pCi/g	G,J	0.41
383MB1114.5	6/12/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.13	mg/kg	B	0.56
383MB1114.5	6/12/2004	soil	EPA6010	REG	7440-47-3	Chromium	1.4	mg/kg		1.1
383MB1114.5	6/12/2004	soil	HASL300	REG	10045-97-3	Cs-137	37.4	pCi/g	G	0.2
383MB1114.5	6/12/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	8.8	mg/kg	M	5.6
383MB1114.5	6/12/2004	soil	HASL300	REG	13966-00-2	K-40	37.7	pCi/g	G	1.5
383MB1114.5	6/12/2004	soil	EPA6010	REG	7439-92-1	Lead	15	mg/kg		0.34
383MB1114.5	6/12/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.006	mg/kg	B	0.11
383MB1114.5	6/12/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	1.2	µg/kg	J,B	5.6
383MB1114.5	6/12/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.86	pCi/g	J	0.39
383MB1114.5	6/12/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.24	pCi/g	G,J	0.57
383MB1114.5	6/12/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.206	pCi/g		0.021
383MB1114.5	6/12/2004	soil	EPA6010	REG	7782-49-2	Selenium	0.53	mg/kg	B	0.56
383MB1114.5	6/12/2004	soil	SR7500	REG	10098-97-2	Sr-90	1.08	pCi/g	Y1	0.25
383MB1114.5	6/12/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.7	pCi/g	G	0.21
383MB1119.5	6/12/2004	soil	EPA6010	REG	7440-38-2	Arsenic	1.4	mg/kg		1
383MB1119.5	6/12/2004	soil	EPA6010	REG	7440-39-3	Barium	36	mg/kg		10
383MB1119.5	6/12/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.23	mg/kg	B	0.51
383MB1119.5	6/12/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.17	mg/kg	B	0.51
383MB1119.5	6/12/2004	soil	EPA6010	REG	7440-47-3	Chromium	2.1	mg/kg		1
383MB1119.5	6/12/2004	soil	HASL300	REG	10045-97-3	Cs-137	0.121	pCi/g	LT	0.062
383MB1119.5	6/12/2004	soil	EPA6010	REG	7439-92-1	Lead	1.1	mg/kg	B	1.5
383MB1119.5	6/12/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.037	mg/kg	B	0.1
383MB1119.5	6/12/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	0.97	µg/kg	J,B	5.1
383MB1119.5	6/12/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.38	pCi/g	J	0.15
383MB1119.5	6/12/2004	soil	EPA6010	REG	7440-22-4	Silver	0.17	mg/kg	B	1
383MB1200.5	6/13/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.98	pCi/g	G	0.8
383MB1200.5	6/13/2004	soil	HASL300	REG	14682-66-7	Al-26	0.108	pCi/g	G,Tl	0.103
383MB1200.5	6/13/2004	soil	EPA6010	REG	7440-38-2	Arsenic	2.3	mg/kg		1.1
383MB1200.5	6/13/2004	soil	EPA6010	REG	7440-39-3	Barium	640	mg/kg		11
383MB1200.5	6/13/2004	soil	EPA6010	REG	7440-41-7	Beryllium	2.4	mg/kg		0.56
383MB1200.5	6/13/2004	soil	HASL300	REG	14913-49-6	Bi-212	2.5	pCi/g	G	2.1

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383MB1200.5	6/13/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.84	pCi/g	G,J	0.35
383MB1200.5	6/13/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.17	mg/kg	B	0.56
383MB1200.5	6/13/2004	soil	EPA6010	REG	7440-47-3	Chromium	2.1	mg/kg		1.1
383MB1200.5	6/13/2004	soil	HASL300	REG	10045-97-3	Cs-137	0.23	pCi/g	LT,G	0.14
383MB1200.5	6/13/2004	soil	HASL300	REG	13966-00-2	K-40	30.4	pCi/g	G	2
383MB1200.5	6/13/2004	soil	EPA6010	REG	7439-92-1	Lead	20	mg/kg		0.34
383MB1200.5	6/13/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.0079	mg/kg	B	0.11
383MB1200.5	6/13/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.99	pCi/g	G	0.26
383MB1200.5	6/13/2004	soil	HASL300	REG	15067-28-4	Pb-214	2.04	pCi/g	G,J	0.31
383MB1200.5	6/13/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.017	pCi/g	LT	0.009
383MB1200.5	6/13/2004	soil	EPA6010	REG	7782-49-2	Selenium	0.36	mg/kg	B	0.56
383MB1200.5	6/13/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.85	pCi/g	G	0.16
383MB1300.5	6/13/2004	soil	HASL300	REG	14331-83-0	Ac-228	2.05	pCi/g	G	0.58
383MB1300.5	6/13/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3.5	mg/kg		1.1
383MB1300.5	6/13/2004	soil	EPA6010	REG	7440-39-3	Barium	660	mg/kg		11
383MB1300.5	6/13/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.1	mg/kg		0.56
383MB1300.5	6/13/2004	soil	HASL300	REG	14913-49-6	Bi-212	2.3	pCi/g	G	2.1
383MB1300.5	6/13/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.07	pCi/g	G,J	0.27
383MB1300.5	6/13/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.03	mg/kg	B	0.56
383MB1300.5	6/13/2004	soil	EPA6010	REG	7440-47-3	Chromium	2	mg/kg		1.1
383MB1300.5	6/13/2004	soil	HASL300	REG	13966-00-2	K-40	25.7	pCi/g	G	1.5
383MB1300.5	6/13/2004	soil	EPA6010	REG	7439-92-1	Lead	13	mg/kg		0.33
383MB1300.5	6/13/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.013	mg/kg	B	0.11
383MB1300.5	6/13/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.1	pCi/g	G	0.26
383MB1300.5	6/13/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.97	pCi/g	G,J	0.28
383MB1300.5	6/13/2004	soil	EPA6010	REG	7782-49-2	Selenium	0.27	mg/kg	B	0.56
383MB1300.5	6/13/2004	soil	HASL300	REG	15065-10-8	Th-234	2.7	pCi/g	G,Tl	2
383MB1300.5	6/13/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.79	pCi/g	G	0.15
383MB1391.0	6/14/2004	soil	HASL300	REG	14331-83-0	Ac-228	0.71	pCi/g	G	0.4
383MB1391.0	6/14/2004	soil	EPA6010	REG	7440-38-2	Arsenic	2.3	mg/kg		1.1
383MB1391.0	6/14/2004	soil	EPA6010	REG	7440-39-3	Barium	67	mg/kg		11
383MB1391.0	6/14/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.65	mg/kg		0.54
383MB1391.0	6/14/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.65	pCi/g	G,J	0.2
383MB1391.0	6/14/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.092	mg/kg	B	0.54
383MB1391.0	6/14/2004	soil	EPA6010	REG	7440-47-3	Chromium	5.8	mg/kg		1.1

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383MB1391.0	6/14/2004	soil	HASL300	REG	13966-00-2	K-40	13	pCi/g	G	1.1
383MB1391.0	6/14/2004	soil	EPA6010	REG	7439-92-1	Lead	8.6	mg/kg		1.6
383MB1391.0	6/14/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.014	mg/kg	B	0.11
383MB1391.0	6/14/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	0.92	µg/kg	J,B	5.4
383MB1391.0	6/14/2004	soil	HASL300	REG	15092-94-1	Pb-212	0.8	pCi/g	G	0.17
383MB1391.0	6/14/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.76	pCi/g	G,J	0.18
383MB1391.0	6/14/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.02	pCi/g	LT	0.009
383MB1391.0	6/14/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.03	pCi/g	LT	0.009
383MB1391.0	6/14/2004	soil	EPA6010	REG	7440-22-4	Silver	1.6	mg/kg		1.1
383MB1391.0	6/14/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.183	pCi/g	G	0.089
383MB1400.5	6/14/2004	soil	HASL300	REG	14331-83-0	Ac-228	0.74	pCi/g		0.4
383MB1400.5	6/14/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3.4	mg/kg		1
383MB1400.5	6/14/2004	soil	EPA6010	REG	7440-39-3	Barium	300	mg/kg		10
383MB1400.5	6/14/2004	soil	EPA8270	REG	56-55-3	Benzo(A)Anthracene	18	µg/kg	J	340
383MB1400.5	6/14/2004	soil	EPA8270	REG	50-32-8	Benzo(A)Pyrene	15	µg/kg	J	340
383MB1400.5	6/14/2004	soil	EPA8270	REG	205-99-2	Benzo(B)Fluoranthene	27	µg/kg	J	340
383MB1400.5	6/14/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.53	mg/kg		0.52
383MB1400.5	6/14/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.46	pCi/g	J	0.29
383MB1400.5	6/14/2004	soil	EPA8270	REG	117-81-7	Bis(2-Ethylhexyl)Phthalate	72	µg/kg	J	340
383MB1400.5	6/14/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.3	mg/kg	B	0.52
383MB1400.5	6/14/2004	soil	EPA6010	REG	7440-47-3	Chromium	3.4	mg/kg		1
383MB1400.5	6/14/2004	soil	EPA8270	REG	218-01-9	Chrysene	21	µg/kg	J	340
383MB1400.5	6/14/2004	soil	HASL300	REG	10045-97-3	Cs-137	8.5	pCi/g		0.1
383MB1400.5	6/14/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	45	mg/kg	Z,H	5.1
383MB1400.5	6/14/2004	soil	EPA8270	REG	206-44-0	Fluoranthene	21	µg/kg	J	340
383MB1400.5	6/14/2004	soil	HASL300	REG	13966-00-2	K-40	9.5	pCi/g		1.6
383MB1400.5	6/14/2004	soil	EPA6010	REG	7439-92-1	Lead	20	mg/kg		1.5
383MB1400.5	6/14/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.21	mg/kg		0.1
383MB1400.5	6/14/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	0.83	µg/kg	J,B	5.2
383MB1400.5	6/14/2004	soil	HASL300	REG	15092-94-1	Pb-212	0.62	pCi/g		0.23
383MB1400.5	6/14/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.51	pCi/g	J	0.27
383MB1400.5	6/14/2004	soil	EPA8260	REG	99-87-6	P-Isopropyltoluene	13	µg/kg		5.2
383MB1400.5	6/14/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.88	pCi/g		0.02
383MB1400.5	6/14/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	2.84	pCi/g		0.02
383MB1400.5	6/14/2004	soil	SR7500	REG	10098-97-2	Sr-90	0.36	pCi/g	Y1,L	0.22

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383MB1400.5	6/14/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.222	pCi/g		0.11
383MB1403.5	6/14/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.9	pCi/g	G	0.52
383MB1403.5	6/14/2004	soil	HASL300	REG	14596-10-2	Am-241	1.57	pCi/g	G	0.7
383MB1403.5	6/14/2004	soil	EPA6010	REG	7440-38-2	Arsenic	2.1	mg/kg		1.1
383MB1403.5	6/14/2004	soil	EPA6010	REG	7440-39-3	Barium	87	mg/kg		11
383MB1403.5	6/14/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.3	mg/kg		0.57
383MB1403.5	6/14/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.24	pCi/g	G,J	0.79
383MB1403.5	6/14/2004	soil	EPA8270	REG	117-81-7	Bis(2-Ethylhexyl)Phthalate	93	µg/kg	J	380
383MB1403.5	6/14/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.069	mg/kg	B	0.57
383MB1403.5	6/14/2004	soil	EPA6010	REG	7440-47-3	Chromium	0.71	mg/kg	B	1.1
383MB1403.5	6/14/2004	soil	HASL300	REG	10045-97-3	Cs-137	240	pCi/g	G	0
383MB1403.5	6/14/2004	soil	HASL300	REG	13966-00-2	K-40	30.7	pCi/g	G	2.1
383MB1403.5	6/14/2004	soil	EPA6010	REG	7439-92-1	Lead	27	mg/kg		0.34
383MB1403.5	6/14/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.017	mg/kg	B	0.11
383MB1403.5	6/14/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	0.97	µg/kg	J,B	5.7
383MB1403.5	6/14/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.15	pCi/g	G	0.96
383MB1403.5	6/14/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.49	pCi/g	G,J	1.26
383MB1403.5	6/14/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	1.11	pCi/g		0.02
383MB1403.5	6/14/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	5.34	pCi/g		0.02
383MB1403.5	6/14/2004	soil	EPA6010	REG	7782-49-2	Selenium	0.3	mg/kg	B	0.57
383MB1403.5	6/14/2004	soil	SR7500	REG	10098-97-2	Sr-90	6.9	pCi/g	Y1	0.2
383MB1403.5	6/14/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.76	pCi/g	G	0.45
383MB1425.5	6/14/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.25	pCi/g	G	0.53
383MB1425.5	6/14/2004	soil	EPA6010	REG	7440-38-2	Arsenic	1.9	mg/kg		1.1
383MB1425.5	6/14/2004	soil	EPA6010	REG	7440-39-3	Barium	30	mg/kg		11
383MB1425.5	6/14/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.77	mg/kg		0.54
383MB1425.5	6/14/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.7	pCi/g	G,J	0.32
383MB1425.5	6/14/2004	soil	EPA8270	REG	117-81-7	Bis(2-Ethylhexyl)Phthalate	220	µg/kg	J	360
383MB1425.5	6/14/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.045	mg/kg	B	0.54
383MB1425.5	6/14/2004	soil	EPA6010	REG	7440-47-3	Chromium	1.3	mg/kg		1.1
383MB1425.5	6/14/2004	soil	HASL300	REG	10045-97-3	Cs-137	3.18	pCi/g	G	0.14
383MB1425.5	6/14/2004	soil	HASL300	REG	13966-00-2	K-40	19.6	pCi/g	G	1.7
383MB1425.5	6/14/2004	soil	EPA6010	REG	7439-92-1	Lead	95	mg/kg		1.6
383MB1425.5	6/14/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.013	mg/kg	B	0.11
383MB1425.5	6/14/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	0.86	µg/kg	J,B	5.4

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383MB1425.5	6/14/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.44	pCi/g	G	0.26
383MB1425.5	6/14/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.91	pCi/g	G,J	0.27
383MB1425.5	6/14/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.051	pCi/g		0.021
383MB1425.5	6/14/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.203	pCi/g		0.009
383MB1425.5	6/14/2004	soil	SR7500	REG	10098-97-2	Sr-90	0.33	pCi/g	Y1,L1	0.25
383MB1425.5	6/14/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.48	pCi/g	G	0.13
383MB1500.5	6/17/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.63	pCi/g	G	0.51
383MB1500.5	6/17/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3.2	mg/kg		1.1
383MB1500.5	6/17/2004	soil	EPA6010	REG	7440-39-3	Barium	3700	mg/kg		540
383MB1500.5	6/17/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.73	mg/kg		0.54
383MB1500.5	6/17/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.7	pCi/g	G,J	0.32
383MB1500.5	6/17/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.17	mg/kg	B	0.54
383MB1500.5	6/17/2004	soil	EPA6010	REG	7440-47-3	Chromium	3.7	mg/kg		1.1
383MB1500.5	6/17/2004	soil	HASL300	REG	10045-97-3	Cs-137	20.7	pCi/g	G	0.2
383MB1500.5	6/17/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	19	mg/kg	Z,H	5.4
383MB1500.5	6/17/2004	soil	HASL300	REG	13966-00-2	K-40	23.8	pCi/g	G	1.3
383MB1500.5	6/17/2004	soil	EPA6010	REG	7439-92-1	Lead	30	mg/kg		0.33
383MB1500.5	6/17/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.024	mg/kg	B	0.11
383MB1500.5	6/17/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	0.99	µg/kg	J,B	5.4
383MB1500.5	6/17/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.47	pCi/g	G	0.28
383MB1500.5	6/17/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.73	pCi/g	G,J	0.38
383MB1500.5	6/17/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.11	pCi/g		0.021
383MB1500.5	6/17/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	1.15	pCi/g		0.01
383MB1500.5	6/17/2004	soil	SR7500	REG	10098-97-2	Sr-90	0.67	pCi/g	Y1	0.24
383MB1500.5	6/17/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.33	pCi/g	G	0.19
383MH0136.5	5/25/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.67	pCi/g	G	0.69
383MH0136.5	5/25/2004	soil	EPA8260	REG	67-64-1	Acetone	10	µg/kg	J	24
383MH0136.5	5/25/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3.3	mg/kg		1.2
383MH0136.5	5/25/2004	soil	EPA6010	REG	7440-39-3	Barium	150	mg/kg		12
383MH0136.5	5/25/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.2	mg/kg		0.59
383MH0136.5	5/25/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.88	pCi/g	G,J	0.39
383MH0136.5	5/25/2004	soil	EPA6010	REG	7440-47-3	Chromium	2.3	mg/kg		1.2
383MH0136.5	5/25/2004	soil	HASL300	REG	10045-97-3	Cs-137	4.11	pCi/g	G	0.2
383MH0136.5	5/25/2004	soil	HASL300	REG	13966-00-2	K-40	26.9	pCi/g	G	2.1
383MH0136.5	5/25/2004	soil	EPA6010	REG	7439-92-1	Lead	14	mg/kg		0.35

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383MH0136.5	5/25/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.079	mg/kg	B	0.12
383MH0136.5	5/25/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.55	pCi/g	J	0.38
383MH0136.5	5/25/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.13	pCi/g	G,J	0.4
383MH0136.5	5/25/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.141	pCi/g		0.01
383MH0136.5	5/25/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.65	pCi/g	G	0.18
383MH0168.5	5/25/2004	soil	EPA6010	REG	7440-38-2	Arsenic	0.44	mg/kg	B	1
383MH0168.5	5/25/2004	soil	EPA6010	REG	7440-39-3	Barium	5.3	mg/kg	B	10
383MH0168.5	5/25/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.23	mg/kg	B	0.52
383MH0168.5	5/25/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.036	mg/kg	B	0.52
383MH0168.5	5/25/2004	soil	EPA6010	REG	7440-47-3	Chromium	1.3	mg/kg		1
383MH0168.5	5/25/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.052	mg/kg	B	0.1
383MH0168.5	5/25/2004	soil	EPA6010	REG	7440-22-4	Silver	0.57	mg/kg	B	1
383MH0313.0	5/25/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.9	pCi/g	G	0.73
383MH0313.0	5/25/2004	soil	EPA8260	REG	67-64-1	Acetone	10	µg/kg	J	24
383MH0313.0	5/25/2004	soil	EPA6010	REG	7440-38-2	Arsenic	1.7	mg/kg		1.2
383MH0313.0	5/25/2004	soil	EPA6010	REG	7440-39-3	Barium	250	mg/kg		12
383MH0313.0	5/25/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.5	mg/kg		0.61
383MH0313.0	5/25/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.27	pCi/g	G,J	0.38
383MH0313.0	5/25/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.045	mg/kg	B	0.61
383MH0313.0	5/25/2004	soil	EPA6010	REG	7440-47-3	Chromium	0.57	mg/kg	B	1.2
383MH0313.0	5/25/2004	soil	HASL300	REG	10045-97-3	Cs-137	0.43	pCi/g	LT,G	0.17
383MH0313.0	5/25/2004	soil	HASL300	REG	13966-00-2	K-40	35.9	pCi/g	G	1.7
383MH0313.0	5/25/2004	soil	EPA6010	REG	7439-92-1	Lead	35	mg/kg		0.37
383MH0313.0	5/25/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.0037	mg/kg	B	0.12
383MH0313.0	5/25/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.4	pCi/g	J	0.26
383MH0313.0	5/25/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.32	pCi/g	G,J	0.29
383MH0313.0	5/25/2004	soil	EPA6010	REG	7782-49-2	Selenium	0.31	mg/kg	B	0.61
383MH0313.0	5/25/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.81	pCi/g	G	0.19
383MH0353.5	5/25/2004	soil	HASL300	REG	14331-83-0	Ac-228	2.4	pCi/g	G	0.47
383MH0353.5	5/25/2004	soil	HASL300	REG	14596-10-2	Am-241	3.2	pCi/g	J	1.8
383MH0353.5	5/25/2004	soil	EPA6010	REG	7440-38-2	Arsenic	6	mg/kg		1.1
383MH0353.5	5/25/2004	soil	EPA6010	REG	7440-39-3	Barium	350	mg/kg		11
383MH0353.5	5/25/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.2	mg/kg		0.57
383MH0353.5	5/25/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.89	pCi/g	G,J	0.48
383MH0353.5	5/25/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.079	mg/kg	B	0.57

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383MH0353.5	5/25/2004	soil	EPA6010	REG	7440-47-3	Chromium	2.4	mg/kg		1.1
383MH0353.5	5/25/2004	soil	HASL300	REG	10045-97-3	Cs-137	144	pCi/g	G	0
383MH0353.5	5/25/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	3.5	mg/kg	J	5.7
383MH0353.5	5/25/2004	soil	HASL300	REG	13966-00-2	K-40	28.7	pCi/g	G	1.3
383MH0353.5	5/25/2004	soil	EPA6010	REG	7439-92-1	Lead	40	mg/kg		1.7
383MH0353.5	5/25/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.51	mg/kg		0.11
383MH0353.5	5/25/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.23	pCi/g	J	0.6
383MH0353.5	5/25/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.77	pCi/g		0.01
383MH0353.5	5/25/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	7.3	pCi/g		0
383MH0353.5	5/25/2004	soil	EPA6010	REG	7782-49-2	Selenium	0.67	mg/kg		0.57
383MH0353.5	5/25/2004	soil	SR7500	REG	10098-97-2	Sr-90	0.94	pCi/g		0.22
383MH0353.5	5/25/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.78	pCi/g	G	0.3
383MH0361.0	5/25/2004	soil	EPA6010	REG	7440-38-2	Arsenic	0.48	mg/kg	B	1
383MH0361.0	5/25/2004	soil	EPA6010	REG	7440-39-3	Barium	2.6	mg/kg	B	10
383MH0361.0	5/25/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.2	mg/kg	B	0.5
383MH0361.0	5/25/2004	soil	EPA6010	REG	7440-47-3	Chromium	1.2	mg/kg		1
383MH0361.0	5/25/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.016	mg/kg	B	0.1
383MH0361.0	5/25/2004	soil	EPA6010	REG	7440-22-4	Silver	0.23	mg/kg	B	1
383MH0432.0	5/22/2004	soil	HASL300	REG	14331-83-0	Ac-228	2.18	pCi/g	G	0.65
383MH0432.0	5/22/2004	soil	EPA6010	REG	7440-38-2	Arsenic	2.5	mg/kg		1.2
383MH0432.0	5/22/2004	soil	EPA6010	REG	7440-39-3	Barium	160	mg/kg		12
383MH0432.0	5/22/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.2	mg/kg		0.59
383MH0432.0	5/22/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.49	pCi/g	G,J	0.29
383MH0432.0	5/22/2004	soil	EPA6010	REG	7440-47-3	Chromium	2.2	mg/kg		1.2
383MH0432.0	5/22/2004	soil	HASL300	REG	10045-97-3	Cs-137	2.96	pCi/g	G	0.18
383MH0432.0	5/22/2004	soil	HASL300	REG	13966-00-2	K-40	36	pCi/g	G	1.8
383MH0432.0	5/22/2004	soil	EPA6010	REG	7439-92-1	Lead	15	mg/kg		0.36
383MH0432.0	5/22/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.0012	mg/kg	B	0.12
383MH0432.0	5/22/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.68	pCi/g	J	0.27
383MH0432.0	5/22/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.69	pCi/g	G,J	0.32
383MH0432.0	5/22/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.74	pCi/g	G	0.18
383MH0441.5	5/22/2004	soil	EPA6010	REG	7440-38-2	Arsenic	0.76	mg/kg	B	1
383MH0441.5	5/22/2004	soil	EPA6010	REG	7440-39-3	Barium	5	mg/kg	B	10
383MH0441.5	5/22/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.18	mg/kg	B	0.5
383MH0441.5	5/22/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.46	mg/kg	B	0.5

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383MH0441.5	5/22/2004	soil	EPA6010	REG	7440-47-3	Chromium	1.6	mg/kg		1
383MH0441.5	5/22/2004	soil	EPA6010	REG	7439-92-1	Lead	56	mg/kg		1.5
383MH0441.5	5/22/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.22	mg/kg		0.1
383MH0441.5	5/22/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	0.78	µg/kg	J,B	5
383MH0441.5	5/22/2004	soil	EPA6010	REG	7440-22-4	Silver	1.3	mg/kg		1
383MH0520.5	5/27/2004	soil	HASL300	REG	14331-83-0	Ac-228	2.01	pCi/g	G	0.57
383MH0520.5	5/27/2004	soil	EPA8260	REG	67-64-1	Acetone	7.2	µg/kg	J	23
383MH0520.5	5/27/2004	soil	EPA6010	REG	7440-38-2	Arsenic	2.2	mg/kg		1.2
383MH0520.5	5/27/2004	soil	EPA6010	REG	7440-39-3	Barium	63	mg/kg		12
383MH0520.5	5/27/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.2	mg/kg		0.59
383MH0520.5	5/27/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.38	pCi/g	G,J	0.33
383MH0520.5	5/27/2004	soil	EPA6010	REG	7440-47-3	Chromium	0.73	mg/kg	B	1.2
383MH0520.5	5/27/2004	soil	HASL300	REG	10045-97-3	Cs-137	3.95	pCi/g	G	0.18
383MH0520.5	5/27/2004	soil	HASL300	REG	13966-00-2	K-40	41.6	pCi/g	G	1.6
383MH0520.5	5/27/2004	soil	EPA6010	REG	7439-92-1	Lead	10	mg/kg		0.35
383MH0520.5	5/27/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.0014	mg/kg	B	0.12
383MH0520.5	5/27/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	1.7	µg/kg	J,B	5.9
383MH0520.5	5/27/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.48	pCi/g	J	0.25
383MH0520.5	5/27/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.65	pCi/g	G,J	0.34
383MH0520.5	5/27/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.189	pCi/g		0.017
383MH0520.5	5/27/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.73	pCi/g	G	0.14
383MH0559.5	5/27/2004	soil	HASL300	REG	14331-83-0	Ac-228	2.27	pCi/g	G,Tl	1.01
383MH0559.5	5/27/2004	soil	HASL300	REG	14596-10-2	Am-241	12.8	pCi/g	J	4.6
383MH0559.5	5/27/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3.6	mg/kg		1.3
383MH0559.5	5/27/2004	soil	EPA6010	REG	7440-39-3	Barium	56	mg/kg		13
383MH0559.5	5/27/2004	soil	EPA8270	REG	56-55-3	Benzo(A)Anthracene	140	µg/kg	J	420
383MH0559.5	5/27/2004	soil	EPA8270	REG	50-32-8	Benzo(A)Pyrene	120	µg/kg	J	420
383MH0559.5	5/27/2004	soil	EPA8270	REG	205-99-2	Benzo(B)Fluoranthene	180	µg/kg	J	420
383MH0559.5	5/27/2004	soil	EPA8270	REG	191-24-2	Benzo(G,H,I)Perylene	85	µg/kg	J	420
383MH0559.5	5/27/2004	soil	EPA8270	REG	207-08-9	Benzo(K)Fluoranthene	80	µg/kg	J	420
383MH0559.5	5/27/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.2	mg/kg		0.64
383MH0559.5	5/27/2004	soil	EPA6010	REG	7440-47-3	Chromium	2.5	mg/kg		1.3
383MH0559.5	5/27/2004	soil	EPA8270	REG	218-01-9	Chrysene	170	µg/kg	J	420
383MH0559.5	5/27/2004	soil	HASL300	REG	10045-97-3	Cs-137	471	pCi/g	M3,G	1
383MH0559.5	5/27/2004	soil	EPA8270	REG	206-44-0	Fluoranthene	150	µg/kg	J	420

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383MH0559.5	5/27/2004	soil	EPA8270	REG	193-39-5	Indeno(1,2,3-Cd)Pyrene	60	µg/kg	J	420
383MH0559.5	5/27/2004	soil	HASL300	REG	13966-00-2	K-40	31.2	pCi/g	G	2.6
383MH0559.5	5/27/2004	soil	EPA6010	REG	7439-92-1	Lead	20	mg/kg		0.38
383MH0559.5	5/27/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.013	mg/kg	B	0.13
383MH0559.5	5/27/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	2	µg/kg	J,B	6.4
383MH0559.5	5/27/2004	soil	EPA8270	REG	85-01-8	Phenanthrene	52	µg/kg	J	420
383MH0559.5	5/27/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	5.9	pCi/g		0
383MH0559.5	5/27/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	25.3	pCi/g		0
383MH0559.5	5/27/2004	soil	EPA8270	REG	129-00-0	Pyrene	310	µg/kg	J	420
383MH0559.5	5/27/2004	soil	EPA6010	REG	7782-49-2	Selenium	0.99	mg/kg		0.64
383MH0559.5	5/27/2004	soil	EPA6010	REG	7440-22-4	Silver	0.47	mg/kg	B	1.3
383MH0559.5	5/27/2004	soil	SR7500	REG	10098-97-2	Sr-90	54	pCi/g		0
383MH0568.5	5/27/2004	soil	HASL300	REG	14331-83-0	Ac-228	0.42	pCi/g		0.24
383MH0568.5	5/27/2004	soil	EPA6010	REG	7440-38-2	Arsenic	2.4	mg/kg		1
383MH0568.5	5/27/2004	soil	EPA6010	REG	7440-39-3	Barium	29	mg/kg		10
383MH0568.5	5/27/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.42	mg/kg	B	0.52
383MH0568.5	5/27/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.45	pCi/g	J	0.17
383MH0568.5	5/27/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.066	mg/kg	B	0.52
383MH0568.5	5/27/2004	soil	EPA6010	REG	7440-47-3	Chromium	4.2	mg/kg		1
383MH0568.5	5/27/2004	soil	HASL300	REG	10045-97-3	Cs-137	0.348	pCi/g	LT	0.072
383MH0568.5	5/27/2004	soil	HASL300	REG	13966-00-2	K-40	3.62	pCi/g		0.8
383MH0568.5	5/27/2004	soil	EPA6010	REG	7439-92-1	Lead	13	mg/kg		1.5
383MH0568.5	5/27/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.22	mg/kg		0.1
383MH0568.5	5/27/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	1.4	µg/kg	J,B	5.2
383MH0568.5	5/27/2004	soil	HASL300	REG	15092-94-1	Pb-212	0.29	pCi/g	J	0.14
383MH0568.5	5/27/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.5	pCi/g	J	0.14
383MH0568.5	5/27/2004	soil	EPA6010	REG	7440-22-4	Silver	0.5	mg/kg	B	1
383MH0600.5	6/11/2004	soil	HASL300	REG	14331-83-0	Ac-228	0.43	pCi/g	TI	0.31
383MH0600.5	6/11/2004	soil	EPA6010	REG	7440-38-2	Arsenic	1.8	mg/kg		1
383MH0600.5	6/11/2004	soil	EPA6010	REG	7440-39-3	Barium	370	mg/kg		10
383MH0600.5	6/11/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.33	mg/kg	B	0.51
383MH0600.5	6/11/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.49	pCi/g	J	0.18
383MH0600.5	6/11/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.44	mg/kg	B	0.51
383MH0600.5	6/11/2004	soil	EPA6010	REG	7440-47-3	Chromium	2.6	mg/kg		1
383MH0600.5	6/11/2004	soil	HASL300	REG	10045-97-3	Cs-137	1.65	pCi/g		0.08

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383MH0600.5	6/11/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	700	mg/kg	M	5.1
383MH0600.5	6/11/2004	soil	HASL300	REG	13966-00-2	K-40	2.68	pCi/g		0.91
383MH0600.5	6/11/2004	soil	EPA6010	REG	7439-92-1	Lead	5.9	mg/kg		1.5
383MH0600.5	6/11/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.067	mg/kg	B	0.1
383MH0600.5	6/11/2004	soil	HASL300	REG	15092-94-1	Pb-212	0.29	pCi/g		0.14
383MH0600.5	6/11/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.58	pCi/g	J	0.14
383MH0600.5	6/11/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.04	pCi/g	LT	0.02
383MH0600.5	6/11/2004	soil	EPA6010	REG	7440-22-4	Silver	0.17	mg/kg	B	1
383MH0600.5	6/11/2004	soil	SR7500	REG	10098-97-2	Sr-90	0.048	pCi/g	Y1,U	0.182
383MH0600.5	6/11/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.093	pCi/g		0.075
383MH0722.5	5/21/2004	soil	HASL300	REG	14331-83-0	Ac-228	2.1	pCi/g	G	0.61
383MH0722.5	5/21/2004	soil	EPA8260	REG	67-64-1	Acetone	8.3	µg/kg	J	23
383MH0722.5	5/21/2004	soil	EPA6010	REG	7440-38-2	Arsenic	2.5	mg/kg		1.2
383MH0722.5	5/21/2004	soil	EPA6010	REG	7440-39-3	Barium	200	mg/kg		12
383MH0722.5	5/21/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.3	mg/kg		0.59
383MH0722.5	5/21/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.38	pCi/g	G,J	0.41
383MH0722.5	5/21/2004	soil	EPA6010	REG	7440-47-3	Chromium	2	mg/kg		1.2
383MH0722.5	5/21/2004	soil	HASL300	REG	10045-97-3	Cs-137	26.9	pCi/g	G	0.2
383MH0722.5	5/21/2004	soil	HASL300	REG	13966-00-2	K-40	33.2	pCi/g	G	2.2
383MH0722.5	5/21/2004	soil	EPA6010	REG	7439-92-1	Lead	12	mg/kg		0.35
383MH0722.5	5/21/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.055	mg/kg	B	0.12
383MH0722.5	5/21/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.48	pCi/g	J	0.37
383MH0722.5	5/21/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.28	pCi/g	G,J	0.46
383MH0722.5	5/21/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.173	pCi/g		0.01
383MH0722.5	5/21/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.79	pCi/g	G	0.24
383MH0723.5	5/21/2004	soil	HASL300	REG	14331-83-0	Ac-228	2.01	pCi/g	G	0.84
383MH0723.5	5/21/2004	soil	EPA8260	REG	67-64-1	Acetone	10	µg/kg	J	23
383MH0723.5	5/21/2004	soil	EPA6010	REG	7440-38-2	Arsenic	2.5	mg/kg		1.2
383MH0723.5	5/21/2004	soil	EPA6010	REG	7440-39-3	Barium	200	mg/kg		12
383MH0723.5	5/21/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.3	mg/kg		0.59
383MH0723.5	5/21/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.32	pCi/g	G,J	0.69
383MH0723.5	5/21/2004	soil	EPA6010	REG	7440-47-3	Chromium	1.7	mg/kg		1.2
383MH0723.5	5/21/2004	soil	HASL300	REG	10045-97-3	Cs-137	83.7	pCi/g	G	0.3
383MH0723.5	5/21/2004	soil	HASL300	REG	13966-00-2	K-40	40.7	pCi/g	G	1.8
383MH0723.5	5/21/2004	soil	EPA6010	REG	7439-92-1	Lead	13	mg/kg		0.35

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383MH0723.5	5/21/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.0021	mg/kg	B	0.12
383MH0723.5	5/21/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	0.98	µg/kg	J,B	5.9
383MH0723.5	5/21/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.48	pCi/g	J	0.55
383MH0723.5	5/21/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.059	pCi/g		0.021
383MH0723.5	5/21/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.262	pCi/g		0.009
383MH0723.5	5/21/2004	soil	SR7500	REG	10098-97-2	Sr-90	0.85	pCi/g		0.19
383MH0723.5	5/21/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.87	pCi/g	G	0.35
383MH0767.5	5/21/2004	soil	EPA6010	REG	7440-38-2	Arsenic	1.1	mg/kg		1
383MH0767.5	5/21/2004	soil	EPA6010	REG	7440-39-3	Barium	24	mg/kg		10
383MH0767.5	5/21/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.28	mg/kg	B	0.51
383MH0767.5	5/21/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.27	pCi/g	J	0.14
383MH0767.5	5/21/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.046	mg/kg	B	0.51
383MH0767.5	5/21/2004	soil	EPA6010	REG	7440-47-3	Chromium	2.5	mg/kg		1
383MH0767.5	5/21/2004	soil	HASL300	REG	13966-00-2	K-40	2.21	pCi/g		0.83
383MH0767.5	5/21/2004	soil	EPA6010	REG	7439-92-1	Lead	8.9	mg/kg		1.5
383MH0767.5	5/21/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.056	mg/kg	B	0.1
383MH0767.5	5/21/2004	soil	HASL300	REG	15092-94-1	Pb-212	0.212	pCi/g	J	0.108
383MH0767.5	5/21/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.37	pCi/g	J	0.14
383MH0767.5	5/21/2004	soil	EPA6010	REG	7440-22-4	Silver	0.35	mg/kg	B	1
383MH0832.5	5/26/2004	soil	EPA6010	REG	7440-38-2	Arsenic	2.7	mg/kg		1
383MH0832.5	5/26/2004	soil	EPA6010	REG	7440-39-3	Barium	22	mg/kg		10
383MH0832.5	5/26/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.42	mg/kg	B	0.52
383MH0832.5	5/26/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.56	pCi/g	G,J	0.26
383MH0832.5	5/26/2004	soil	EPA6010	REG	7440-47-3	Chromium	2.1	mg/kg		1
383MH0832.5	5/26/2004	soil	HASL300	REG	10045-97-3	Cs-137	0.84	pCi/g	G	0.12
383MH0832.5	5/26/2004	soil	HASL300	REG	13966-00-2	K-40	7.1	pCi/g	G	1.5
383MH0832.5	5/26/2004	soil	EPA6010	REG	7439-92-1	Lead	6.3	mg/kg		1.6
383MH0832.5	5/26/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.055	mg/kg	B	0.1
383MH0832.5	5/26/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	1.4	µg/kg	J,B	5.2
383MH0832.5	5/26/2004	soil	HASL300	REG	15092-94-1	Pb-212	0.56	pCi/g	J	0.17
383MH0832.5	5/26/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.64	pCi/g	G,J	0.21
383MH0858.0	5/26/2004	soil	EPA8260	REG	67-64-1	Acetone	7.3	µg/kg	J	20
383MH0858.0	5/26/2004	soil	EPA6010	REG	7440-38-2	Arsenic	0.68	mg/kg	B	1
383MH0858.0	5/26/2004	soil	EPA6010	REG	7440-39-3	Barium	3	mg/kg	B	10
383MH0858.0	5/26/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.19	mg/kg	B	0.5

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383MH0858.0	5/26/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.026	mg/kg	B	0.5
383MH0858.0	5/26/2004	soil	EPA6010	REG	7440-47-3	Chromium	1.2	mg/kg		1
383MH0858.0	5/26/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.017	mg/kg	B	0.1
383MH0916.5	6/11/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.5	pCi/g	G	0.49
383MH0916.5	6/11/2004	soil	EPA6010	REG	7440-38-2	Arsenic	2.4	mg/kg		1.1
383MH0916.5	6/11/2004	soil	EPA6010	REG	7440-39-3	Barium	81	mg/kg		11
383MH0916.5	6/11/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.67	mg/kg		0.55
383MH0916.5	6/11/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.71	pCi/g	G,J	0.27
383MH0916.5	6/11/2004	soil	EPA6010	REG	7440-47-3	Chromium	4.3	mg/kg		1.1
383MH0916.5	6/11/2004	soil	HASL300	REG	10045-97-3	Cs-137	0.15	pCi/g	LT,G	0.143
383MH0916.5	6/11/2004	soil	HASL300	REG	13966-00-2	K-40	27	pCi/g	G	1.2
383MH0916.5	6/11/2004	soil	EPA6010	REG	7439-92-1	Lead	9.6	mg/kg		0.33
383MH0916.5	6/11/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.088	mg/kg	B	0.11
383MH0916.5	6/11/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.83	pCi/g	G	0.18
383MH0916.5	6/11/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.69	pCi/g	G,J	0.23
383MH0916.5	6/11/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.016	pCi/g	LT	0.009
383MH0916.5	6/11/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.64	pCi/g	G	0.11
383MH0922.5	6/11/2004	soil	HASL300	REG	14331-83-0	Ac-228	2.14	pCi/g	G	0.54
383MH0922.5	6/11/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3.8	mg/kg		1.1
383MH0922.5	6/11/2004	soil	EPA6010	REG	7440-39-3	Barium	160	mg/kg		11
383MH0922.5	6/11/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1	mg/kg		0.56
383MH0922.5	6/11/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.92	pCi/g	G,J	0.26
383MH0922.5	6/11/2004	soil	EPA6010	REG	7440-47-3	Chromium	4.3	mg/kg		1.1
383MH0922.5	6/11/2004	soil	HASL300	REG	14391-16-3	Eu-155	0.32	pCi/g	G,Tl	0.3
383MH0922.5	6/11/2004	soil	HASL300	REG	13966-00-2	K-40	31.7	pCi/g	G	1.4
383MH0922.5	6/11/2004	soil	EPA6010	REG	7439-92-1	Lead	13	mg/kg		0.33
383MH0922.5	6/11/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.07	mg/kg	B	0.11
383MH0922.5	6/11/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.27	pCi/g	G	0.23
383MH0922.5	6/11/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.72	pCi/g	G,J	0.25
383MH0922.5	6/11/2004	soil	EPA6010	REG	7782-49-2	Selenium	0.26	mg/kg	B	0.56
383MH0922.5	6/11/2004	soil	EPA6010	REG	7440-22-4	Silver	0.15	mg/kg	B	1.1
383MH0922.5	6/11/2004	soil	HASL300	REG	15065-10-8	Th-234	1.8	pCi/g	G	1.67
383MH0922.5	6/11/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.76	pCi/g	G	0.15
383MH1002.0	5/22/2004	soil	HASL300	REG	14331-83-0	Ac-228	0.7	pCi/g	G	0.31
383MH1002.0	5/22/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3	mg/kg		1.1

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383MH1002.0	5/22/2004	soil	EPA6010	REG	7440-39-3	Barium	190	mg/kg		11
383MH1002.0	5/22/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.78	mg/kg		0.53
383MH1002.0	5/22/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.48	pCi/g	G,J	0.18
383MH1002.0	5/22/2004	soil	EPA6010	REG	7440-47-3	Chromium	2.8	mg/kg		1.1
383MH1002.0	5/22/2004	soil	HASL300	REG	10045-97-3	Cs-137	1.04	pCi/g	G	0.09
383MH1002.0	5/22/2004	soil	HASL300	REG	13966-00-2	K-40	13.8	pCi/g	G	1
383MH1002.0	5/22/2004	soil	EPA6010	REG	7439-92-1	Lead	17	mg/kg		1.6
383MH1002.0	5/22/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.056	mg/kg	B	0.11
383MH1002.0	5/22/2004	soil	HASL300	REG	15092-94-1	Pb-212	0.83	pCi/g	J	0.15
383MH1002.0	5/22/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.61	pCi/g	G,J	0.17
383MH1002.0	5/22/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.293	pCi/g	G	0.078
383MH1011.5	5/22/2004	soil	EPA6010	REG	7440-38-2	Arsenic	1.9	mg/kg		1.1
383MH1011.5	5/22/2004	soil	EPA6010	REG	7440-39-3	Barium	56	mg/kg		11
383MH1011.5	5/22/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.47	mg/kg	B	0.54
383MH1011.5	5/22/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.67	pCi/g	G,J	0.27
383MH1011.5	5/22/2004	soil	EPA6010	REG	7440-47-3	Chromium	3.8	mg/kg		1.1
383MH1011.5	5/22/2004	soil	HASL300	REG	10045-97-3	Cs-137	0.42	pCi/g	LT,G	0.1
383MH1011.5	5/22/2004	soil	HASL300	REG	13966-00-2	K-40	5.3	pCi/g	G	1.5
383MH1011.5	5/22/2004	soil	EPA6010	REG	7439-92-1	Lead	5.1	mg/kg		1.6
383MH1011.5	5/22/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.073	mg/kg	B	0.11
383MH1011.5	5/22/2004	soil	HASL300	REG	15092-94-1	Pb-212	0.49	pCi/g	J	0.21
383MH1011.5	5/22/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.56	pCi/g	G,J	0.25
383MH1011.5	5/22/2004	soil	EPA6010	REG	7440-22-4	Silver	0.076	mg/kg	B	1.1
383MH1100.5	6/11/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.47	pCi/g	G	0.49
383MH1100.5	6/11/2004	soil	HASL300	REG	14596-10-2	Am-241	0.95	pCi/g	G	0.33
383MH1100.5	6/11/2004	soil	EPA6010	REG	7440-38-2	Arsenic	5.7	mg/kg		1.1
383MH1100.5	6/11/2004	soil	EPA6010	REG	7440-39-3	Barium	210	mg/kg		11
383MH1100.5	6/11/2004	soil	EPA8270	REG	56-55-3	Benzo(A)Anthracene	130	µg/kg	J	350
383MH1100.5	6/11/2004	soil	EPA8270	REG	50-32-8	Benzo(A)Pyrene	110	µg/kg	J	350
383MH1100.5	6/11/2004	soil	EPA8270	REG	205-99-2	Benzo(B)Fluoranthene	210	µg/kg	J	350
383MH1100.5	6/11/2004	soil	EPA8270	REG	191-24-2	Benzo(G,H,I)Perylene	83	µg/kg	J	350
383MH1100.5	6/11/2004	soil	EPA8270	REG	207-08-9	Benzo(K)Fluoranthene	94	µg/kg	J	350
383MH1100.5	6/11/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.71	mg/kg		0.53
383MH1100.5	6/11/2004	soil	HASL300	REG	14913-49-6	Bi-212	2.1	pCi/g	G,Tl	1.8
383MH1100.5	6/11/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.86	pCi/g	G,J	0.41

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383MH1100.5	6/11/2004	soil	EPA8270	REG	117-81-7	Bis(2-Ethylhexyl)Phthalate	110	µg/kg	J	350
383MH1100.5	6/11/2004	soil	EPA8270	REG	85-68-7	Butyl Benzyl Phthalate	35	µg/kg	J	350
383MH1100.5	6/11/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.35	mg/kg	B	0.53
383MH1100.5	6/11/2004	soil	EPA6010	REG	7440-47-3	Chromium	6.9	mg/kg		1.1
383MH1100.5	6/11/2004	soil	EPA8270	REG	218-01-9	Chrysene	170	µg/kg	J	350
383MH1100.5	6/11/2004	soil	HASL300	REG	10045-97-3	Cs-137	47.3	pCi/g	G	0.2
383MH1100.5	6/11/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	81	mg/kg	Z,H	5.3
383MH1100.5	6/11/2004	soil	EPA8270	REG	84-74-2	Di-N-Butyl Phthalate	26	µg/kg	J	350
383MH1100.5	6/11/2004	soil	EPA8270	REG	206-44-0	Fluoranthene	170	µg/kg	J	350
383MH1100.5	6/11/2004	soil	EPA8270	REG	193-39-5	Indeno(1,2,3-Cd)Pyrene	54	µg/kg	J	350
383MH1100.5	6/11/2004	soil	HASL300	REG	13966-00-2	K-40	19.6	pCi/g	G	1.4
383MH1100.5	6/11/2004	soil	EPA6010	REG	7439-92-1	Lead	38	mg/kg		1.6
383MH1100.5	6/11/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.033	mg/kg	B	0.11
383MH1100.5	6/11/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.67	pCi/g	G	0.38
383MH1100.5	6/11/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.8	pCi/g	G,J	0.48
383MH1100.5	6/11/2004	soil	EPA8270	REG	85-01-8	Phenanthrene	56	µg/kg	J	350
383MH1100.5	6/11/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.46	pCi/g		0.01
383MH1100.5	6/11/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	3.04	pCi/g		0.03
383MH1100.5	6/11/2004	soil	EPA8270	REG	129-00-0	Pyrene	190	µg/kg	J	350
383MH1100.5	6/11/2004	soil	SR7500	REG	10098-97-2	Sr-90	0.62	pCi/g	Y1	0.19
383MH1100.5	6/11/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.36	pCi/g	G	0.18
383MH1104.0	6/11/2004	soil	EPA6010	REG	7440-38-2	Arsenic	0.69	mg/kg	B	1
383MH1104.0	6/11/2004	soil	EPA6010	REG	7440-39-3	Barium	15	mg/kg		10
383MH1104.0	6/11/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.42	mg/kg	B	0.51
383MH1104.0	6/11/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.33	pCi/g	J	0.22
383MH1104.0	6/11/2004	soil	EPA8270	REG	117-81-7	Bis(2-Ethylhexyl)Phthalate	84	µg/kg	J	340
383MH1104.0	6/11/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.037	mg/kg	B	0.51
383MH1104.0	6/11/2004	soil	EPA6010	REG	7440-47-3	Chromium	2.1	mg/kg		1
383MH1104.0	6/11/2004	soil	HASL300	REG	10045-97-3	Cs-137	1.83	pCi/g		0.1
383MH1104.0	6/11/2004	soil	EPA6010	REG	7439-92-1	Lead	4	mg/kg		1.5
383MH1104.0	6/11/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.06	mg/kg	B	0.1
383MH1104.0	6/11/2004	soil	HASL300	REG	15092-94-1	Pb-212	0.212	pCi/g		0.134
383MH1104.0	6/11/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.41	pCi/g	J	0.18
383MH1104.0	6/11/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.06	pCi/g		0.009
383MH1104.0	6/11/2004	soil	EPA6010	REG	7440-22-4	Silver	0.071	mg/kg	B	1

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383MH1215.0	5/23/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.9	pCi/g	G	0.49
383MH1215.0	5/23/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3.2	mg/kg		1.2
383MH1215.0	5/23/2004	soil	EPA6010	REG	7440-39-3	Barium	110	mg/kg		12
383MH1215.0	5/23/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.1	mg/kg		0.58
383MH1215.0	5/23/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.22	pCi/g	G,J	0.32
383MH1215.0	5/23/2004	soil	EPA6010	REG	7440-47-3	Chromium	0.98	mg/kg	B	1.2
383MH1215.0	5/23/2004	soil	HASL300	REG	10045-97-3	Cs-137	23.5	pCi/g	G	0.1
383MH1215.0	5/23/2004	soil	HASL300	REG	13966-00-2	K-40	36.7	pCi/g	G	1.3
383MH1215.0	5/23/2004	soil	EPA6010	REG	7439-92-1	Lead	12	mg/kg		0.35
383MH1215.0	5/23/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.011	mg/kg	B	0.12
383MH1215.0	5/23/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	0.88	µg/kg	J,B	5.8
383MH1215.0	5/23/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.72	pCi/g	J	0.33
383MH1215.0	5/23/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.26	pCi/g	G,J	0.35
383MH1215.0	5/23/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.072	pCi/g		0.009
383MH1215.0	5/23/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.74	pCi/g	J	0.01
383MH1215.0	5/23/2004	soil	EPA6010	REG	7782-49-2	Selenium	0.78	mg/kg		0.58
383MH1215.0	5/23/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.68	pCi/g	G	0.14
383MH1220.5	5/23/2004	soil	EPA6010	REG	7440-38-2	Arsenic	1.5	mg/kg		1.1
383MH1220.5	5/23/2004	soil	EPA6010	REG	7440-39-3	Barium	8.7	mg/kg	B	11
383MH1220.5	5/23/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.19	mg/kg	B	0.53
383MH1220.5	5/23/2004	soil	EPA6010	REG	7440-43-9	Cadmium	1	mg/kg		0.53
383MH1220.5	5/23/2004	soil	EPA6010	REG	7440-47-3	Chromium	1	mg/kg	B	1.1
383MH1220.5	5/23/2004	soil	EPA6010	REG	7439-92-1	Lead	18	mg/kg		1.6
383MH1220.5	5/23/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.19	mg/kg		0.11
383MH1220.5	5/23/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	0.83	µg/kg	J,B	5.3
383MH1220.5	5/23/2004	soil	EPA6010	REG	7440-22-4	Silver	0.71	mg/kg	B	1.1
383MH1306.5	5/25/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.82	pCi/g	G	0.78
383MH1306.5	5/25/2004	soil	EPA8260	REG	67-64-1	Acetone	7.3	µg/kg	J	24
383MH1306.5	5/25/2004	soil	EPA6010	REG	7440-38-2	Arsenic	1.8	mg/kg		1.2
383MH1306.5	5/25/2004	soil	EPA6010	REG	7440-39-3	Barium	68	mg/kg		12
383MH1306.5	5/25/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.2	mg/kg		0.61
383MH1306.5	5/25/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.18	pCi/g	G,J	0.35
383MH1306.5	5/25/2004	soil	EPA6010	REG	7440-47-3	Chromium	0.49	mg/kg	B	1.2
383MH1306.5	5/25/2004	soil	HASL300	REG	10045-97-3	Cs-137	0.57	pCi/g	G	0.2
383MH1306.5	5/25/2004	soil	HASL300	REG	13966-00-2	K-40	43.8	pCi/g	G	2.7

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383MH1306.5	5/25/2004	soil	EPA6010	REG	7439-92-1	Lead	12	mg/kg		0.36
383MH1306.5	5/25/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.0018	mg/kg	B	0.12
383MH1306.5	5/25/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.91	pCi/g	J	0.33
383MH1306.5	5/25/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.53	pCi/g	G,J	0.4
383MH1306.5	5/25/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.8	pCi/g	G	0.22
383MH1320.5	5/25/2004	soil	EPA8260	REG	67-64-1	Acetone	10	µg/kg	J	20
383MH1320.5	5/25/2004	soil	EPA6010	REG	7440-39-3	Barium	3.1	mg/kg	B	10
383MH1320.5	5/25/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.15	mg/kg	B	0.5
383MH1320.5	5/25/2004	soil	EPA6010	REG	7440-47-3	Chromium	1.3	mg/kg		1
383MH1320.5	5/25/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.017	mg/kg	B	0.1
383MH1320.5	5/25/2004	soil	EPA6010	REG	7440-22-4	Silver	0.19	mg/kg	B	1
383MH1407.5	5/20/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.84	pCi/g	G	0.45
383MH1407.5	5/20/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3	mg/kg		1.1
383MH1407.5	5/20/2004	soil	EPA6010	REG	7440-39-3	Barium	220	mg/kg		11
383MH1407.5	5/20/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.1	mg/kg		0.56
383MH1407.5	5/20/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.02	pCi/g	G,J	0.28
383MH1407.5	5/20/2004	soil	EPA6010	REG	7440-47-3	Chromium	0.99	mg/kg	B	1.1
383MH1407.5	5/20/2004	soil	HASL300	REG	10045-97-3	Cs-137	10.7	pCi/g	G	0.1
383MH1407.5	5/20/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	3.5	mg/kg	J	5.6
383MH1407.5	5/20/2004	soil	HASL300	REG	13966-00-2	K-40	30.6	pCi/g	G	1.5
383MH1407.5	5/20/2004	soil	EPA6010	REG	7439-92-1	Lead	12	mg/kg		0.34
383MH1407.5	5/20/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.068	mg/kg	B	0.11
383MH1407.5	5/20/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	1.1	µg/kg	J,B	5.6
383MH1407.5	5/20/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.35	pCi/g	J	0.25
383MH1407.5	5/20/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.02	pCi/g	G,J	0.3
383MH1407.5	5/20/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.141	pCi/g		0.018
383MH1407.5	5/20/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	1.86	pCi/g	J	0.01
383MH1407.5	5/20/2004	soil	SR7500	REG	10098-97-2	Sr-90	0.67	pCi/g		0.26
383MH1407.5	5/20/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.61	pCi/g	G	0.14
383MH1422.0	5/20/2004	soil	EPA8260	REG	67-64-1	Acetone	18	µg/kg	J	20
383MH1422.0	5/20/2004	soil	EPA6010	REG	7440-38-2	Arsenic	1.1	mg/kg		1
383MH1422.0	5/20/2004	soil	EPA6010	REG	7440-39-3	Barium	14	mg/kg		10
383MH1422.0	5/20/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.23	mg/kg	B	0.51
383MH1422.0	5/20/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.02	mg/kg	B	0.51
383MH1422.0	5/20/2004	soil	EPA6010	REG	7440-47-3	Chromium	1.7	mg/kg		1

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383MH1422.0	5/20/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.023	mg/kg	B	0.1
383MH1422.0	5/20/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	0.91	µg/kg	J,B	5.1
383MH1422.0	5/20/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.29	pCi/g	J	0.14
383MH1422.0	5/20/2004	soil	EPA6010	REG	7440-22-4	Silver	0.11	mg/kg	B	1
383MH1501.0	5/24/2004	soil	HASL300	REG	14331-83-0	Ac-228	2.02	pCi/g	G	0.8
383MH1501.0	5/24/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3.6	mg/kg		1.1
383MH1501.0	5/24/2004	soil	EPA6010	REG	7440-39-3	Barium	520	mg/kg		11
383MH1501.0	5/24/2004	soil	EPA8270	REG	56-55-3	Benzo(A)Anthracene	19	µg/kg	J	380
383MH1501.0	5/24/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.78	mg/kg		0.57
383MH1501.0	5/24/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.29	pCi/g	G,J	0.34
383MH1501.0	5/24/2004	soil	EPA6010	REG	7440-47-3	Chromium	4.9	mg/kg		1.1
383MH1501.0	5/24/2004	soil	HASL300	REG	10045-97-3	Cs-137	0.55	pCi/g	G	0.18
383MH1501.0	5/24/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	52	mg/kg	M,H	5.7
383MH1501.0	5/24/2004	soil	HASL300	REG	13966-00-2	K-40	31.3	pCi/g	G	2.1
383MH1501.0	5/24/2004	soil	EPA6010	REG	7439-92-1	Lead	27	mg/kg		0.34
383MH1501.0	5/24/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.015	mg/kg	B	0.11
383MH1501.0	5/24/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	1.7	µg/kg	J,B	5.7
383MH1501.0	5/24/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.13	pCi/g	J	0.24
383MH1501.0	5/24/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.17	pCi/g	G,J	0.31
383MH1501.0	5/24/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.69	pCi/g	G	0.16
383MH1503.5	5/24/2004	soil	EPA8260	REG	67-64-1	Acetone	8.2	µg/kg	J	20
383MH1503.5	5/24/2004	soil	EPA6010	REG	7440-38-2	Arsenic	0.46	mg/kg	B	1
383MH1503.5	5/24/2004	soil	EPA6010	REG	7440-39-3	Barium	3.2	mg/kg	B	10
383MH1503.5	5/24/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.16	mg/kg	B	0.51
383MH1503.5	5/24/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.41	pCi/g	J	0.16
383MH1503.5	5/24/2004	soil	EPA6010	REG	7440-47-3	Chromium	0.91	mg/kg	B	1
383MH1503.5	5/24/2004	soil	EPA8260	REG	87-68-3	Hexachlorobutadiene	1.5	µg/kg	J	5.1
383MH1503.5	5/24/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.11	mg/kg		0.1
383MH1503.5	5/24/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	1.6	µg/kg	J,B	5.1
383MH1503.5	5/24/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.46	pCi/g	J	0.14
383MH1503.5	5/24/2004	soil	EPA6010	REG	7782-49-2	Selenium	0.29	mg/kg	B	0.51
383MH1503.5X	5/24/2004	soil	EPA8260	FD	67-64-1	Acetone	8.3	µg/kg	J	20
383MH1503.5X	5/24/2004	soil	EPA6010	FD	7440-38-2	Arsenic	0.59	mg/kg	B	1
383MH1503.5X	5/24/2004	soil	EPA6010	FD	7440-39-3	Barium	3.1	mg/kg	B	10
383MH1503.5X	5/24/2004	soil	EPA6010	FD	7440-41-7	Beryllium	0.16	mg/kg	B	0.51

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383MH1503.5X	5/24/2004	soil	HASL300	FD	14733-03-0	Bi-214	0.43	pCi/g	J	0.13
383MH1503.5X	5/24/2004	soil	EPA6010	FD	7440-47-3	Chromium	0.92	mg/kg	B	1
383MH1503.5X	5/24/2004	soil	EPA7470	FD	7439-97-6	Mercury	0.13	mg/kg		0.1
383MH1503.5X	5/24/2004	soil	EPA8260	FD	75-09-2	Methylene Chloride	1.6	µg/kg	J,B	5.1
383MH1503.5X	5/24/2004	soil	HASL300	FD	15067-28-4	Pb-214	0.47	pCi/g	J	0.11
383MH1503.5X	5/24/2004	soil	EPA6010	FD	7440-22-4	Silver	0.099	mg/kg	B	1
383MH1503.5X	5/24/2004	soil	EPA8260	FD	100-42-5	Styrene	0.89	µg/kg	J	5.1
383MH1608.5	6/11/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.45	pCi/g	G	0.59
383MH1608.5	6/11/2004	soil	EPA8260	REG	67-64-1	Acetone	7.5	µg/kg	J	22
383MH1608.5	6/11/2004	soil	HASL300	REG	14596-10-2	Am-241	0.52	pCi/g	G	0.3
383MH1608.5	6/11/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3.6	mg/kg		1.1
383MH1608.5	6/11/2004	soil	EPA6010	REG	7440-39-3	Barium	64	mg/kg		11
383MH1608.5	6/11/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.8	mg/kg		0.55
383MH1608.5	6/11/2004	soil	HASL300	REG	14913-49-6	Bi-212	2.2	pCi/g	G	2
383MH1608.5	6/11/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.8	pCi/g	G,J	0.28
383MH1608.5	6/11/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.091	mg/kg	B	0.55
383MH1608.5	6/11/2004	soil	EPA6010	REG	7440-47-3	Chromium	2	mg/kg		1.1
383MH1608.5	6/11/2004	soil	HASL300	REG	10045-97-3	Cs-137	2.67	pCi/g	G	0.12
383MH1608.5	6/11/2004	soil	HASL300	REG	13966-00-2	K-40	19.2	pCi/g	G	1.5
383MH1608.5	6/11/2004	soil	EPA6010	REG	7439-92-1	Lead	15	mg/kg		1.6
383MH1608.5	6/11/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.089	mg/kg	B	0.11
383MH1608.5	6/11/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.44	pCi/g	G	0.22
383MH1608.5	6/11/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.92	pCi/g	G,J	0.27
383MH1608.5	6/11/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.05	pCi/g		0.009
383MH1608.5	6/11/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	2.82	pCi/g		0.02
383MH1608.5	6/11/2004	soil	SR7500	REG	10098-97-2	Sr-90	0.21	pCi/g	LT	0.18
383MH1608.5	6/11/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.46	pCi/g	G	0.15
383MH1609.5	6/11/2004	soil	HASL300	REG	14331-83-0	Ac-228	2.13	pCi/g	G	0.56
383MH1609.5	6/11/2004	soil	EPA6010	REG	7440-38-2	Arsenic	2.7	mg/kg		1.1
383MH1609.5	6/11/2004	soil	EPA6010	REG	7440-39-3	Barium	58	mg/kg		11
383MH1609.5	6/11/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.68	mg/kg		0.56
383MH1609.5	6/11/2004	soil	HASL300	REG	14913-49-6	Bi-212	3.7	pCi/g	G	2.6
383MH1609.5	6/11/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.02	pCi/g	G,J	0.4
383MH1609.5	6/11/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.041	mg/kg	B	0.56
383MH1609.5	6/11/2004	soil	EPA6010	REG	7440-47-3	Chromium	0.88	mg/kg	B	1.1

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383MH1609.5	6/11/2004	soil	HASL300	REG	10045-97-3	Cs-137	34.5	pCi/g	G	0.2
383MH1609.5	6/11/2004	soil	HASL300	REG	13966-00-2	K-40	34	pCi/g	G	1.3
383MH1609.5	6/11/2004	soil	EPA6010	REG	7439-92-1	Lead	9.5	mg/kg		0.34
383MH1609.5	6/11/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.012	mg/kg	B	0.11
383MH1609.5	6/11/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.26	pCi/g	G	0.4
383MH1609.5	6/11/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.96	pCi/g	G,J	0.6
383MH1609.5	6/11/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.093	pCi/g		0.018
383MH1609.5	6/11/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.5	pCi/g		0.01
383MH1609.5	6/11/2004	soil	SR7500	REG	10098-97-2	Sr-90	4.2	pCi/g	Y1	0.2
383MH1609.5	6/11/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.82	pCi/g	G	0.2
383MH1619.0	6/11/2004	soil	EPA8260	REG	67-64-1	Acetone	7.7	µg/kg	J	20
383MH1619.0	6/11/2004	soil	EPA6010	REG	7440-38-2	Arsenic	1.6	mg/kg		1
383MH1619.0	6/11/2004	soil	EPA6010	REG	7440-39-3	Barium	16	mg/kg		10
383MH1619.0	6/11/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.27	mg/kg	B	0.51
383MH1619.0	6/11/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.35	pCi/g	J	0.17
383MH1619.0	6/11/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.085	mg/kg	B	0.51
383MH1619.0	6/11/2004	soil	EPA6010	REG	7440-47-3	Chromium	2.4	mg/kg		1
383MH1619.0	6/11/2004	soil	HASL300	REG	10045-97-3	Cs-137	0.163	pCi/g	LT	0.067
383MH1619.0	6/11/2004	soil	HASL300	REG	13966-00-2	K-40	2.05	pCi/g		0.86
383MH1619.0	6/11/2004	soil	EPA6010	REG	7439-92-1	Lead	2.7	mg/kg		1.5
383MH1619.0	6/11/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.057	mg/kg	B	0.1
383MH1619.0	6/11/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.322	pCi/g	J	0.134
383MH1619.0	6/11/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.068	pCi/g		0.009
383MH1619.0	6/11/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.338	pCi/g		0.009
383MH1619.0	6/11/2004	soil	EPA6010	REG	7440-22-4	Silver	0.1	mg/kg	B	1
383MH1716.5	5/22/2004	soil	HASL300	REG	14331-83-0	Ac-228	2.24	pCi/g	G	0.62
383MH1716.5	5/22/2004	soil	EPA6010	REG	7440-38-2	Arsenic	2.9	mg/kg		1.1
383MH1716.5	5/22/2004	soil	EPA6010	REG	7440-39-3	Barium	86	mg/kg		11
383MH1716.5	5/22/2004	soil	EPA8270	REG	56-55-3	Benzo(A)Anthracene	21	µg/kg	J	380
383MH1716.5	5/22/2004	soil	EPA8270	REG	205-99-2	Benzo(B)Fluoranthene	18	µg/kg	J	380
383MH1716.5	5/22/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.3	mg/kg		0.57
383MH1716.5	5/22/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.49	pCi/g	G,J	0.33
383MH1716.5	5/22/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.031	mg/kg	B	0.57
383MH1716.5	5/22/2004	soil	EPA6010	REG	7440-47-3	Chromium	0.65	mg/kg	B	1.1
383MH1716.5	5/22/2004	soil	EPA8270	REG	218-01-9	Chrysene	21	µg/kg	J	380

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383MH1716.5	5/22/2004	soil	HASL300	REG	10045-97-3	Cs-137	6.32	pCi/g	G	0.15
383MH1716.5	5/22/2004	soil	EPA8270	REG	206-44-0	Fluoranthene	22	µg/kg	J	380
383MH1716.5	5/22/2004	soil	HASL300	REG	13966-00-2	K-40	37.2	pCi/g	G	1.4
383MH1716.5	5/22/2004	soil	EPA6010	REG	7439-92-1	Lead	13	mg/kg		0.34
383MH1716.5	5/22/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.0029	mg/kg	B	0.11
383MH1716.5	5/22/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	0.9	µg/kg	J,B	5.7
383MH1716.5	5/22/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.96	pCi/g	J	0.29
383MH1716.5	5/22/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.43	pCi/g	G,J	0.31
383MH1716.5	5/22/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.71	pCi/g	G	0.16
383MH1734.5	5/22/2004	soil	EPA8260	REG	67-64-1	Acetone	6.1	µg/kg	J	21
383MH1734.5	5/22/2004	soil	EPA6010	REG	7440-38-2	Arsenic	1.8	mg/kg		1
383MH1734.5	5/22/2004	soil	EPA6010	REG	7440-39-3	Barium	26	mg/kg		10
383MH1734.5	5/22/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.38	mg/kg	B	0.52
383MH1734.5	5/22/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.94	mg/kg		0.52
383MH1734.5	5/22/2004	soil	EPA6010	REG	7440-47-3	Chromium	3.5	mg/kg		1
383MH1734.5	5/22/2004	soil	EPA6010	REG	7439-92-1	Lead	160	mg/kg		1.6
383MH1734.5	5/22/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.33	mg/kg		0.1
383MH1734.5	5/22/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	0.9	µg/kg	J,B	5.2
383MH1734.5	5/22/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.3	pCi/g	G,J	0.15
383MH1734.5	5/22/2004	soil	EPA6010	REG	7440-22-4	Silver	2.8	mg/kg		1
383MH1803.5	5/23/2004	soil	HASL300	REG	14331-83-0	Ac-228	0.92	pCi/g	G	0.51
383MH1803.5	5/23/2004	soil	EPA6010	REG	7440-38-2	Arsenic	2.2	mg/kg		1.1
383MH1803.5	5/23/2004	soil	EPA6010	REG	7440-39-3	Barium	75	mg/kg		11
383MH1803.5	5/23/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.69	mg/kg		0.56
383MH1803.5	5/23/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.8	pCi/g	G,J	0.28
383MH1803.5	5/23/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.27	mg/kg	B	0.56
383MH1803.5	5/23/2004	soil	EPA6010	REG	7440-47-3	Chromium	2	mg/kg		1.1
383MH1803.5	5/23/2004	soil	HASL300	REG	10045-97-3	Cs-137	5.14	pCi/g	G	0.14
383MH1803.5	5/23/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	5.1	mg/kg	J	5.6
383MH1803.5	5/23/2004	soil	HASL300	REG	13966-00-2	K-40	16.5	pCi/g	G	1
383MH1803.5	5/23/2004	soil	EPA6010	REG	7439-92-1	Lead	25	mg/kg		1.7
383MH1803.5	5/23/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.15	mg/kg		0.11
383MH1803.5	5/23/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	1.1	µg/kg	J,B	5.6
383MH1803.5	5/23/2004	soil	HASL300	REG	15092-94-1	Pb-212	0.99	pCi/g	J	0.22
383MH1803.5	5/23/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.65	pCi/g	G,J	0.32

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383MH1803.5	5/23/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.112	pCi/g	J	0.017
383MH1803.5	5/23/2004	soil	EPA6010	REG	7440-22-4	Silver	0.1	mg/kg	B	1.1
383MH1803.5	5/23/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.32	pCi/g	G	0.12
383MH1811.5	5/23/2004	soil	EPA8260	REG	67-64-1	Acetone	8.9	µg/kg	J	21
383MH1811.5	5/23/2004	soil	EPA6010	REG	7440-38-2	Arsenic	1.6	mg/kg		1
383MH1811.5	5/23/2004	soil	EPA6010	REG	7440-39-3	Barium	34	mg/kg		10
383MH1811.5	5/23/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.38	mg/kg	B	0.52
383MH1811.5	5/23/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.53	pCi/g	J	0.14
383MH1811.5	5/23/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.019	mg/kg	B	0.52
383MH1811.5	5/23/2004	soil	EPA6010	REG	7440-47-3	Chromium	3.5	mg/kg		1
383MH1811.5	5/23/2004	soil	HASL300	REG	13966-00-2	K-40	3.8	pCi/g		0.8
383MH1811.5	5/23/2004	soil	EPA6010	REG	7439-92-1	Lead	5.4	mg/kg		1.5
383MH1811.5	5/23/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.13	mg/kg		0.1
383MH1811.5	5/23/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	0.83	µg/kg	J,B	5.2
383MH1811.5	5/23/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.6	pCi/g	J	0.14
383MH1811.5	5/23/2004	soil	EPA6010	REG	7440-22-4	Silver	0.17	mg/kg	B	1
383MH1811.5	5/23/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.125	pCi/g		0.066
383MH2A08.0	6/8/2004	soil	HASL300	REG	14331-83-0	Ac-228	2.16	pCi/g	G	0.81
383MH2A08.0	6/8/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3.4	mg/kg		1.2
383MH2A08.0	6/8/2004	soil	EPA6010	REG	7440-39-3	Barium	140	mg/kg		12
383MH2A08.0	6/8/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.1	mg/kg		0.61
383MH2A08.0	6/8/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.23	pCi/g	G,J	0.4
383MH2A08.0	6/8/2004	soil	EPA8270	REG	117-81-7	Bis(2-Ethylhexyl)Phthalate	170	µg/kg	J	410
383MH2A08.0	6/8/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.09	mg/kg	B	0.61
383MH2A08.0	6/8/2004	soil	EPA6010	REG	7440-47-3	Chromium	1.2	mg/kg	B	1.2
383MH2A08.0	6/8/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	3.4	mg/kg	J	6.1
383MH2A08.0	6/8/2004	soil	HASL300	REG	13966-00-2	K-40	36.7	pCi/g	G	2
383MH2A08.0	6/8/2004	soil	EPA6010	REG	7439-92-1	Lead	15	mg/kg		0.37
383MH2A08.0	6/8/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.0021	mg/kg	B	0.12
383MH2A08.0	6/8/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.52	pCi/g	J	0.27
383MH2A08.0	6/8/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.36	pCi/g	G,J	0.33
383MH2A08.0	6/8/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.66	pCi/g	G	0.18
383MH2A37.5	6/8/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.5	pCi/g	G	0.66
383MH2A37.5	6/8/2004	soil	HASL300	REG	14596-10-2	Am-241	23.5	pCi/g	J	2.3
383MH2A37.5	6/8/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3.5	mg/kg		1.1

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383MH2A37.5	6/8/2004	soil	EPA6010	REG	7440-39-3	Barium	80	mg/kg		11
383MH2A37.5	6/8/2004	soil	EPA8270	REG	56-55-3	Benzo(A)Anthracene	85	µg/kg	J	370
383MH2A37.5	6/8/2004	soil	EPA8270	REG	50-32-8	Benzo(A)Pyrene	60	µg/kg	J	370
383MH2A37.5	6/8/2004	soil	EPA8270	REG	205-99-2	Benzo(B)Fluoranthene	140	µg/kg	J	370
383MH2A37.5	6/8/2004	soil	EPA8270	REG	207-08-9	Benzo(K)Fluoranthene	34	µg/kg	J	370
383MH2A37.5	6/8/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.88	mg/kg		0.56
383MH2A37.5	6/8/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.26	mg/kg	B	0.56
383MH2A37.5	6/8/2004	soil	EPA6010	REG	7440-47-3	Chromium	3.5	mg/kg		1.1
383MH2A37.5	6/8/2004	soil	EPA8270	REG	218-01-9	Chrysene	130	µg/kg	J	370
383MH2A37.5	6/8/2004	soil	HASL300	REG	10045-97-3	Cs-137	218	pCi/g	G	0
383MH2A37.5	6/8/2004	soil	EPA8270	REG	206-44-0	Fluoranthene	91	µg/kg	J	370
383MH2A37.5	6/8/2004	soil	EPA8270	REG	193-39-5	Indeno(1,2,3-Cd)Pyrene	27	µg/kg	J	370
383MH2A37.5	6/8/2004	soil	HASL300	REG	13966-00-2	K-40	23.1	pCi/g	G	1.3
383MH2A37.5	6/8/2004	soil	EPA6010	REG	7439-92-1	Lead	25	mg/kg		1.7
383MH2A37.5	6/8/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.1	mg/kg	B	0.11
383MH2A37.5	6/8/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.78	pCi/g	J	0.68
383MH2A37.5	6/8/2004	soil	EPA8270	REG	85-01-8	Phenanthrene	34	µg/kg	J	370
383MH2A37.5	6/8/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	3.62	pCi/g	Y1	0.01
383MH2A37.5	6/8/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	80	pCi/g	J	0
383MH2A37.5	6/8/2004	soil	EPA8270	REG	129-00-0	Pyrene	93	µg/kg	J	370
383MH2A37.5	6/8/2004	soil	EPA6010	REG	7440-22-4	Silver	1.1	mg/kg	B	1.1
383MH2A37.5	6/8/2004	soil	SR7500	REG	10098-97-2	Sr-90	10.9	pCi/g		0.2
383MH2A45.0	6/8/2004	soil	EPA8260	REG	67-64-1	Acetone	15	µg/kg	J	21
383MH2A45.0	6/8/2004	soil	HASL300	REG	14596-10-2	Am-241	1.1	pCi/g		0.25
383MH2A45.0	6/8/2004	soil	EPA6010	REG	7440-38-2	Arsenic	1.4	mg/kg		1
383MH2A45.0	6/8/2004	soil	EPA6010	REG	7440-39-3	Barium	40	mg/kg		10
383MH2A45.0	6/8/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.53	mg/kg		0.52
383MH2A45.0	6/8/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.62	pCi/g	J	0.25
383MH2A45.0	6/8/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.16	mg/kg	B	0.52
383MH2A45.0	6/8/2004	soil	EPA6010	REG	7440-47-3	Chromium	4.3	mg/kg		1
383MH2A45.0	6/8/2004	soil	HASL300	REG	10045-97-3	Cs-137	9.8	pCi/g		0.1
383MH2A45.0	6/8/2004	soil	HASL300	REG	13966-00-2	K-40	10.8	pCi/g		0.9
383MH2A45.0	6/8/2004	soil	EPA6010	REG	7439-92-1	Lead	9.5	mg/kg		1.6
383MH2A45.0	6/8/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.043	mg/kg	B	0.1
383MH2A45.0	6/8/2004	soil	HASL300	REG	15092-94-1	Pb-212	0.72	pCi/g	J	0.21

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383MH2A45.0	6/8/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.45	pCi/g	J	0.24
383MH2A45.0	6/8/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.213	pCi/g		0.025
383MH2A45.0	6/8/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	4.55	pCi/g	J	0.02
383MH2A45.0	6/8/2004	soil	EPA6010	REG	7440-22-4	Silver	0.45	mg/kg	B	1
383MH2A45.0	6/8/2004	soil	HASL300	REG	14913-50-9	TI-208	0.213	pCi/g		0.116
383OB0100.5	6/1/2004	soil	EPA8260	REG	78-93-3	2-Butanone	17	µg/kg	J	21
383OB0100.5	6/1/2004	soil	HASL300	REG	14331-83-0	Ac-228	2.21	pCi/g	G	0.61
383OB0100.5	6/1/2004	soil	EPA8260	REG	67-64-1	Acetone	72	µg/kg		21
383OB0100.5	6/1/2004	soil	EPA6010	REG	7440-38-2	Arsenic	2.9	mg/kg		1
383OB0100.5	6/1/2004	soil	EPA6010	REG	7440-39-3	Barium	180	mg/kg		10
383OB0100.5	6/1/2004	soil	EPA8270	REG	56-55-3	Benzo(A)Anthracene	260	µg/kg	J	1700
383OB0100.5	6/1/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.64	mg/kg		0.51
383OB0100.5	6/1/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.58	pCi/g	G,J	0.29
383OB0100.5	6/1/2004	soil	EPA6010	REG	7440-43-9	Cadmium	1.4	mg/kg		0.51
383OB0100.5	6/1/2004	soil	EPA6010	REG	7440-47-3	Chromium	6.2	mg/kg		1
383OB0100.5	6/1/2004	soil	EPA8270	REG	218-01-9	Chrysene	590	µg/kg	J	1700
383OB0100.5	6/1/2004	soil	HASL300	REG	10045-97-3	Cs-137	1.34	pCi/g	G	0.18
383OB0100.5	6/1/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	3400	mg/kg	M,H	26
383OB0100.5	6/1/2004	soil	EPA8270	REG	206-44-0	Fluoranthene	170	µg/kg	J	1700
383OB0100.5	6/1/2004	soil	HASL300	REG	13966-00-2	K-40	21.7	pCi/g	G	1.6
383OB0100.5	6/1/2004	soil	EPA6010	REG	7439-92-1	Lead	30	mg/kg		0.31
383OB0100.5	6/1/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.25	pCi/g	J	0.34
383OB0100.5	6/1/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.86	pCi/g	G,J	0.31
383OB0100.5	6/1/2004	soil	EPA8270	REG	85-01-8	Phenanthrene	220	µg/kg	J	1700
383OB0100.5	6/1/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.213	pCi/g	J	0.017
383OB0100.5	6/1/2004	soil	EPA8270	REG	129-00-0	Pyrene	2100	µg/kg	J	1700
383OB0100.5	6/1/2004	soil	HASL300	REG	14913-50-9	TI-208	0.68	pCi/g	G	0.16
383OB0100.5RR1	6/1/2004	soil	EPA8270	RE	56-55-3	Benzo(A)Anthracene	340	µg/kg	J	3400
383OB0100.5RR1	6/1/2004	soil	EPA8270	RE	218-01-9	Chrysene	570	µg/kg	J	3400
383OB0100.5RR1	6/1/2004	soil	EPA8270	RE	206-44-0	Fluoranthene	220	µg/kg	J	3400
383OB0100.5RR1	6/1/2004	soil	EPA8270	RE	129-00-0	Pyrene	1400	µg/kg	J	3400
383OB0200.5	6/1/2004	soil	EPA8260	REG	78-93-3	2-Butanone	11	µg/kg	J	21
383OB0200.5	6/1/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.99	pCi/g	G	0.58
383OB0200.5	6/1/2004	soil	EPA8260	REG	67-64-1	Acetone	61	µg/kg		21
383OB0200.5	6/1/2004	soil	EPA8270	REG	120-12-7	Anthracene	86	µg/kg	J	1700

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383OB0200.5	6/1/2004	soil	EPA6010	REG	7440-38-2	Arsenic	4.9	mg/kg		1
383OB0200.5	6/1/2004	soil	EPA6010	REG	7440-39-3	Barium	260	mg/kg		10
383OB0200.5	6/1/2004	soil	EPA8270	REG	56-55-3	Benzo(A)Anthracene	1400	µg/kg	J	1700
383OB0200.5	6/1/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.77	mg/kg		0.51
383OB0200.5	6/1/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.79	pCi/g	G,J	0.33
383OB0200.5	6/1/2004	soil	EPA6010	REG	7440-43-9	Cadmium	1.4	mg/kg		0.51
383OB0200.5	6/1/2004	soil	EPA8270	REG	86-74-8	Carbazole	160	µg/kg	J	1700
383OB0200.5	6/1/2004	soil	EPA6010	REG	7440-47-3	Chromium	6.7	mg/kg		1
383OB0200.5	6/1/2004	soil	EPA8270	REG	218-01-9	Chrysene	2500	µg/kg	J	1700
383OB0200.5	6/1/2004	soil	HASL300	REG	10045-97-3	Cs-137	4.1	pCi/g	G	0.17
383OB0200.5	6/1/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	2500	mg/kg	M,H	26
383OB0200.5	6/1/2004	soil	EPA8270	REG	206-44-0	Fluoranthene	1000	µg/kg	J	1700
383OB0200.5	6/1/2004	soil	HASL300	REG	13966-00-2	K-40	24.2	pCi/g	G	1.9
383OB0200.5	6/1/2004	soil	EPA6010	REG	7439-92-1	Lead	30	mg/kg		0.31
383OB0200.5	6/1/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.13	pCi/g	J	0.37
383OB0200.5	6/1/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.88	pCi/g	G,J	0.39
383OB0200.5	6/1/2004	soil	EPA8270	REG	85-01-8	Phenanthrene	1000	µg/kg	J	1700
383OB0200.5	6/1/2004	soil	EPA8270	REG	129-00-0	Pyrene	25000	µg/kg	J	1700
383OB0200.5	6/1/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.88	pCi/g	G	0.16
383OB0200.5RR1	6/1/2004	soil	EPA8270	RE	56-55-3	Benzo(A)Anthracene	1400	µg/kg	J	3400
383OB0200.5RR1	6/1/2004	soil	EPA8270	RE	205-99-2	Benzo(B)Fluoranthene	2800	µg/kg	J	3400
383OB0200.5RR1	6/1/2004	soil	EPA8270	RE	207-08-9	Benzo(K)Fluoranthene	1800	µg/kg	J	3400
383OB0200.5RR1	6/1/2004	soil	EPA8270	RE	218-01-9	Chrysene	2400	µg/kg	J	3400
383OB0200.5RR1	6/1/2004	soil	EPA8270	RE	206-44-0	Fluoranthene	1900	µg/kg	J	3400
383OB0200.5RR1	6/1/2004	soil	EPA8270	RE	85-01-8	Phenanthrene	1100	µg/kg	J	3400
383OB0200.5RR1	6/1/2004	soil	EPA8270	RE	129-00-0	Pyrene	6400	µg/kg	J	3400
383OB0300.5	6/1/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.96	pCi/g	G	0.57
383OB0300.5	6/1/2004	soil	EPA8260	REG	67-64-1	Acetone	7.2	µg/kg	J,B	21
383OB0300.5	6/1/2004	soil	EPA6010	REG	7440-38-2	Arsenic	4.1	mg/kg		1.1
383OB0300.5	6/1/2004	soil	EPA6010	REG	7440-39-3	Barium	180	mg/kg		11
383OB0300.5	6/1/2004	soil	EPA8270	REG	56-55-3	Benzo(A)Anthracene	120	µg/kg	J	350
383OB0300.5	6/1/2004	soil	EPA8270	REG	50-32-8	Benzo(A)Pyrene	230	µg/kg	J	350
383OB0300.5	6/1/2004	soil	EPA8270	REG	205-99-2	Benzo(B)Fluoranthene	510	µg/kg	J	350
383OB0300.5	6/1/2004	soil	EPA8270	REG	191-24-2	Benzo(G,H,I)Perylene	120	µg/kg	J	350
383OB0300.5	6/1/2004	soil	EPA8270	REG	207-08-9	Benzo(K)Fluoranthene	220	µg/kg	J	350

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383OB0300.5	6/1/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.1	mg/kg		0.53
383OB0300.5	6/1/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.01	pCi/g	G,J	0.29
383OB0300.5	6/1/2004	soil	EPA6010	REG	7440-47-3	Chromium	3.9	mg/kg		1.1
383OB0300.5	6/1/2004	soil	EPA8270	REG	218-01-9	Chrysene	340	µg/kg	J	350
383OB0300.5	6/1/2004	soil	HASL300	REG	10045-97-3	Cs-137	6.13	pCi/g	G	0.13
383OB0300.5	6/1/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	330	mg/kg	H,Z	5.3
383OB0300.5	6/1/2004	soil	EPA8270	REG	206-44-0	Fluoranthene	210	µg/kg	J	350
383OB0300.5	6/1/2004	soil	HASL300	REG	13966-00-2	K-40	22	pCi/g	G	1.5
383OB0300.5	6/1/2004	soil	EPA6010	REG	7439-92-1	Lead	20	mg/kg		0.32
383OB0300.5	6/1/2004	soil	EPA8270	REG	91-20-3	Naphthalene	54	µg/kg	J	350
383OB0300.5	6/1/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.13	pCi/g	J	0.24
383OB0300.5	6/1/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.97	pCi/g	G,J	0.28
383OB0300.5	6/1/2004	soil	EPA8270	REG	85-01-8	Phenanthrene	65	µg/kg	J	350
383OB0300.5	6/1/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.59	pCi/g	J	0.02
383OB0300.5	6/1/2004	soil	EPA8270	REG	129-00-0	Pyrene	620	µg/kg	J	350
383OB0300.5	6/1/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.69	pCi/g	G	0.14
383OB0400.5	6/1/2004	soil	HASL300	REG	14331-83-0	Ac-228	2	pCi/g	G	0.43
383OB0400.5	6/1/2004	soil	EPA6010	REG	7440-38-2	Arsenic	5.1	mg/kg		1
383OB0400.5	6/1/2004	soil	EPA6010	REG	7440-39-3	Barium	300	mg/kg		10
383OB0400.5	6/1/2004	soil	EPA8270	REG	56-55-3	Benzo(A)Anthracene	110	µg/kg	J	350
383OB0400.5	6/1/2004	soil	EPA8270	REG	50-32-8	Benzo(A)Pyrene	160	µg/kg	J	350
383OB0400.5	6/1/2004	soil	EPA8270	REG	205-99-2	Benzo(B)Fluoranthene	310	µg/kg	J	350
383OB0400.5	6/1/2004	soil	EPA8270	REG	191-24-2	Benzo(G,H,I)Perylene	59	µg/kg	J	350
383OB0400.5	6/1/2004	soil	EPA8270	REG	207-08-9	Benzo(K)Fluoranthene	140	µg/kg	J	350
383OB0400.5	6/1/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.82	mg/kg		0.52
383OB0400.5	6/1/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.04	pCi/g	G,J	0.27
383OB0400.5	6/1/2004	soil	EPA6010	REG	7440-47-3	Chromium	5.8	mg/kg		1
383OB0400.5	6/1/2004	soil	EPA8270	REG	218-01-9	Chrysene	230	µg/kg	J	350
383OB0400.5	6/1/2004	soil	HASL300	REG	10045-97-3	Cs-137	5.97	pCi/g	G	0.16
383OB0400.5	6/1/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	63	mg/kg	M,H	5.2
383OB0400.5	6/1/2004	soil	EPA8270	REG	206-44-0	Fluoranthene	190	µg/kg	J	350
383OB0400.5	6/1/2004	soil	EPA8270	REG	193-39-5	Indeno(1,2,3-Cd)Pyrene	54	µg/kg	J	350
383OB0400.5	6/1/2004	soil	HASL300	REG	13966-00-2	K-40	25	pCi/g	G	1.5
383OB0400.5	6/1/2004	soil	EPA6010	REG	7439-92-1	Lead	30	mg/kg		0.31
383OB0400.5	6/1/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.48	pCi/g	J	0.25

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383OB0400.5	6/1/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.91	pCi/g	G,J	0.34
383OB0400.5	6/1/2004	soil	EPA8270	REG	85-01-8	Phenanthrene	55	µg/kg	J	350
383OB0400.5	6/1/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.158	pCi/g	J	0.01
383OB0400.5	6/1/2004	soil	EPA8270	REG	129-00-0	Pyrene	220	µg/kg	J	350
383OB0400.5	6/1/2004	soil	HASL300	REG	14913-50-9	TI-208	0.59	pCi/g	G	0.16
383OB0500.5	6/1/2004	soil	HASL300	REG	14331-83-0	Ac-228	2.2	pCi/g	G	0.66
383OB0500.5	6/1/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3.8	mg/kg		1.1
383OB0500.5	6/1/2004	soil	EPA6010	REG	7440-39-3	Barium	140	mg/kg		11
383OB0500.5	6/1/2004	soil	EPA8270	REG	56-55-3	Benzo(A)Anthracene	200	µg/kg	J	350
383OB0500.5	6/1/2004	soil	EPA8270	REG	50-32-8	Benzo(A)Pyrene	250	µg/kg	J	350
383OB0500.5	6/1/2004	soil	EPA8270	REG	205-99-2	Benzo(B)Fluoranthene	670	µg/kg	J	350
383OB0500.5	6/1/2004	soil	EPA8270	REG	207-08-9	Benzo(K)Fluoranthene	280	µg/kg	J	350
383OB0500.5	6/1/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.2	mg/kg		0.53
383OB0500.5	6/1/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.01	pCi/g	G,J	0.34
383OB0500.5	6/1/2004	soil	EPA6010	REG	7440-47-3	Chromium	2.5	mg/kg		1.1
383OB0500.5	6/1/2004	soil	EPA8270	REG	218-01-9	Chrysene	410	µg/kg		350
383OB0500.5	6/1/2004	soil	HASL300	REG	10045-97-3	Cs-137	5.65	pCi/g	G	0.24
383OB0500.5	6/1/2004	soil	EPA8270	REG	206-44-0	Fluoranthene	400	µg/kg		350
383OB0500.5	6/1/2004	soil	HASL300	REG	13966-00-2	K-40	24.6	pCi/g	G	1.9
383OB0500.5	6/1/2004	soil	EPA6010	REG	7439-92-1	Lead	17	mg/kg		0.32
383OB0500.5	6/1/2004	soil	EPA8270	REG	91-20-3	Naphthalene	15	µg/kg	J	350
383OB0500.5	6/1/2004	soil	HASL300	REG	15092-94-1	Pb-212	3.1	pCi/g	J	0.34
383OB0500.5	6/1/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.04	pCi/g	G,J	0.4
383OB0500.5	6/1/2004	soil	EPA8270	REG	85-01-8	Phenanthrene	140	µg/kg	J	350
383OB0500.5	6/1/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.089	pCi/g	J	0.025
383OB0500.5	6/1/2004	soil	EPA8270	REG	129-00-0	Pyrene	460	µg/kg		350
383OB0500.5	6/1/2004	soil	HASL300	REG	14913-50-9	TI-208	0.97	pCi/g	G	0.18
383OB0500.5X	6/1/2004	soil	HASL300	FD	14331-83-0	Ac-228	2.41	pCi/g	G	0.57
383OB0500.5X	6/1/2004	soil	EPA6010	FD	7440-38-2	Arsenic	3.5	mg/kg		1.1
383OB0500.5X	6/1/2004	soil	EPA6010	FD	7440-39-3	Barium	130	mg/kg		11
383OB0500.5X	6/1/2004	soil	EPA8270	FD	56-55-3	Benzo(A)Anthracene	200	µg/kg	J	360
383OB0500.5X	6/1/2004	soil	EPA8270	FD	50-32-8	Benzo(A)Pyrene	240	µg/kg	J	360
383OB0500.5X	6/1/2004	soil	EPA8270	FD	205-99-2	Benzo(B)Fluoranthene	550	µg/kg	J	360
383OB0500.5X	6/1/2004	soil	EPA8270	FD	191-24-2	Benzo(G,H,I)Perylene	81	µg/kg	J	360
383OB0500.5X	6/1/2004	soil	EPA8270	FD	207-08-9	Benzo(K)Fluoranthene	260	µg/kg	J	360

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383OB0500.5X	6/1/2004	soil	EPA6010	FD	7440-41-7	Beryllium	1	mg/kg		0.54
383OB0500.5X	6/1/2004	soil	HASL300	FD	14733-03-0	Bi-214	1.07	pCi/g	G,J	0.36
383OB0500.5X	6/1/2004	soil	EPA6010	FD	7440-47-3	Chromium	2.5	mg/kg		1.1
383OB0500.5X	6/1/2004	soil	EPA8270	FD	218-01-9	Chrysene	410	µg/kg		360
383OB0500.5X	6/1/2004	soil	HASL300	FD	10045-97-3	Cs-137	5	pCi/g	G	0.19
383OB0500.5X	6/1/2004	soil	EPA8270	FD	206-44-0	Fluoranthene	400	µg/kg		360
383OB0500.5X	6/1/2004	soil	EPA8270	FD	193-39-5	Indeno(1,2,3-Cd)Pyrene	77	µg/kg	J	360
383OB0500.5X	6/1/2004	soil	HASL300	FD	13966-00-2	K-40	24.1	pCi/g	G	1.9
383OB0500.5X	6/1/2004	soil	EPA6010	FD	7439-92-1	Lead	15	mg/kg		0.32
383OB0500.5X	6/1/2004	soil	HASL300	FD	15092-94-1	Pb-212	2.97	pCi/g	J	0.24
383OB0500.5X	6/1/2004	soil	HASL300	FD	15067-28-4	Pb-214	1.1	pCi/g	G,J	0.34
383OB0500.5X	6/1/2004	soil	EPA8270	FD	85-01-8	Phenanthrene	140	µg/kg	J	360
383OB0500.5X	6/1/2004	soil	UGTAISOPU	FD	15117-48-3	Pu-239	0.157	pCi/g	J	0.023
383OB0500.5X	6/1/2004	soil	EPA8270	FD	129-00-0	Pyrene	510	µg/kg		360
383OB0500.5X	6/1/2004	soil	HASL300	FD	14913-50-9	Tl-208	0.81	pCi/g	G	0.17
383OB0600.5	6/1/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.87	pCi/g	G	0.56
383OB0600.5	6/1/2004	soil	EPA6010	REG	7440-38-2	Arsenic	5.8	mg/kg		1
383OB0600.5	6/1/2004	soil	EPA6010	REG	7440-39-3	Barium	190	mg/kg		10
383OB0600.5	6/1/2004	soil	EPA8270	REG	56-55-3	Benzo(A)Anthracene	45	µg/kg	J	350
383OB0600.5	6/1/2004	soil	EPA8270	REG	50-32-8	Benzo(A)Pyrene	64	µg/kg	J	350
383OB0600.5	6/1/2004	soil	EPA8270	REG	205-99-2	Benzo(B)Fluoranthene	140	µg/kg	J	350
383OB0600.5	6/1/2004	soil	EPA8270	REG	207-08-9	Benzo(K)Fluoranthene	45	µg/kg	J	350
383OB0600.5	6/1/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.77	mg/kg		0.52
383OB0600.5	6/1/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.98	pCi/g	G,J	0.27
383OB0600.5	6/1/2004	soil	EPA6010	REG	7440-47-3	Chromium	8.3	mg/kg		1
383OB0600.5	6/1/2004	soil	EPA8270	REG	218-01-9	Chrysene	110	µg/kg	J	350
383OB0600.5	6/1/2004	soil	HASL300	REG	10045-97-3	Cs-137	0.53	pCi/g	G	0.12
383OB0600.5	6/1/2004	soil	EPA8270	REG	206-44-0	Fluoranthene	93	µg/kg	J	350
383OB0600.5	6/1/2004	soil	HASL300	REG	13966-00-2	K-40	22.7	pCi/g	G	1.5
383OB0600.5	6/1/2004	soil	EPA6010	REG	7439-92-1	Lead	12	mg/kg		0.31
383OB0600.5	6/1/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.12	pCi/g	J	0.2
383OB0600.5	6/1/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.06	pCi/g	G,J	0.24
383OB0600.5	6/1/2004	soil	EPA8270	REG	85-01-8	Phenanthrene	32	µg/kg	J	350
383OB0600.5	6/1/2004	soil	EPA8270	REG	129-00-0	Pyrene	75	µg/kg	J	350
383OB0600.5	6/1/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.59	pCi/g	G	0.13

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383OB0700.5	6/1/2004	soil	HASL300	REG	14331-83-0	Ac-228	2.14	pCi/g	G	0.54
383OB0700.5	6/1/2004	soil	EPA8270	REG	83-32-9	Acenaphthene	39	µg/kg	J	700
383OB0700.5	6/1/2004	soil	EPA8270	REG	120-12-7	Anthracene	150	µg/kg	J	700
383OB0700.5	6/1/2004	soil	EPA6010	REG	7440-38-2	Arsenic	6.7	mg/kg		1
383OB0700.5	6/1/2004	soil	EPA6010	REG	7440-39-3	Barium	250	mg/kg		10
383OB0700.5	6/1/2004	soil	EPA8270	REG	56-55-3	Benzo(A)Anthracene	4300	µg/kg	J	700
383OB0700.5	6/1/2004	soil	EPA8270	REG	50-32-8	Benzo(A)Pyrene	4300	µg/kg	J	700
383OB0700.5	6/1/2004	soil	EPA8270	REG	205-99-2	Benzo(B)Fluoranthene	8200	µg/kg	J	700
383OB0700.5	6/1/2004	soil	EPA8270	REG	191-24-2	Benzo(G,H,I)Perylene	7000	µg/kg	J	700
383OB0700.5	6/1/2004	soil	EPA8270	REG	207-08-9	Benzo(K)Fluoranthene	3200	µg/kg	J	700
383OB0700.5	6/1/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1	mg/kg		0.52
383OB0700.5	6/1/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.92	pCi/g	G,J	0.35
383OB0700.5	6/1/2004	soil	EPA8270	REG	117-81-7	Bis(2-Ethylhexyl)Phthalate	1000	µg/kg	J	700
383OB0700.5	6/1/2004	soil	EPA6010	REG	7440-43-9	Cadmium	1.1	mg/kg		1
383OB0700.5	6/1/2004	soil	EPA8270	REG	86-74-8	Carbazole	290	µg/kg	J	700
383OB0700.5	6/1/2004	soil	EPA6010	REG	7440-47-3	Chromium	10	mg/kg		1
383OB0700.5	6/1/2004	soil	EPA8270	REG	218-01-9	Chrysene	5300	µg/kg	J	700
383OB0700.5	6/1/2004	soil	HASL300	REG	10045-97-3	Cs-137	20.5	pCi/g	G	0.2
383OB0700.5	6/1/2004	soil	EPA8270	REG	53-70-3	Dibenzo(A,H)Anthracene	2100	µg/kg	J	700
383OB0700.5	6/1/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	120	mg/kg	H,Z	5.2
383OB0700.5	6/1/2004	soil	EPA8270	REG	206-44-0	Fluoranthene	3800	µg/kg		700
383OB0700.5	6/1/2004	soil	EPA8270	REG	86-73-7	Fluorene	31	µg/kg	J	700
383OB0700.5	6/1/2004	soil	EPA8270	REG	193-39-5	Indeno(1,2,3-Cd)Pyrene	5000	µg/kg	J	700
383OB0700.5	6/1/2004	soil	HASL300	REG	13966-00-2	K-40	19.8	pCi/g	G	1.2
383OB0700.5	6/1/2004	soil	EPA6010	REG	7439-92-1	Lead	31	mg/kg		0.63
383OB0700.5	6/1/2004	soil	EPA8270	REG	91-20-3	Naphthalene	32	µg/kg	J	700
383OB0700.5	6/1/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.32	pCi/g	J	0.36
383OB0700.5	6/1/2004	soil	EPA8270	REG	85-01-8	Phenanthrene	1200	µg/kg		700
383OB0700.5	6/1/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.051	pCi/g	J	0.018
383OB0700.5	6/1/2004	soil	EPA8270	REG	129-00-0	Pyrene	26000	µg/kg	J	700
383OB0700.5	6/1/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.82	pCi/g	G	0.19
383OB0700.5RR1	6/1/2004	soil	EPA8270	RE	120-12-7	Anthracene	160	µg/kg	J	2100
383OB0700.5RR1	6/1/2004	soil	EPA8270	RE	56-55-3	Benzo(A)Anthracene	4800	µg/kg	J	2100
383OB0700.5RR1	6/1/2004	soil	EPA8270	RE	50-32-8	Benzo(A)Pyrene	4800	µg/kg	J	2100
383OB0700.5RR1	6/1/2004	soil	EPA8270	RE	205-99-2	Benzo(B)Fluoranthene	9600	µg/kg	J	2100

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383OB0700.5RR1	6/1/2004	soil	EPA8270	RE	191-24-2	Benzo(G,H,I)Perylene	2100	µg/kg	J	2100
383OB0700.5RR1	6/1/2004	soil	EPA8270	RE	207-08-9	Benzo(K)Fluoranthene	5500	µg/kg	J	2100
383OB0700.5RR1	6/1/2004	soil	EPA8270	RE	117-81-7	Bis(2-Ethylhexyl)Phthalate	710	µg/kg	J	2100
383OB0700.5RR1	6/1/2004	soil	EPA8270	RE	86-74-8	Carbazole	290	µg/kg	J	2100
383OB0700.5RR1	6/1/2004	soil	EPA8270	RE	218-01-9	Chrysene	5800	µg/kg	J	2100
383OB0700.5RR1	6/1/2004	soil	EPA8270	RE	206-44-0	Fluoranthene	5100	µg/kg		2100
383OB0700.5RR1	6/1/2004	soil	EPA8270	RE	193-39-5	Indeno(1,2,3-Cd)Pyrene	1900	µg/kg	J	2100
383OB0700.5RR1	6/1/2004	soil	EPA8270	RE	85-01-8	Phenanthrene	1300	µg/kg	J	2100
383OB0700.5RR1	6/1/2004	soil	EPA8270	RE	129-00-0	Pyrene	15000	µg/kg	J	2100
383OB0800.5	6/1/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.27	pCi/g	G	0.63
383OB0800.5	6/1/2004	soil	EPA8270	REG	83-32-9	Acenaphthene	93	µg/kg	J	1400
383OB0800.5	6/1/2004	soil	EPA8270	REG	120-12-7	Anthracene	470	µg/kg	J	1400
383OB0800.5	6/1/2004	soil	EPA6010	REG	7440-38-2	Arsenic	7.1	mg/kg		1
383OB0800.5	6/1/2004	soil	EPA6010	REG	7440-39-3	Barium	220	mg/kg		10
383OB0800.5	6/1/2004	soil	EPA8270	REG	56-55-3	Benzo(A)Anthracene	17000	µg/kg	J	1400
383OB0800.5	6/1/2004	soil	EPA8270	REG	50-32-8	Benzo(A)Pyrene	20000	µg/kg	J	1400
383OB0800.5	6/1/2004	soil	EPA8270	REG	205-99-2	Benzo(B)Fluoranthene	37000	µg/kg	J	1400
383OB0800.5	6/1/2004	soil	EPA8270	REG	191-24-2	Benzo(G,H,I)Perylene	32000	µg/kg	J	1400
383OB0800.5	6/1/2004	soil	EPA8270	REG	207-08-9	Benzo(K)Fluoranthene	10000	µg/kg	J	1400
383OB0800.5	6/1/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.77	mg/kg		0.52
383OB0800.5	6/1/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.1	pCi/g	G,J	0.28
383OB0800.5	6/1/2004	soil	EPA8270	REG	117-81-7	Bis(2-Ethylhexyl)Phthalate	4000	µg/kg	J	1400
383OB0800.5	6/1/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.58	mg/kg		0.52
383OB0800.5	6/1/2004	soil	EPA8270	REG	86-74-8	Carbazole	790	µg/kg	J	1400
383OB0800.5	6/1/2004	soil	EPA6010	REG	7440-47-3	Chromium	7.7	mg/kg		1
383OB0800.5	6/1/2004	soil	EPA8270	REG	218-01-9	Chrysene	21000	µg/kg	J	1400
383OB0800.5	6/1/2004	soil	HASL300	REG	10045-97-3	Cs-137	13.6	pCi/g	G	0.2
383OB0800.5	6/1/2004	soil	EPA8270	REG	53-70-3	Dibenzo(A,H)Anthracene	10000	µg/kg	J	1400
383OB0800.5	6/1/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	490	mg/kg	H,Z	5.2
383OB0800.5	6/1/2004	soil	EPA8270	REG	206-44-0	Fluoranthene	10000	µg/kg		1400
383OB0800.5	6/1/2004	soil	EPA8270	REG	86-73-7	Fluorene	68	µg/kg	J	1400
383OB0800.5	6/1/2004	soil	EPA8270	REG	193-39-5	Indeno(1,2,3-Cd)Pyrene	22000	µg/kg	J	1400
383OB0800.5	6/1/2004	soil	HASL300	REG	13966-00-2	K-40	22.4	pCi/g	G	1.8
383OB0800.5	6/1/2004	soil	EPA6010	REG	7439-92-1	Lead	25	mg/kg		0.31
383OB0800.5	6/1/2004	soil	EPA8270	REG	91-20-3	Naphthalene	56	µg/kg	J	1400

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383OB0800.5	6/1/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.83	pCi/g	J	0.34
383OB0800.5	6/1/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.9	pCi/g	G,J	0.41
383OB0800.5	6/1/2004	soil	EPA8270	REG	85-01-8	Phenanthrene	2500	µg/kg		1400
383OB0800.5	6/1/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	1.04	pCi/g	J	0.02
383OB0800.5	6/1/2004	soil	EPA8270	REG	129-00-0	Pyrene	89000	µg/kg	J	1400
383OB0800.5	6/1/2004	soil	EPA6010	REG	7782-49-2	Selenium	1.2	mg/kg		0.52
383OB0800.5	6/1/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.54	pCi/g	G	0.18
383OB0800.5RR1	6/1/2004	soil	EPA8270	RE	56-55-3	Benzo(A)Anthracene	18000	µg/kg	J	6900
383OB0800.5RR1	6/1/2004	soil	EPA8270	RE	50-32-8	Benzo(A)Pyrene	23000	µg/kg	J	6900
383OB0800.5RR1	6/1/2004	soil	EPA8270	RE	205-99-2	Benzo(B)Fluoranthene	43000	µg/kg	J	6900
383OB0800.5RR1	6/1/2004	soil	EPA8270	RE	191-24-2	Benzo(G,H,I)Perylene	16000	µg/kg	J	6900
383OB0800.5RR1	6/1/2004	soil	EPA8270	RE	207-08-9	Benzo(K)Fluoranthene	19000	µg/kg	J	6900
383OB0800.5RR1	6/1/2004	soil	EPA8270	RE	117-81-7	Bis(2-Ethylhexyl)Phthalate	3900	µg/kg	J	6900
383OB0800.5RR1	6/1/2004	soil	EPA8270	RE	218-01-9	Chrysene	23000	µg/kg	J	6900
383OB0800.5RR1	6/1/2004	soil	EPA8270	RE	206-44-0	Fluoranthene	13000	µg/kg	J	6900
383OB0800.5RR1	6/1/2004	soil	EPA8270	RE	193-39-5	Indeno(1,2,3-Cd)Pyrene	12000	µg/kg	J	6900
383OB0800.5RR1	6/1/2004	soil	EPA8270	RE	129-00-0	Pyrene	64000	µg/kg	J	6900
383PB0102.0	6/10/2004	soil	EPA8260	REG	67-64-1	Acetone	11	µg/kg	J	22
383PB0102.0	6/10/2004	soil	EPA6010	REG	7440-38-2	Arsenic	1	mg/kg	B	1.1
383PB0102.0	6/10/2004	soil	EPA6010	REG	7440-39-3	Barium	4900	mg/kg		110
383PB0102.0	6/10/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.19	mg/kg	B	0.54
383PB0102.0	6/10/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.16	mg/kg	B	0.54
383PB0102.0	6/10/2004	soil	EPA6010	REG	7440-47-3	Chromium	4.2	mg/kg		1.1
383PB0102.0	6/10/2004	soil	HASL300	REG	13966-00-2	K-40	17.8	pCi/g	G	1.3
383PB0102.0	6/10/2004	soil	EPA6010	REG	7439-92-1	Lead	5.3	mg/kg		0.33
383PB0102.0	6/10/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.0016	mg/kg	B	0.11
383PB0102.0	6/10/2004	soil	HASL300	REG	15092-94-1	Pb-212	0.27	pCi/g	G	0.15
383PB0102.0	6/10/2004	soil	EPA6010	REG	7440-22-4	Silver	0.077	mg/kg	B	1.1
383PB0104.5	6/10/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.67	pCi/g	G	0.55
383PB0104.5	6/10/2004	soil	EPA8260	REG	67-64-1	Acetone	10	µg/kg	J	21
383PB0104.5	6/10/2004	soil	EPA6010	REG	7440-38-2	Arsenic	2.9	mg/kg		1.1
383PB0104.5	6/10/2004	soil	EPA6010	REG	7440-39-3	Barium	120	mg/kg		11
383PB0104.5	6/10/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.71	mg/kg		0.53
383PB0104.5	6/10/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.96	pCi/g	G,J	0.28
383PB0104.5	6/10/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.17	mg/kg	B	0.53

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383PB0104.5	6/10/2004	soil	EPA6010	REG	7440-47-3	Chromium	2.7	mg/kg		1.1
383PB0104.5	6/10/2004	soil	HASL300	REG	13966-00-2	K-40	26.2	pCi/g	G	1.2
383PB0104.5	6/10/2004	soil	EPA6010	REG	7439-92-1	Lead	5.7	mg/kg		0.64
383PB0104.5	6/10/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.022	mg/kg	B	0.11
383PB0104.5	6/10/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.87	pCi/g	J	0.16
383PB0104.5	6/10/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.08	pCi/g	G,J	0.22
383PB0104.5	6/10/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.59	pCi/g	G	0.11
383PB0200.5	6/17/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.84	pCi/g	G	0.54
383PB0200.5	6/17/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3	mg/kg		1.1
383PB0200.5	6/17/2004	soil	EPA6010	REG	7440-39-3	Barium	5200	mg/kg		550
383PB0200.5	6/17/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.3	mg/kg		0.55
383PB0200.5	6/17/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.58	pCi/g	G,J	0.66
383PB0200.5	6/17/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.16	mg/kg	B	0.55
383PB0200.5	6/17/2004	soil	EPA6010	REG	7440-47-3	Chromium	4.9	mg/kg		1.1
383PB0200.5	6/17/2004	soil	HASL300	REG	10045-97-3	Cs-137	91	pCi/g	G	0
383PB0200.5	6/17/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	5.8	mg/kg	Z,H	5.5
383PB0200.5	6/17/2004	soil	HASL300	REG	13966-00-2	K-40	22	pCi/g	G	1.6
383PB0200.5	6/17/2004	soil	EPA6010	REG	7439-92-1	Lead	21	mg/kg		0.33
383PB0200.5	6/17/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.047	mg/kg	B	0.11
383PB0200.5	6/17/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	0.97	µg/kg	J,B	5.5
383PB0200.5	6/17/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.18	pCi/g	G	0.5
383PB0200.5	6/17/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.5	pCi/g	G,J	0.89
383PB0200.5	6/17/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.271	pCi/g		0.021
383PB0200.5	6/17/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	2.65	pCi/g		0.02
383PB0200.5	6/17/2004	soil	SR7500	REG	10098-97-2	Sr-90	1.38	pCi/g	Y1	0.24
383PB0200.5	6/17/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.57	pCi/g	G	0.3
383PB0300.5	6/17/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.98	pCi/g	G	0.85
383PB0300.5	6/17/2004	soil	HASL300	REG	14596-10-2	Am-241	0.72	pCi/g	G	0.5
383PB0300.5	6/17/2004	soil	EPA6010	REG	7440-38-2	Arsenic	3.6	mg/kg		1.2
383PB0300.5	6/17/2004	soil	EPA6010	REG	7440-39-3	Barium	6300	mg/kg		590
383PB0300.5	6/17/2004	soil	EPA8270	REG	56-55-3	Benzo(A)Anthracene	21	µg/kg	J	390
383PB0300.5	6/17/2004	soil	EPA8270	REG	50-32-8	Benzo(A)Pyrene	18	µg/kg	J	390
383PB0300.5	6/17/2004	soil	EPA8270	REG	205-99-2	Benzo(B)Fluoranthene	31	µg/kg	J	390
383PB0300.5	6/17/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.6	mg/kg		0.59
383PB0300.5	6/17/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.1	pCi/g	G,J	0.72

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383PB0300.5	6/17/2004	soil	EPA8270	REG	117-81-7	Bis(2-Ethylhexyl)Phthalate	85	µg/kg	J	390
383PB0300.5	6/17/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.34	mg/kg	B	0.59
383PB0300.5	6/17/2004	soil	EPA6010	REG	7440-47-3	Chromium	8.7	mg/kg		1.2
383PB0300.5	6/17/2004	soil	EPA8270	REG	218-01-9	Chrysene	30	µg/kg	J	390
383PB0300.5	6/17/2004	soil	HASL300	REG	10045-97-3	Cs-137	56.3	pCi/g	G	0.3
383PB0300.5	6/17/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	17	mg/kg	Z,H	5.9
383PB0300.5	6/17/2004	soil	EPA8270	REG	206-44-0	Fluoranthene	25	µg/kg	J	390
383PB0300.5	6/17/2004	soil	HASL300	REG	13966-00-2	K-40	23.3	pCi/g	G	2.6
383PB0300.5	6/17/2004	soil	EPA6010	REG	7439-92-1	Lead	38	mg/kg		0.71
383PB0300.5	6/17/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.048	mg/kg	B	0.12
383PB0300.5	6/17/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.4	pCi/g	G	0.58
383PB0300.5	6/17/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.11	pCi/g	G,J	0.92
383PB0300.5	6/17/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.348	pCi/g		0.017
383PB0300.5	6/17/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	4.49	pCi/g		0.02
383PB0300.5	6/17/2004	soil	EPA8270	REG	129-00-0	Pyrene	50	µg/kg	J	390
383PB0300.5	6/17/2004	soil	EPA6010	REG	7782-49-2	Selenium	0.53	mg/kg	B	0.59
383PB0300.5	6/17/2004	soil	SR7500	REG	10098-97-2	Sr-90	3.58	pCi/g		0.24
383PB0300.5	6/17/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.63	pCi/g	G	0.38
383PB0300.5X	6/17/2004	soil	HASL300	FD	14331-83-0	Ac-228	1.88	pCi/g	G	0.74
383PB0300.5X	6/17/2004	soil	EPA6010	FD	7440-38-2	Arsenic	3.8	mg/kg		1.2
383PB0300.5X	6/17/2004	soil	EPA6010	FD	7440-39-3	Barium	6500	mg/kg		580
383PB0300.5X	6/17/2004	soil	EPA8270	FD	56-55-3	Benzo(A)Anthracene	21	µg/kg	J	380
383PB0300.5X	6/17/2004	soil	EPA8270	FD	50-32-8	Benzo(A)Pyrene	19	µg/kg	J	380
383PB0300.5X	6/17/2004	soil	EPA8270	FD	205-99-2	Benzo(B)Fluoranthene	26	µg/kg	J	380
383PB0300.5X	6/17/2004	soil	EPA6010	FD	7440-41-7	Beryllium	1.5	mg/kg		0.58
383PB0300.5X	6/17/2004	soil	HASL300	FD	14733-03-0	Bi-214	1.2	pCi/g	G,J	0.59
383PB0300.5X	6/17/2004	soil	EPA8270	FD	117-81-7	Bis(2-Ethylhexyl)Phthalate	90	µg/kg	J	380
383PB0300.5X	6/17/2004	soil	EPA6010	FD	7440-43-9	Cadmium	0.35	mg/kg	B	0.58
383PB0300.5X	6/17/2004	soil	EPA6010	FD	7440-47-3	Chromium	8.5	mg/kg		1.2
383PB0300.5X	6/17/2004	soil	EPA8270	FD	218-01-9	Chrysene	29	µg/kg	J	380
383PB0300.5X	6/17/2004	soil	HASL300	FD	10045-97-3	Cs-137	60.9	pCi/g	G	0.3
383PB0300.5X	6/17/2004	soil	EPA8015	FD	68334-30-5	Diesel-Range Organics	22	mg/kg	Z,H	5.8
383PB0300.5X	6/17/2004	soil	EPA8270	FD	84-66-2	Diethyl Phthalate	89	µg/kg	J	380
383PB0300.5X	6/17/2004	soil	EPA8270	FD	206-44-0	Fluoranthene	23	µg/kg	J	380
383PB0300.5X	6/17/2004	soil	HASL300	FD	13966-00-2	K-40	22.8	pCi/g	G	2.3

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383PB0300.5X	6/17/2004	soil	EPA6010	FD	7439-92-1	Lead	38	mg/kg		0.7
383PB0300.5X	6/17/2004	soil	EPA7470	FD	7439-97-6	Mercury	0.045	mg/kg	B	0.12
383PB0300.5X	6/17/2004	soil	HASL300	FD	15092-94-1	Pb-212	2.03	pCi/g	G	0.53
383PB0300.5X	6/17/2004	soil	HASL300	FD	15067-28-4	Pb-214	1.21	pCi/g	G,J	0.68
383PB0300.5X	6/17/2004	soil	EPA8270	FD	85-01-8	Phenanthrene	18	µg/kg	J	380
383PB0300.5X	6/17/2004	soil	UGTAISOPU	FD	13981-16-3	Pu-238	0.361	pCi/g		0.017
383PB0300.5X	6/17/2004	soil	UGTAISOPU	FD	15117-48-3	Pu-239	4.48	pCi/g		0.01
383PB0300.5X	6/17/2004	soil	EPA8270	FD	129-00-0	Pyrene	51	µg/kg	J	380
383PB0300.5X	6/17/2004	soil	SR7500	FD	10098-97-2	Sr-90	3.62	pCi/g	Y1	0.23
383PB0300.5X	6/17/2004	soil	HASL300	FD	14913-50-9	Tl-208	0.6	pCi/g	G	0.36
383PB0400.5	6/16/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.48	pCi/g	G	0.67
383PB0400.5	6/16/2004	soil	EPA6010	REG	7440-38-2	Arsenic	2.5	mg/kg		1
383PB0400.5	6/16/2004	soil	EPA6010	REG	7440-39-3	Barium	4900	mg/kg		520
383PB0400.5	6/16/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.6	mg/kg		0.52
383PB0400.5	6/16/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.95	pCi/g	G,J	0.45
383PB0400.5	6/16/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.19	mg/kg	B	0.52
383PB0400.5	6/16/2004	soil	EPA6010	REG	7440-47-3	Chromium	4	mg/kg		1
383PB0400.5	6/16/2004	soil	HASL300	REG	10045-97-3	Cs-137	46.9	pCi/g	G	0.2
383PB0400.5	6/16/2004	soil	EPA8260	REG	100-41-4	Ethylbenzene	1.6	µg/kg	J	5.2
383PB0400.5	6/16/2004	soil	EPA8270	REG	206-44-0	Fluoranthene	20	µg/kg	J	350
383PB0400.5	6/16/2004	soil	HASL300	REG	13966-00-2	K-40	31.7	pCi/g	G	1.7
383PB0400.5	6/16/2004	soil	EPA6010	REG	7439-92-1	Lead	30	mg/kg		0.31
383PB0400.5	6/16/2004	soil	EPA8260	REG	136777-61-2	M+P-Xylene	8.3	µg/kg		5.2
383PB0400.5	6/16/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.027	mg/kg	B	0.1
383PB0400.5	6/16/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	1.2	µg/kg	J,B	5.2
383PB0400.5	6/16/2004	soil	EPA8260	REG	95-47-6	O-Xylene	3.3	µg/kg	J	5.2
383PB0400.5	6/16/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.04	pCi/g	J	0.48
383PB0400.5	6/16/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.53	pCi/g	G,J	0.73
383PB0400.5	6/16/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.42	pCi/g		0.02
383PB0400.5	6/16/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	3.25	pCi/g		0.01
383PB0400.5	6/16/2004	soil	SR7500	REG	10098-97-2	Sr-90	0.76	pCi/g		0.29
383PB0400.5	6/16/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.51	pCi/g	G	0.23
383PB0500.5	6/16/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.79	pCi/g	G	0.46
383PB0500.5	6/16/2004	soil	EPA6010	REG	7440-38-2	Arsenic	2.1	mg/kg		1
383PB0500.5	6/16/2004	soil	EPA6010	REG	7440-39-3	Barium	550	mg/kg		10

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383PB0500.5	6/16/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.81	mg/kg		0.51
383PB0500.5	6/16/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.06	pCi/g	G,J	0.26
383PB0500.5	6/16/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.052	mg/kg	B	0.51
383PB0500.5	6/16/2004	soil	EPA6010	REG	7440-47-3	Chromium	2.5	mg/kg		1
383PB0500.5	6/16/2004	soil	HASL300	REG	10045-97-3	Cs-137	0.86	pCi/g	G	0.13
383PB0500.5	6/16/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	100	mg/kg	Z, H	5.1
383PB0500.5	6/16/2004	soil	HASL300	REG	13966-00-2	K-40	30.5	pCi/g	G	1.4
383PB0500.5	6/16/2004	soil	EPA6010	REG	7439-92-1	Lead	15	mg/kg		0.31
383PB0500.5	6/16/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.013	mg/kg	B	0.1
383PB0500.5	6/16/2004	soil	EPA8260	REG	75-09-2	Methylene Chloride	0.95	µg/kg	J,B	5.1
383PB0500.5	6/16/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.21	pCi/g	J	0.2
383PB0500.5	6/16/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.09	pCi/g	G,J	0.23
383PB0500.5	6/16/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.318	pCi/g		0.011
383PB0500.5	6/16/2004	soil	EPA6010	REG	7782-49-2	Selenium	0.65	mg/kg		0.51
383PB0500.5	6/16/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.65	pCi/g	G	0.12
383PH0101.0	6/9/2004	soil	EPA8260	REG	67-64-1	Acetone	14	µg/kg	J	38
383PH0101.0	6/9/2004	soil	EPA6010	REG	7440-38-2	Arsenic	14	mg/kg		1.9
383PH0101.0	6/9/2004	soil	EPA6010	REG	7440-39-3	Barium	6300	mg/kg		95
383PH0101.0	6/9/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.1	mg/kg		0.95
383PH0101.0	6/9/2004	soil	HASL300	REG	14733-03-0	Bi-214	1	pCi/g	G,J	0.56
383PH0101.0	6/9/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.39	mg/kg	B	0.95
383PH0101.0	6/9/2004	soil	EPA6010	REG	7440-47-3	Chromium	12	mg/kg		1.9
383PH0101.0	6/9/2004	soil	HASL300	REG	10045-97-3	Cs-137	19	pCi/g	G	0.3
383PH0101.0	6/9/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	21	mg/kg	Z,H	9.5
383PH0101.0	6/9/2004	soil	HASL300	REG	13966-00-2	K-40	8.1	pCi/g	G	3.2
383PH0101.0	6/9/2004	soil	EPA6010	REG	7439-92-1	Lead	19	mg/kg		2.8
383PH0101.0	6/9/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.046	mg/kg	B	0.19
383PH0101.0	6/9/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.29	pCi/g	J	0.49
383PH0101.0	6/9/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.25	pCi/g	G,J	0.53
383PH0101.0	6/9/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.305	pCi/g	J	0.01
383PH0101.0	6/9/2004	soil	SR7500	REG	10098-97-2	Sr-90	1.33	pCi/g		0.23
383PH0101.0	6/9/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.61	pCi/g	G	0.27
383PH0116.5	6/9/2004	soil	HASL300	REG	14331-83-0	Ac-228	2.4	pCi/g	G	0.49
383PH0116.5	6/9/2004	soil	EPA8260	REG	67-64-1	Acetone	7.2	µg/kg	J	21
383PH0116.5	6/9/2004	soil	EPA6010	REG	7440-38-2	Arsenic	2	mg/kg		1

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383PH0116.5	6/9/2004	soil	EPA6010	REG	7440-39-3	Barium	71	mg/kg		10
383PH0116.5	6/9/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.65	mg/kg		0.52
383PH0116.5	6/9/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.46	pCi/g	G,J	0.24
383PH0116.5	6/9/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.11	mg/kg	B	0.52
383PH0116.5	6/9/2004	soil	EPA6010	REG	7440-47-3	Chromium	1.7	mg/kg		1
383PH0116.5	6/9/2004	soil	HASL300	REG	13966-00-2	K-40	29.9	pCi/g	G	1.6
383PH0116.5	6/9/2004	soil	EPA6010	REG	7439-92-1	Lead	7.2	mg/kg		0.31
383PH0116.5	6/9/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.015	mg/kg	B	0.1
383PH0116.5	6/9/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.51	pCi/g	J	0.21
383PH0116.5	6/9/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.61	pCi/g	G,J	0.25
383PH0116.5	6/9/2004	soil	HASL300	REG	14913-50-9	Tl-208	1.05	pCi/g	G	0.12
383PH0216.0	6/9/2004	soil	HASL300	REG	14331-83-0	Ac-228	2.31	pCi/g	G	0.72
383PH0216.0	6/9/2004	soil	EPA6010	REG	7440-38-2	Arsenic	2.3	mg/kg		1.2
383PH0216.0	6/9/2004	soil	EPA6010	REG	7440-39-3	Barium	320	mg/kg		12
383PH0216.0	6/9/2004	soil	EPA8270	REG	56-55-3	Benzo(A)Anthracene	26	µg/kg	J	390
383PH0216.0	6/9/2004	soil	EPA8270	REG	50-32-8	Benzo(A)Pyrene	28	µg/kg	J	390
383PH0216.0	6/9/2004	soil	EPA8270	REG	205-99-2	Benzo(B)Fluoranthene	59	µg/kg	J	390
383PH0216.0	6/9/2004	soil	EPA8270	REG	207-08-9	Benzo(K)Fluoranthene	31	µg/kg	J	390
383PH0216.0	6/9/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.3	mg/kg		0.58
383PH0216.0	6/9/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.16	pCi/g	G,J	0.59
383PH0216.0	6/9/2004	soil	EPA8270	REG	117-81-7	Bis(2-Ethylhexyl)Phthalate	330	µg/kg	J	390
383PH0216.0	6/9/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.31	mg/kg	B	0.58
383PH0216.0	6/9/2004	soil	EPA6010	REG	7440-47-3	Chromium	1.4	mg/kg		1.2
383PH0216.0	6/9/2004	soil	EPA8270	REG	218-01-9	Chrysene	66	µg/kg	J	390
383PH0216.0	6/9/2004	soil	HASL300	REG	10045-97-3	Cs-137	142	pCi/g	G	0
383PH0216.0	6/9/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	330	mg/kg	M	5.8
383PH0216.0	6/9/2004	soil	EPA8270	REG	206-44-0	Fluoranthene	31	µg/kg	J	390
383PH0216.0	6/9/2004	soil	HASL300	REG	13966-00-2	K-40	33.7	pCi/g	G	1.9
383PH0216.0	6/9/2004	soil	EPA6010	REG	7439-92-1	Lead	12	mg/kg		0.35
383PH0216.0	6/9/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.027	mg/kg	B	0.12
383PH0216.0	6/9/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.73	pCi/g	J	0.62
383PH0216.0	6/9/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.74	pCi/g		0.02
383PH0216.0	6/9/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	5.37	pCi/g	J	0.01
383PH0216.0	6/9/2004	soil	EPA8270	REG	129-00-0	Pyrene	63	µg/kg	J	390
383PH0216.0	6/9/2004	soil	EPA6010	REG	7782-49-2	Selenium	0.42	mg/kg	B	0.58

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383PH0216.0	6/9/2004	soil	SR7500	REG	10098-97-2	Sr-90	2.84	pCi/g		0.25
383PH0216.0	6/9/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.78	pCi/g	G	0.33
383PH0217.5	6/9/2004	soil	HASL300	REG	14331-83-0	Ac-228	2.27	pCi/g	G	0.6
383PH0217.5	6/9/2004	soil	EPA8260	REG	67-64-1	Acetone	25	µg/kg		21
383PH0217.5	6/9/2004	soil	EPA6010	REG	7440-38-2	Arsenic	1.7	mg/kg		1.1
383PH0217.5	6/9/2004	soil	EPA6010	REG	7440-39-3	Barium	3200	mg/kg		110
383PH0217.5	6/9/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.69	mg/kg		0.53
383PH0217.5	6/9/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.49	pCi/g	G,J	0.31
383PH0217.5	6/9/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.12	mg/kg	B	0.53
383PH0217.5	6/9/2004	soil	EPA6010	REG	7440-47-3	Chromium	3.3	mg/kg		1.1
383PH0217.5	6/9/2004	soil	HASL300	REG	10045-97-3	Cs-137	4.34	pCi/g	G	0.17
383PH0217.5	6/9/2004	soil	HASL300	REG	13966-00-2	K-40	33.2	pCi/g	G	1.4
383PH0217.5	6/9/2004	soil	EPA6010	REG	7439-92-1	Lead	12	mg/kg		0.32
383PH0217.5	6/9/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.011	mg/kg	B	0.11
383PH0217.5	6/9/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.4	pCi/g	J	0.22
383PH0217.5	6/9/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.42	pCi/g	G,J	0.31
383PH0217.5	6/9/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.154	pCi/g	J	0.02
383PH0217.5	6/9/2004	soil	EPA6010	REG	7440-22-4	Silver	0.48	mg/kg	B	1.1
383PH0217.5	6/9/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.8	pCi/g	G	0.16
383PH0306.5	6/9/2004	soil	HASL300	REG	14331-83-0	Ac-228	2.18	pCi/g	G	0.58
383PH0306.5	6/9/2004	soil	EPA8260	REG	67-64-1	Acetone	7.2	µg/kg	J	23
383PH0306.5	6/9/2004	soil	EPA6010	REG	7440-38-2	Arsenic	2	mg/kg		1.1
383PH0306.5	6/9/2004	soil	EPA6010	REG	7440-39-3	Barium	4000	mg/kg		110
383PH0306.5	6/9/2004	soil	EPA6010	REG	7440-41-7	Beryllium	2	mg/kg		0.57
383PH0306.5	6/9/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.72	pCi/g	G,J	0.33
383PH0306.5	6/9/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.24	mg/kg	B	0.57
383PH0306.5	6/9/2004	soil	EPA6010	REG	7440-47-3	Chromium	3.4	mg/kg		1.1
383PH0306.5	6/9/2004	soil	HASL300	REG	10045-97-3	Cs-137	1.33	pCi/g	G	0.14
383PH0306.5	6/9/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	1.9	mg/kg	J	5.7
383PH0306.5	6/9/2004	soil	HASL300	REG	13966-00-2	K-40	29	pCi/g	G	1.2
383PH0306.5	6/9/2004	soil	EPA6010	REG	7439-92-1	Lead	22	mg/kg		0.34
383PH0306.5	6/9/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.011	mg/kg	B	0.11
383PH0306.5	6/9/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.56	pCi/g	J	0.25
383PH0306.5	6/9/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.74	pCi/g	G,J	0.3
383PH0306.5	6/9/2004	soil	EPA6010	REG	7782-49-2	Selenium	0.31	mg/kg	B	0.57

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383PH0306.5	6/9/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.74	pCi/g	G	0.12
383PH0320.5	6/9/2004	soil	HASL300	REG	14331-83-0	Ac-228	2.3	pCi/g	G	0.51
383PH0320.5	6/9/2004	soil	EPA8260	REG	67-64-1	Acetone	7.9	µg/kg	J	22
383PH0320.5	6/9/2004	soil	EPA6010	REG	7440-38-2	Arsenic	1.8	mg/kg		1.1
383PH0320.5	6/9/2004	soil	EPA6010	REG	7440-39-3	Barium	260	mg/kg		11
383PH0320.5	6/9/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1	mg/kg		0.54
383PH0320.5	6/9/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.36	pCi/g	G,J	0.28
383PH0320.5	6/9/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.092	mg/kg	B	0.54
383PH0320.5	6/9/2004	soil	EPA6010	REG	7440-47-3	Chromium	3.4	mg/kg		1.1
383PH0320.5	6/9/2004	soil	HASL300	REG	10045-97-3	Cs-137	0.33	pCi/g	LT,G	0.14
383PH0320.5	6/9/2004	soil	HASL300	REG	13966-00-2	K-40	29.8	pCi/g	G	1.5
383PH0320.5	6/9/2004	soil	EPA6010	REG	7439-92-1	Lead	10	mg/kg		0.32
383PH0320.5	6/9/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.12	mg/kg		0.11
383PH0320.5	6/9/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.76	pCi/g	J	0.22
383PH0320.5	6/9/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.6	pCi/g	G,J	0.27
383PH0320.5	6/9/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.73	pCi/g	G	0.14
383PH0408.0	6/10/2004	soil	HASL300	REG	14331-83-0	Ac-228	2.02	pCi/g	G	0.55
383PH0408.0	6/10/2004	soil	EPA6010	REG	7440-38-2	Arsenic	2.4	mg/kg		1.1
383PH0408.0	6/10/2004	soil	EPA6010	REG	7440-39-3	Barium	4900	mg/kg		110
383PH0408.0	6/10/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.9	mg/kg		0.55
383PH0408.0	6/10/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.53	pCi/g	G,J	0.23
383PH0408.0	6/10/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.27	mg/kg	B	0.55
383PH0408.0	6/10/2004	soil	EPA6010	REG	7440-47-3	Chromium	3.4	mg/kg		1.1
383PH0408.0	6/10/2004	soil	HASL300	REG	10045-97-3	Cs-137	0.78	pCi/g	G	0.15
383PH0408.0	6/10/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	7.5	mg/kg	Z,H	5.5
383PH0408.0	6/10/2004	soil	HASL300	REG	13966-00-2	K-40	26.6	pCi/g	G	1.3
383PH0408.0	6/10/2004	soil	EPA6010	REG	7439-92-1	Lead	24	mg/kg		0.33
383PH0408.0	6/10/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.007	mg/kg	B	0.11
383PH0408.0	6/10/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.42	pCi/g	J	0.23
383PH0408.0	6/10/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.73	pCi/g	G,J	0.29
383PH0408.0	6/10/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.8	pCi/g	G	0.15
383PH0408.0X	6/10/2004	soil	HASL300	FD	14331-83-0	Ac-228	2.27	pCi/g	G	0.57
383PH0408.0X	6/10/2004	soil	EPA6010	FD	7440-38-2	Arsenic	2.3	mg/kg		1.1
383PH0408.0X	6/10/2004	soil	EPA6010	FD	7440-39-3	Barium	5200	mg/kg		110
383PH0408.0X	6/10/2004	soil	EPA6010	FD	7440-41-7	Beryllium	2	mg/kg		0.55

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383PH0408.0X	6/10/2004	soil	HASL300	FD	14733-03-0	Bi-214	1.62	pCi/g	G,J	0.31
383PH0408.0X	6/10/2004	soil	EPA6010	FD	7440-43-9	Cadmium	0.27	mg/kg	B	0.55
383PH0408.0X	6/10/2004	soil	EPA6010	FD	7440-47-3	Chromium	3.6	mg/kg		1.1
383PH0408.0X	6/10/2004	soil	HASL300	FD	10045-97-3	Cs-137	0.76	pCi/g	G	0.15
383PH0408.0X	6/10/2004	soil	EPA8015	FD	68334-30-5	Diesel-Range Organics	4.7	mg/kg	J	5.5
383PH0408.0X	6/10/2004	soil	HASL300	FD	13966-00-2	K-40	28.5	pCi/g	G	1.5
383PH0408.0X	6/10/2004	soil	EPA6010	FD	7439-92-1	Lead	23	mg/kg		0.33
383PH0408.0X	6/10/2004	soil	EPA7470	FD	7439-97-6	Mercury	0.007	mg/kg	B	0.11
383PH0408.0X	6/10/2004	soil	HASL300	FD	15092-94-1	Pb-212	2.54	pCi/g	J	0.22
383PH0408.0X	6/10/2004	soil	HASL300	FD	15067-28-4	Pb-214	1.81	pCi/g	G,J	0.28
383PH0408.0X	6/10/2004	soil	HASL300	FD	14913-50-9	Tl-208	0.87	pCi/g	G	0.14
383PH0418.5	6/10/2004	soil	HASL300	REG	14331-83-0	Ac-228	2.19	pCi/g	G	0.39
383PH0418.5	6/10/2004	soil	EPA8260	REG	67-64-1	Acetone	6.7	µg/kg	J	21
383PH0418.5	6/10/2004	soil	EPA6010	REG	7440-38-2	Arsenic	2.1	mg/kg		1.1
383PH0418.5	6/10/2004	soil	EPA6010	REG	7440-39-3	Barium	590	mg/kg		11
383PH0418.5	6/10/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.74	mg/kg		0.53
383PH0418.5	6/10/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.4	pCi/g	G,J	0.27
383PH0418.5	6/10/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.12	mg/kg	B	0.53
383PH0418.5	6/10/2004	soil	EPA6010	REG	7440-47-3	Chromium	1.7	mg/kg		1.1
383PH0418.5	6/10/2004	soil	EPA8260	REG	87-68-3	Hexachlorobutadiene	1.7	µg/kg	J	5.3
383PH0418.5	6/10/2004	soil	HASL300	REG	13966-00-2	K-40	31.7	pCi/g	G	1.4
383PH0418.5	6/10/2004	soil	EPA6010	REG	7439-92-1	Lead	6.4	mg/kg		0.32
383PH0418.5	6/10/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.017	mg/kg	B	0.11
383PH0418.5	6/10/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.68	pCi/g	J	0.22
383PH0418.5	6/10/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.33	pCi/g	G,J	0.3
383PH0418.5	6/10/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.83	pCi/g	G	0.14
383RB0100.5	6/1/2004	soil	HASL300	REG	14331-83-0	Ac-228	2.9	pCi/g	G	0.48
383RB0100.5	6/1/2004	soil	EPA6010	REG	7440-38-2	Arsenic	6.2	mg/kg		1.1
383RB0100.5	6/1/2004	soil	EPA6010	REG	7440-39-3	Barium	140	mg/kg		11
383RB0100.5	6/1/2004	soil	EPA8270	REG	56-55-3	Benzo(A)Anthracene	40	µg/kg	J	370
383RB0100.5	6/1/2004	soil	EPA8270	REG	50-32-8	Benzo(A)Pyrene	46	µg/kg	J	370
383RB0100.5	6/1/2004	soil	EPA8270	REG	205-99-2	Benzo(B)Fluoranthene	96	µg/kg	J	370
383RB0100.5	6/1/2004	soil	EPA8270	REG	207-08-9	Benzo(K)Fluoranthene	45	µg/kg	J	370
383RB0100.5	6/1/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.7	mg/kg		0.55
383RB0100.5	6/1/2004	soil	HASL300	REG	14913-49-6	Bi-212	3.2	pCi/g	G	1.9

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383RB0100.5	6/1/2004	soil	EPA8270	REG	117-81-7	Bis(2-Ethylhexyl)Phthalate	260	µg/kg	J	370
383RB0100.5	6/1/2004	soil	EPA8270	REG	85-68-7	Butyl Benzyl Phthalate	780	µg/kg		370
383RB0100.5	6/1/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.56	mg/kg		0.55
383RB0100.5	6/1/2004	soil	EPA6010	REG	7440-47-3	Chromium	3.2	mg/kg		1.1
383RB0100.5	6/1/2004	soil	EPA8270	REG	218-01-9	Chrysene	74	µg/kg	J	370
383RB0100.5	6/1/2004	soil	HASL300	REG	10045-97-3	Cs-137	114	pCi/g	G	0
383RB0100.5	6/1/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	9.6	mg/kg	Z,H	5.5
383RB0100.5	6/1/2004	soil	EPA8270	REG	84-74-2	Di-N-Butyl Phthalate	4500	µg/kg	E	370
383RB0100.5	6/1/2004	soil	EPA8270	REG	206-44-0	Fluoranthene	91	µg/kg	J	370
383RB0100.5	6/1/2004	soil	HASL300	REG	13966-00-2	K-40	27.8	pCi/g	G	1.4
383RB0100.5	6/1/2004	soil	EPA6010	REG	7439-92-1	Lead	18	mg/kg		0.33
383RB0100.5	6/1/2004	soil	EPA7470	REG	7439-97-6	Mercury	0.16	mg/kg		0.11
383RB0100.5	6/1/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.96	pCi/g	J	0.52
383RB0100.5	6/1/2004	soil	EPA8270	REG	85-01-8	Phenanthrene	42	µg/kg	J	370
383RB0100.5	6/1/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.166	pCi/g	J	0.018
383RB0100.5	6/1/2004	soil	EPA8270	REG	129-00-0	Pyrene	93	µg/kg	J	370
383RB0100.5	6/1/2004	soil	HASL300	REG	15623-47-9	Th-227	4.1	pCi/g	J	2.3
383RB0100.5	6/1/2004	soil	HASL300	REG	15065-10-8	Th-234	7.2	pCi/g	G,TI	4
383RB0100.5	6/1/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.85	pCi/g	G	0.25
383RB0100.5RR1	6/1/2004	soil	EPA8270	RE	56-55-3	Benzo(A)Anthracene	60	µg/kg	J	740
383RB0100.5RR1	6/1/2004	soil	EPA8270	RE	50-32-8	Benzo(A)Pyrene	39	µg/kg	J	740
383RB0100.5RR1	6/1/2004	soil	EPA8270	RE	205-99-2	Benzo(B)Fluoranthene	84	µg/kg	J	740
383RB0100.5RR1	6/1/2004	soil	EPA8270	RE	117-81-7	Bis(2-Ethylhexyl)Phthalate	230	µg/kg	J	740
383RB0100.5RR1	6/1/2004	soil	EPA8270	RE	85-68-7	Butyl Benzyl Phthalate	630	µg/kg	J	740
383RB0100.5RR1	6/1/2004	soil	EPA8270	RE	218-01-9	Chrysene	63	µg/kg	J	740
383RB0100.5RR1	6/1/2004	soil	EPA8270	RE	84-74-2	Di-N-Butyl Phthalate	5100	µg/kg		740
383RB0100.5RR1	6/1/2004	soil	EPA8270	RE	206-44-0	Fluoranthene	86	µg/kg	J	740
383RB0100.5RR1	6/1/2004	soil	EPA8270	RE	85-01-8	Phenanthrene	43	µg/kg	J	740
383RB0200.5	6/1/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.64	pCi/g	G	0.5
383RB0200.5	6/1/2004	soil	EPA6010	REG	7440-38-2	Arsenic	7.1	mg/kg		1
383RB0200.5	6/1/2004	soil	EPA6010	REG	7440-39-3	Barium	180	mg/kg		10
383RB0200.5	6/1/2004	soil	EPA8270	REG	56-55-3	Benzo(A)Anthracene	56	µg/kg	J	340
383RB0200.5	6/1/2004	soil	EPA8270	REG	50-32-8	Benzo(A)Pyrene	52	µg/kg	J	340
383RB0200.5	6/1/2004	soil	EPA8270	REG	205-99-2	Benzo(B)Fluoranthene	120	µg/kg	J	340
383RB0200.5	6/1/2004	soil	EPA8270	REG	207-08-9	Benzo(K)Fluoranthene	41	µg/kg	J	340

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383RB0200.5	6/1/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.86	mg/kg		0.52
383RB0200.5	6/1/2004	soil	HASL300	REG	14733-03-0	Bi-214	1.12	pCi/g	G,J	0.29
383RB0200.5	6/1/2004	soil	EPA8270	REG	117-81-7	Bis(2-Ethylhexyl)Phthalate	540	µg/kg	J	340
383RB0200.5	6/1/2004	soil	EPA6010	REG	7440-47-3	Chromium	9.1	mg/kg		1
383RB0200.5	6/1/2004	soil	EPA8270	REG	218-01-9	Chrysene	84	µg/kg	J	340
383RB0200.5	6/1/2004	soil	HASL300	REG	10045-97-3	Cs-137	7.63	pCi/g	G	0.15
383RB0200.5	6/1/2004	soil	EPA8270	REG	84-74-2	Di-N-Butyl Phthalate	81	µg/kg	J	340
383RB0200.5	6/1/2004	soil	EPA8270	REG	206-44-0	Fluoranthene	96	µg/kg	J	340
383RB0200.5	6/1/2004	soil	HASL300	REG	13966-00-2	K-40	24.3	pCi/g	G	1.6
383RB0200.5	6/1/2004	soil	EPA6010	REG	7439-92-1	Lead	18	mg/kg		0.31
383RB0200.5	6/1/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.59	pCi/g	J	0.24
383RB0200.5	6/1/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.96	pCi/g	G,J	0.33
383RB0200.5	6/1/2004	soil	EPA8270	REG	85-01-8	Phenanthrene	38	µg/kg	J	340
383RB0200.5	6/1/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.076	pCi/g		0.01
383RB0200.5	6/1/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	2.09	pCi/g	J	0.01
383RB0200.5	6/1/2004	soil	EPA8270	REG	129-00-0	Pyrene	73	µg/kg	J	340
383RB0200.5	6/1/2004	soil	HASL300	REG	14913-50-9	Tl-208	0.61	pCi/g	G	0.14
383RB0300.5	6/1/2004	soil	HASL300	REG	14331-83-0	Ac-228	1.26	pCi/g	G	0.36
383RB0300.5	6/1/2004	soil	EPA6010	REG	7440-38-2	Arsenic	5.3	mg/kg		1
383RB0300.5	6/1/2004	soil	EPA6010	REG	7440-39-3	Barium	260	mg/kg		10
383RB0300.5	6/1/2004	soil	EPA8270	REG	56-55-3	Benzo(A)Anthracene	170	µg/kg	J	340
383RB0300.5	6/1/2004	soil	EPA8270	REG	50-32-8	Benzo(A)Pyrene	200	µg/kg	J	340
383RB0300.5	6/1/2004	soil	EPA8270	REG	205-99-2	Benzo(B)Fluoranthene	460	µg/kg	J	340
383RB0300.5	6/1/2004	soil	EPA8270	REG	207-08-9	Benzo(K)Fluoranthene	230	µg/kg	J	340
383RB0300.5	6/1/2004	soil	EPA6010	REG	7440-41-7	Beryllium	0.84	mg/kg		0.52
383RB0300.5	6/1/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.87	pCi/g	G,J	0.29
383RB0300.5	6/1/2004	soil	EPA8270	REG	117-81-7	Bis(2-Ethylhexyl)Phthalate	1200	µg/kg	J	340
383RB0300.5	6/1/2004	soil	EPA8270	REG	85-68-7	Butyl Benzyl Phthalate	23	µg/kg	J	340
383RB0300.5	6/1/2004	soil	EPA6010	REG	7440-43-9	Cadmium	0.57	mg/kg		0.52
383RB0300.5	6/1/2004	soil	EPA6010	REG	7440-47-3	Chromium	8.7	mg/kg		1
383RB0300.5	6/1/2004	soil	EPA8270	REG	218-01-9	Chrysene	270	µg/kg	J	340
383RB0300.5	6/1/2004	soil	HASL300	REG	10045-97-3	Cs-137	23.4	pCi/g	G	0.1
383RB0300.5	6/1/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	3	mg/kg	J	5.2
383RB0300.5	6/1/2004	soil	EPA8270	REG	84-74-2	Di-N-Butyl Phthalate	79	µg/kg	J	340
383RB0300.5	6/1/2004	soil	EPA8270	REG	206-44-0	Fluoranthene	280	µg/kg	J	340

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383RB0300.5	6/1/2004	soil	HASL300	REG	13966-00-2	K-40	21.4	pCi/g	G	1.2
383RB0300.5	6/1/2004	soil	EPA6010	REG	7439-92-1	Lead	61	mg/kg		0.31
383RB0300.5	6/1/2004	soil	HASL300	REG	15092-94-1	Pb-212	1.52	pCi/g	J	0.26
383RB0300.5	6/1/2004	soil	HASL300	REG	15067-28-4	Pb-214	0.93	pCi/g	G,J	0.32
383RB0300.5	6/1/2004	soil	EPA8270	REG	85-01-8	Phenanthrene	79	µg/kg	J	340
383RB0300.5	6/1/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.151	pCi/g		0.023
383RB0300.5	6/1/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	0.85	pCi/g	J	0.02
383RB0300.5	6/1/2004	soil	EPA8270	REG	129-00-0	Pyrene	360	µg/kg		340
383RB0300.5	6/1/2004	soil	HASL300	REG	14913-50-9	TI-208	0.47	pCi/g	G	0.14
383RB0400.5	6/1/2004	soil	HASL300	REG	14331-83-0	Ac-228	2.46	pCi/g	G	0.43
383RB0400.5	6/1/2004	soil	EPA6010	REG	7440-38-2	Arsenic	4.5	mg/kg		1.1
383RB0400.5	6/1/2004	soil	EPA6010	REG	7440-39-3	Barium	190	mg/kg		11
383RB0400.5	6/1/2004	soil	EPA8270	REG	56-55-3	Benzo(A)Anthracene	140	µg/kg	J	360
383RB0400.5	6/1/2004	soil	EPA8270	REG	50-32-8	Benzo(A)Pyrene	230	µg/kg	J	360
383RB0400.5	6/1/2004	soil	EPA8270	REG	205-99-2	Benzo(B)Fluoranthene	620	µg/kg		360
383RB0400.5	6/1/2004	soil	EPA8270	REG	191-24-2	Benzo(G,H,I)Perylene	90	µg/kg	J	360
383RB0400.5	6/1/2004	soil	EPA8270	REG	207-08-9	Benzo(K)Fluoranthene	170	µg/kg	J	360
383RB0400.5	6/1/2004	soil	EPA6010	REG	7440-41-7	Beryllium	1.1	mg/kg		0.54
383RB0400.5	6/1/2004	soil	HASL300	REG	14733-03-0	Bi-214	0.7	pCi/g	G,J	0.31
383RB0400.5	6/1/2004	soil	EPA8270	REG	117-81-7	Bis(2-Ethylhexyl)Phthalate	76	µg/kg	J	360
383RB0400.5	6/1/2004	soil	EPA8270	REG	86-74-8	Carbazole	23	µg/kg	J	360
383RB0400.5	6/1/2004	soil	EPA6010	REG	7440-47-3	Chromium	4.9	mg/kg		1.1
383RB0400.5	6/1/2004	soil	EPA8270	REG	218-01-9	Chrysene	480	µg/kg		360
383RB0400.5	6/1/2004	soil	HASL300	REG	10045-97-3	Cs-137	7.06	pCi/g	G	0.13
383RB0400.5	6/1/2004	soil	EPA8270	REG	53-70-3	Dibenzo(A,H)Anthracene	27	µg/kg	J	360
383RB0400.5	6/1/2004	soil	EPA8015	REG	68334-30-5	Diesel-Range Organics	15	mg/kg	Z,H	5.4
383RB0400.5	6/1/2004	soil	EPA8270	REG	84-74-2	Di-N-Butyl Phthalate	45	µg/kg	J	360
383RB0400.5	6/1/2004	soil	EPA8270	REG	206-44-0	Fluoranthene	510	µg/kg		360
383RB0400.5	6/1/2004	soil	EPA8270	REG	193-39-5	Indeno(1,2,3-Cd)Pyrene	80	µg/kg	J	360
383RB0400.5	6/1/2004	soil	HASL300	REG	13966-00-2	K-40	27.3	pCi/g	G	1.4
383RB0400.5	6/1/2004	soil	EPA6010	REG	7439-92-1	Lead	22	mg/kg		0.32
383RB0400.5	6/1/2004	soil	EPA8270	REG	91-20-3	Naphthalene	18	µg/kg	J	360
383RB0400.5	6/1/2004	soil	HASL300	REG	15092-94-1	Pb-212	2.44	pCi/g	J	0.24
383RB0400.5	6/1/2004	soil	HASL300	REG	15067-28-4	Pb-214	1.04	pCi/g	G,J	0.26
383RB0400.5	6/1/2004	soil	EPA8270	REG	85-01-8	Phenanthrene	210	µg/kg	J	360

SAMPLE #	SAMPLE DATE	MATRIX	USER TEST PANEL	SAMPLE PURPOSE	CAS #	PARAMETER	RESULT	UNITS	Q	DETECT LIMIT
383RB0400.5	6/1/2004	soil	UGTAISOPU	REG	13981-16-3	Pu-238	0.232	pCi/g		0.03
383RB0400.5	6/1/2004	soil	UGTAISOPU	REG	15117-48-3	Pu-239	1.15	pCi/g	J	0.02
383RB0400.5	6/1/2004	soil	EPA8270	REG	129-00-0	Pyrene	430	µg/kg		360
383RB0400.5	6/1/2004	soil	HASL300	REG	14913-50-9	TI-208	0.74	pCi/g	G	0.12
383TR10	6/3/2004	water	EPA8260	TB	75-09-2	Methylene Chloride	0.97	µg/L	J,B	5
383TR10	6/3/2004	water	EPA8260	TB	108-88-3	Toluene	1.3	µg/L	J	5
383TR11	6/7/2004	water	EPA8260	TB	75-09-2	Methylene Chloride	0.87	µg/L	J,B	5
383TR13	6/8/2004	water	EPA8260	TB	67-64-1	Acetone	12	µg/L	J,B	20
383TR13	6/8/2004	water	EPA8260	TB	75-09-2	Methylene Chloride	0.85	µg/L	J,B	5
383TR14	6/9/2004	water	EPA8260	TB	67-64-1	Acetone	13	µg/L	J,B	20
383TR14	6/9/2004	water	EPA8260	TB	75-09-2	Methylene Chloride	5.8	µg/L	B	5
383TR15	6/10/2004	water	EPA8260	TB	67-64-1	Acetone	13	µg/L	J,B	20
383TR15	6/10/2004	water	EPA8260	TB	75-09-2	Methylene Chloride	15	µg/L	B	5
383TR16	6/11/2004	water	EPA8260	TB	75-09-2	Methylene Chloride	2.3	µg/L	J	5
383TR16	6/11/2004	water	EPA8260	TB	108-88-3	Toluene	1.1	µg/L	J	5
383TR17	6/12/2004	water	EPA8260	TB	75-09-2	Methylene Chloride	0.96	µg/L	J	5
383TR17	6/12/2004	water	EPA8260	TB	108-88-3	Toluene	0.61	µg/L	J	5
383TR18	6/13/2004	water	EPA8260	TB	75-09-2	Methylene Chloride	2	µg/L	J	5
383TR19	6/14/2004	water	EPA8260	TB	75-09-2	Methylene Chloride	1.3	µg/L	J	5
383TR19	6/14/2004	water	EPA8260	TB	108-88-3	Toluene	0.78	µg/L	J	5
383TR20	6/15/2004	water	EPA8260	TB	75-09-2	Methylene Chloride	1.5	µg/L	J	5
383TR21	6/16/2004	water	EPA8260	TB	75-09-2	Methylene Chloride	1.4	µg/L	J	5
383TR22	6/17/2004	water	EPA8260	TB	75-09-2	Methylene Chloride	1.3	µg/L	J	5
An X suffix indicates a duplicate sample.										
An RR1 suffix indicates the lab conducted a re-analysis at a higher dilution due to higher than expected results.										

Appendix B

**Data Quality Objective Process
for
CAU 383, Area 12 E-Tunnel Sites**

B.1.0 Seven-Step DQO Process Characterization of CAU 383 (Area 12 E-Tunnel Sites)

The DQO process is a planning approach based on the scientific method that is used to ensure that data collected during site characterization will provide sufficient and reliable information to identify, evaluate, and technically defend potentially viable corrective actions (i.e., no further action, closure in place, or clean closure). The existing information about the nature and extent of contamination at the three CASs in CAU 383 and associated sites is insufficient to evaluate and select preferred corrective actions. The CAU 383 investigation will be based on DQOs agreed to by representatives of NDEP and DTRA.

Three CASs comprise CAU 383:

- CAS 12-06-06, Muckpile
- CAS 12-25-02, Oil Spill
- CAS 12-28-02, Radioactive Material

In addition, the CAI will evaluate the ponds downgradient of the Muckpile, the drainage between the Muckpile and ponds, and the adjacent blower pad.

B.1.1 Step 1 - State the Problem

This step identifies the DQO planning team members, states the problem that has initiated the CAU 383 investigation, and develops the CSM.

B.1.1.1 Planning Team Members

The DQO planning team consists of representatives from NDEP, DTRA, NNSA/NSO, and the environmental engineering contractor. The primary decision-makers are NDEP, DTRA, and NNSA/NSO representatives. [Table B.1-1](#) lists representatives from each organization who attended the September 16, 2003, meeting held to present and discuss the DQOs for CAU 383.

**Table B.1-1
DQO Meeting Participants**

Participant	Affiliation
Tiffany Lantow	DTRA
Wayne Griffin	BN/DTRA
Greg Raab	NDEP
Steve Mergenmeier	Shaw/Quality Assurance
Stacey Alderson	Shaw/Health Physicist
Rick Deshler	Shaw/Project Manager
David Schrock	Shaw/Waste Management
Brian Hoenes	SNJV
Richard Marty	SNJV
Barb Deshler	Shaw/Technical

B.1.1.2 State the Problem

It is unknown whether COPCs exceeding PALs are present in or beneath the E-Tunnel sites, including the Muckpile CAS, the ponds, the drainage between the Muckpile and the ponds, the Oil Spill CAS, the Radioactive Material CAS, and/or the blower pad. It is also unknown whether COPCs have migrated from these sites. If contaminants are present in concentrations that exceed the PALs, they may present a risk to human health and/or the environment and have the potential for migrating off site. If contaminants are present, their nature and extent need to be determined and their risk to human health and/or the environment evaluated.

B.1.1.3 Conceptual Site Model

A CSM has been developed to describe potential exposure pathways from possible contaminant sources in the Area 12 E-Tunnel Sites. If the CSM is proven incorrect by the results of the environmental sampling, NDEP will be notified and the CAI rescoped. The following statements are assumptions and/or facts that were considered in developing the model:

- The Muckpile and ponds were placed on a thin veneer of alluvium overlying the tuffs of the Tunnel Formation and the Older Tunnel Beds and the slope facies carbonate rocks.
- The E-Tunnel Muckpile consists primarily of mining debris (rock) generated during the excavation phase of shaft construction; therefore, the bulk of the Muckpile is assumed to be uncontaminated material. The post-test portion, which includes disturbed geologic materials and construction/re-entry debris, comprises a small fraction of the Muckpile.

- The thickness of the Muckpile ranges from less than 5 ft at the west end of the Muckpile to approximately 100 ft at the north side of the Muckpile. The Muckpile is approximately 200 ft wide and 1,200 ft long in a northwest-southeast direction. The Muckpile is estimated to contain 356,000 yd³ of material.
- The drive-over and walk-over radiological surveys identified two areas with elevated radiological readings on the Muckpile: one area along the road by the blower pad, and one by the electrical substation by the blower pad.
- Arsenic is found in the native soils and may also be found in the Muckpile (NBMG, 1998). In addition, the Muckpile may also contain very small volumes of RCRA-regulated hazardous constituents and beryllium. The possible distribution of these COPCs is not known.
- The Muckpile does not have a liner at its base; however, it probably received very little free liquid waste. Although specific permeability data are lacking, low precipitation and high evaporation rates in this region would tend to limit downward leaching of contaminants within the Muckpile.
- Past surface activities of concern include equipment maintenance and storage of equipment and petroleum products. Releases to the Muckpile from surface activities may be locally significant, but vertical infiltration of contaminants is probably limited to less than 5 ft.
- There are six ponds 50 to 100 ft wide, extending a distance of approximately 1,200 ft down canyon in an easterly direction from the Muckpile.
- This characterization will include Ponds 1, 2, and 3, which extend a distance of approximately 350 ft down canyon from the Muckpile.
- Pond 1 is mostly covered by the Muckpile.
- Pond 2 is currently receiving E-Tunnel effluent. It will be allowed to dry out before it is characterized.
- Pond 3 is dry.
- The material in the ponds consists of fine-grained sediments that settled out of construction and groundwater from the E-Tunnel workings.
- The thickness of the material in the ponds is unknown.
- The most likely pathway for migration of contaminants away from the Muckpile is in stormwater runoff. Migration might also result when precipitation infiltrates into the thin, peripheral portions of the Muckpile and enters the native material and/or drains

downgradient along the contact between the fill and the underlying native alluvium or bedrock.

- Possible future uses of the Muckpile may include activities that might intrude no more than 7 ft into the Muckpile.
- The blower pad is located on the hill between the two portals and still has some equipment on it. Most of the pad is not accessible to the drill rig.
- The Oil Spill is located on the blower pad.
- The Radioactive Material area is a small fenced area at the entrance to the E-Tunnel Main portal.

The CSM was developed using these assumptions. It was postulated that the majority of the Muckpile does not contain COPCs, and if any COPCs are present, they are probably isolated. Because there are no records concerning the precise subsurface distribution of fill materials, the location of buried COPCs cannot be predicted. Operational knowledge and surface radiological surveys can be used to increase the probability of finding impacted areas of the Muckpile. The areas most likely to be affected are the areas where petroleum compounds were used for tunnel equipment maintenance activities, possibly resulting in releases to the surface and shallow subsurface (0 to 5 ft) soils. These releases, if present, are expected to have limited lateral and vertical extent. It is also possible, but unlikely, that the native soil beneath the Muckpile and ponds has been impacted by downward migration of COPCs. [Figure B.1-1](#) is a generalized drawing of the CSM.

B.1.2 Step 2 - Identify the Decision

This step develops the decision statement.

B.1.2.1 Develop the Decision Statement

Are there concentrations of COPCs present in the Muckpile, Oil Spill or Radioactive Material CASS; ponds; or blower pad that exceed the action levels and, if so, do they pose a threat to human health and/or the environment?

Figure B.1-1
Generalized Conceptual Site Model for CAU 383

B.1.3 Step 3 - Identify Inputs to the Decision

This step identifies the information needed, determines sources for information, determines the basis for establishing the action level, and identifies sampling and analysis methods that can meet the data requirements.

B.1.3.1 Information Needs and Information Sources

Inputs to the decision are centered on the sampling approach, which depends foremost on a reasonable CSM. The model provides a basis for development of the approach and ultimately the course of action that will be taken for the site. In turn, the CSM is tested and confirmed by the results of the sampling. The sampling will consist of collecting random and biased environmental samples from the Muckpile, the ponds, the native materials beneath the Muckpiles and ponds, and the drainages below the Muckpile and ponds. In addition, the areas identified as CAS 12-25-02, Oil Spill, and CAS 12-28-02, Radioactive Material, will be sampled separately.

Table B.1-2 lists the information needs, the source of information for each need, the proposed methods to collect the data, and the QA/QC data type. The data type is determined by the intended use of the resulting data in decision making. Data types are discussed in the following text.

B.1.3.1.1 Quantitative Data

Quantitative data directly measure the quantity or amount of a characteristic or component within the population of interest. These data require the highest level of QA/QC in collection and measurement systems because the intended use of the data is to resolve primary decisions (i.e., rejecting or accepting the null hypothesis) and/or verifying that closure standards have been met. Laboratory analytical data are generally considered quantitative.

B.1.3.1.2 Semiquantitative Data

Semiquantitative data indirectly measure the quantity or amount of a characteristic or component. Inferences are drawn about the quantity or amount of a characteristic or component because a correlation has been shown to exist between the indirect measurement and the results from a quantitative measurement. The QA/QC requirements on semiquantitative collection and measurement systems are high, but may not be as rigorous as a quantitative measurement system. Semiquantitative data contribute to decision making but are not used alone to resolve primary decisions.

Field-screening data are generally considered semiquantitative. The data are often used to guide investigations toward quantitative data collection.

Table B.1-2
Information Needs to Resolve the Decision
(Page 1 of 2)

Information Need	Information Source	Collection Method	Data Type
Identify the COPCs.	<ul style="list-style-type: none"> - Results of historical data review - Results of the walk-over and/or drive-over radiological survey 	<ul style="list-style-type: none"> - Review the source terms for all tests that could have contributed contaminants to the Muckpile. - Review historical data for chemicals that may have been used on site. - Review historical data for potential release information. 	Qualitative
Are any COPCs present in the Muckpile, Oil Spill, or Radioactive Material CASs; ponds; blower pad; or drainage?	Analytical results of soil samples	<ul style="list-style-type: none"> - Collect soil samples at random locations and at random depths in the Muckpile, ponds, and drainage utilizing a roto sonic drill rig. - Collect near-surface biased soil samples from the Oil Spill and Radioactive Material area using the roto sonic drill rig or hand tools. - Send samples to an off-site laboratory to be analyzed for chemical and radiological constituents. 	Quantitative
Are any COPCs present in the native material beneath the Muckpile, Oil Spill, or Radioactive Material CASs; ponds, or blower pad?	Analytical results of soil samples	<ul style="list-style-type: none"> - Collect soil samples of native material at various locations immediately beneath the Muckpile and ponds utilizing a roto sonic drill rig. - Send all samples to an off-site laboratory to be analyzed for chemical and radiological constituents. 	Quantitative
If COPCs are present in or beneath the Muckpile, Oil Spill, or Radioactive Material CASs; ponds, or blower pad, are the concentrations high enough to exceed PALs?	<ul style="list-style-type: none"> - Analytical results of soil samples collected with the drill rig - U.S. Environmental Protection Agency Region 9 Preliminary Remediation Goals (PRGs) (EPA, 2002) - <i>Nevada Administrative Code</i> 445.2272 (NAC, 2005) - Individual isotope and metals concentrations in background soil samples - Individual isotope and metals concentrations from published sources 	<ul style="list-style-type: none"> - Compare the analytical results from the off-site laboratory for the chemical and radiological data to the PALs taking into account that the site is an industrial facility in a nuclear and high explosives test zone. 	Quantitative

Table B.1-2
Information Needs to Resolve the Decision
(Page 2 of 2)

Information Need	Information Source	Collection Method	Data Type
If COPCs are present in concentrations that exceed the PALs, what is their extent?	<ul style="list-style-type: none"> - Analytical results of soil samples - Results of the walk-over and drive-over radiological survey - Field-screening results collected with the Electra - Analytical results from soil samples run on the on-site hyperpure Germanium (HPGe) (gamma counter) 	<ul style="list-style-type: none"> - The walk-over and/or drive-over survey will be used to determine the lateral extent of any contamination. - Boreholes will be continued until two consecutive drilling intervals are below the field-screening levels as determined from Electra and HPGe results (unless refusal is encountered) to define the vertical extent. 	Quantitative
If COPCs are present in concentrations that exceed PALs, is there a potential for migration?	<ul style="list-style-type: none"> - Analytical results of soil samples - Results of the walk-over and drive-over radiological survey - Stability and drainage surveys 	<ul style="list-style-type: none"> - Assess existing data for usability and collect geotechnical samples if needed. - Evaluate the results of the surveys to determine the stability of the Muckpile. 	Semiquantitative

B.1.3.1.3 Qualitative Data

Qualitative data identify or describe the characteristics or components of the population of interest. The QA/QC requirements are the least rigorous on data collection methods and measurement systems. The intended use of the data is for information purposes, to refine CSMs, and to guide investigations rather than resolve primary decisions. This measurement of quality is typically assigned to historical information and data where QA/QC may be highly variable or not known. Professional judgment is often used to generate qualitative data.

B.1.3.1.4 Determine the Basis for the Preliminary Action Levels

Laboratory analytical results for soils will be compared to the following PALs to evaluate whether COPCs are present at levels that may pose an unacceptable risk to human health and/or the environment:

- 100 mg/kg TPH in soil, per NAC 445A.2272, “Contamination of Soils: Establishment of Action Levels” (NAC, 2005)
- Background concentrations for metals when natural background exceeds the PRG, as is often the case with arsenic. Background is considered the highest measurement from soil samples taken as local background or from soil samples collected by the Nevada Bureau of Mines and Geology throughout the Nellis Air Force Range (NBMG, 1998; Moore, 1999).

- EPA *Region 9 Preliminary Remediation Goals* (EPA, 2002) for industrial soils, as based on future use of the site in a Nuclear and High Explosive Test Zone (DOE/NV, 1996a and b and 1998).
- The PALs for radionuclides are isotope-specific and defined as the higher of the maximum concentration for that isotope found in samples from undisturbed background locations in the vicinity of the Nevada Test Site (McArthur and Miller, 1989; US Ecology and Atlan-Tech, Inc., 1992; Black and Townsend, 1996), from any of the three background samples collected during the investigation, or the POC as specified in the *Nevada Test Site Performance Objective for Certification of Nonradioactive Hazardous Waste* (POC) (BN, 1995).

B.1.3.1.5 Potential Sampling Techniques and Appropriate Analytical Methods

B.1.3.1.5.1 Radiological Surveys

Radiological surveys will be used to help determine the presence and lateral extent of radiological contamination. Radiological surveys will follow standard procedures. Further information is provided in [Section B.1.7.1](#).

B.1.3.1.5.2 Soil Sampling

Rotosonic drilling and hand tools will be used to collect the soil samples. Soil sample collection and handling activities will follow standard procedures. Section 6.0 of the CAIP lists analytical methods and laboratory requirements (e.g., detection limits, precision, and accuracy) for the investigation. Sample volumes are laboratory- and method-specific and will be determined in accordance with laboratory requirements. Specific analyses required for the disposal of IDW are identified in Section 5.0 of the CAIP.

To ensure that laboratory analyses are sufficient to detect contamination in soil samples at concentrations exceeding the minimum reporting limit, chemical and/or radiological parameters of interest have been selected for the CAU. The chemical and radiological parameters are listed in [Table B.1-3](#).

**Table B.1-3
Analyses to Be Performed**

Analyses	Sample Type						
	Environmenta	Duplicat	Background	Full Lab QC	Field Blanks	Rinsates	Trip Blanks
Organics							
VOCs	X	X		X	X	X	X
SVOCs	X	X		X	X	X	
TPH-DRO	X	X		X	X	X	
Metals							
Total RCRA Metals	X	X	X	X	X	X	
Beryllium	X	X	X	X	X	X	
Radionuclides							
Gamma Spectrometry	X	X	X		X	X	
Isotopic Plutonium	X	X	X	X	X	X	
Total Strontium ^{a, b}	X	X	X	X	X	X	
Tritium (pond samples only)	X	X			X	X	

^a Total strontium uses a stable strontium carrier as opposed to a radioactive tracer.

^b Although total strontium is measured, the results are reported as Sr-90 because Sr-89 has too short a half life to be present.

The VOCs and SVOCs expected to be analyzed for in the investigation are listed in [Tables B.1-4](#) and [B.1-5](#), respectively.

B.1.4 Step 4 - Define the Boundaries of the Study

The purpose of this step is to define the target population of interest, specify the spatial and temporal features of the population that are pertinent for decision making, determine practical constraints on data collection, and define the scale of decision making relevant to target populations.

Table B.1-4
Proposed VOCs for Analysis

1,1,1-Trichloroethane	2-Chlorotoluene	Ethylbenzene
1,1,2-Trichloroethane	4-Methyl-2-pentanone	Iodomethane
1,1,1,2-Tetrachloroethane	Acetone	Isopropylbenzene
1,1,2,2-Tetrachloroethane	Benzene	Methyl tertiary butyl ether
1,2,3-Trichloropropane	Bromobenzene	Methylene chloride
1,2,4-Trimethyl-benzene	Bromochloromethane	n-Butylbenzene
1,2-Dibromo-3-chloropropane	Bromodichloromethane	n-Propyl benzene
1,2-Dibromoethane	Bromoform	Sec-butyl benzene
1,1-Dichloroethane	Bromomethane	Styrene
1,1-Dichloroethene	Carbon disulfide	Tert-butyl benzene
cis-1,2-Dichloroethene	Carbon tetrachloride	Tetrachloroethene
trans-1,2-Dichloroethene	Chlorobenzene	Toluene
1,2-Dichloroethane	Chloroethane	Trichloroethene
1,2-Dichloropropane	Chloroform	Trichlorofluoromethane
1,3,5-Trimethylbenzene	Chloromethane	Trichlorotrifluoroethane
cis-1,3-Dichloropropene	Dibromochloromethane	Vinyl acetate
trans-1,3-Dichloropropene	Dibromomethane	Vinyl chloride
2-Butanone	Dichlorodifluoromethane	Xylene

Table B.1-5
Proposed SVOCs for Analysis

1,2,4-Trichlorobenzene*	Acenaphthylene	Di-n-butyl phthalate
1,2-Dichlorobenzene*	Aniline	Di-n-octyl phthalate
1,3-Dichlorobenzene*	Anthracene	Fluoranthene
1,4-Dichlorobenzene	Benzo(a)anthracene	Fluorene
2,4,5-Trichlorophenol	Benzo(a)pyrene	Hexachlorobenzene
2,4,6-Trichlorophenol	Benzo(b)fluoranthene	Hexachlorobutadiene*
2,4-Dichlorophenol	Benzo(g,h,i)perylene	Hexachlorocyclopentadiene
2,4-Dimethylphenol	Benzo(k)fluoranthene	Hexachloroethane
2,4-Dinitrophenol	Benzoic acid	Indeno(1,2,3-cd)pyrene
2,4-Dinitrotoluene	Benzyl alcohol	Isophorone
2,6-Dinitrotoluene	Bis(2-chloroethoxy) methane	Naphthalene*
2-Chloronaphthalene	Bis(2-chloroethyl)ether	Nitrobenzene
2-Chlorophenol	Bis(2-chloroisopropyl)ether	N-Nitroso-di-n-propylamine
2-Methylphenol	Bis(2-ethylhexyl) phthalate	N-Nitrosodimethylamine
2-Nitroaniline	Butyl benzyl phthalate	N-Nitrosodiphenylamine
3,3'-Dichlorobenzidine	Carbazole	Pentachlorophenol
4-Bromophenyl phenyl ether	Chrysene	Phenanthrene
4-Chloroaniline	Dibenzo(a,h)anthracene	Phenol
4-Methylphenol	Dibenzofuran	Pyrene
4-Nitrophenol	Diethyl phthalate	Pyridine
Acenaphthene	Dimethyl phthalate	

* May be reported with VOCs

B.1.4.1 Define the Target Population

The target populations for the characterization are:

- a. The material in the Muckpile, Oil Spill, and Radioactive Material area, and ponds
- b. The native material underlying the Muckpile, Oil Spill, and Radioactive Material area, and ponds to a depth of no more than 5 ft
- c. The muck underlying the Radioactive Material CAS near the portal

B.1.4.2 Identify the Spatial and Temporal Boundaries

The horizontal boundaries of the study area are the edges of the Muckpile, Oil Spill, and ponds to the extent that elevated radiological readings were identified by the drive-over and/or walk-over surveys. The vertical boundary is 2 to 5 ft below the bottom of the Muckpile and ponds or until drill refusal (defined as requiring more than 15 minutes to drill 1 ft). The Radioactive Material is located within the spatial boundaries of the Muckpile. The study area also includes undisturbed background sample locations outside, but adjacent to, the Muckpile boundaries. There are no temporal constraints on the characterization.

B.1.4.3 Identify Practical Constraints on the Characterization

The practical constraints on the investigation are the capability of the drill to penetrate the Muckpile and native material, the ability to get the drill onto the sample locations, and the weather, all of which can impact the field work.

B.1.4.4 Define the Scale of the Decision Making

The scale of decision making is defined as the Muckpile, consisting of two CASs as one unit, the ponds as a separate unit, the drainage between the Muckpile and ponds as a separate unit, and the blower pad (including the Oil Spill) on the bench above the Muckpile as a fourth unit. Dividing the units in this manner allows the corrective actions to be tailored to the different media that may be contaminated.

B.1.5 Step 5 - Develop a Decision Rule

This step integrates outputs from the previous steps into a decision rule ("If..., then...") statement. This rule describes the conditions under which possible alternative actions would be chosen.

B.1.5.1 Specify the Population Parameter

The population parameter is the maximum observed concentration of each COPC within the target population. For radiological surveys, the maximum observed concentration of each COPC will be the population parameter. If sampling is performed to support the radiological survey results, the maximum observed concentration of each COPC identified in the sample will be the population parameter. Radiological sampling results will supersede radiological survey results.

B.1.5.2 Choose an Action Level

Action levels are defined in [Section B.1.3.1.4](#).

B.1.5.3 Measurement and Analysis Methods

Radiological surveys and soil sampling and analysis, identified in [Sections B.1.7.1](#) and [B.1.7.2](#), will be used to identify the presence and location of COPCs.

The measurement and analysis methods referenced in the Industrial Sites QAPP (NNSA/NV, 2002) are capable of achieving the expected range of values to resolve the Primary Decision. The detection limit of the measurement method to be used must be less than the action level for each COPC unless otherwise specified in the CAIP.

B.1.5.4 Decision Rule

The following decision rules are applicable to the CAU 383 investigation and will be used to guide the investigation and data evaluation:

- If laboratory results for the soil samples indicate the presence of COPCs above the PALs, then a CADD will be prepared.
- If the laboratory results for the soil samples do not indicate the presence of COPCs above the PALs, then a CADD or CADD/CR will be prepared.

The PALs are defined in [Section B.1.3.1.4](#).

B.1.6 Step 6 - Specify the Tolerable Limits on the Decision Errors

Only validated analytical results (quantitative data) will be used to determine whether COPCs are present, unless otherwise stated. The baseline condition, or null hypothesis, assumed for this site is that COPCs above the action levels are present in the Muckpile. The alternate hypothesis is that COPCs above the action levels are not present in the Muckpile. Based on these

hypotheses, two types of decision errors are possible, false positive and false negative. This CAIP has been designed to minimize both types of errors.

B.1.6.1 False Positive Decision Error

The consequences of a false positive are: (1) the corrective action could be needlessly expanded to encompass a greater quantity of media than is necessary, and (2) media incorrectly judged to be contaminated could be treated as regulated waste rather than unregulated waste. Both of these consequences could lead to increased corrective action and waste disposal costs.

B.1.6.2 False Negative Decision Error

The consequences of a false negative are: (1) regulated contaminants might not be appropriately addressed by the corrective action, (2) contaminated media could be wrongly classified as non contaminated, and (3) contaminated media might be disposed of improperly. These consequences could result in unacceptable risks to human health and the environment and potential fines from regulatory agencies.

B.1.6.3 Statistical Model

A statistical analysis was conducted to determine the answer to two questions. The first question is, were sufficient samples taken to ensure a 90 percent confidence level in the mean COPC concentration? The second question is, does the mean concentration exceed the regulatory threshold (RT)?

The EPA has defined RTs for many chemicals and metals in soil. However, RTs for radionuclides in soil have not been promulgated for sites such as CAU 383, nor have they been defined for the radionuclide COPCs likely to be found at NNSA/NSO and/or DTRA sites. Therefore, the radionuclide RTs used for this analysis are the established radionuclide-specific background concentration or the “rad added” screening levels of the POC (BN, 1995), whichever is greater.

If chemical COPCs are found at the site, the RT values used to calculate whether sufficient samples have been taken will be the PALs as defined in Section 3.3 of the CAIP. For TPH, the PAL is 100 mg/kg in soil, and for RCRA-regulated contaminants, the EPA Region 9 PRGs for Industrial Soils (EPA, 2002) are the PALs.

To estimate the minimum number of samples required to characterize the E-Tunnel sites, the Cs-137 results from earlier investigations were used to provide input into equation 8 in SW-846

Chapter 9 (EPA, 1998). The Cs-137 results were used because Cs-137 is found in more of the tunnel samples than any other contaminant. The number of samples required to ensure a 90 percent confidence level was calculated using only the samples with Cs-137 concentrations exceeding the minimum detectable concentration (MDC).

Testing for the Number of Required Samples

The radionuclide analytical data from previous Muckpile, drainage, and pond characterizations were used to estimate the number of samples needed to characterize the E-Tunnel Muckpile, drainage, and ponds because there are no analytical data available from the E-Tunnel sites on which to make a determination. After the characterization is completed the procedure described in SW-846 Chapter 9 will again be used to confirm that sufficient samples were collected to characterize the site at the 90 percent confidence level (EPA, 1998).

Calculation of the Number of Samples

Determine the number of samples required to obtain a 90 percent confidence level for the E-Tunnel Muckpile, ponds, and drainage using the Cs-137 data.

$$n = t_{.20}^2 \times s^2 / (RT - O)^2$$

Required number of samples for the Muckpile:

n = minimum number of samples to ensure a 90 percent confidence level in the calculated mean concentration in the COPC

$t_{.20}^2$ = 1.680, the square of 1.296, the $t_{.20}$ value for 60 degrees of freedom, 90 percent confidence level, Table 9-2 of SW-846 (EPA, 1998)

s^2 = variance of the Cs-137 concentration in the positive Muckpile samples, 271,961 pCi/g

RT = 3 pCi/g

O = mean Cs-137 concentration in the positive Muckpile soil samples, 228.6 pCi/g

$n = t_{.20}^2 \times s^2 / (RT - O)^2 = (1.680 \times 271,961) / (3 - 228.6)^2 = 8.98$ samples

Required number of samples for the ponds:

n = minimum number of samples to ensure a 90 percent confidence level in the calculated mean concentration in the COPC

$t_{.20}^2$ = 1.698, the square of 1.303, the $t_{.20}$ value for 40 degrees of freedom, 90 percent confidence level, Table 9-2 of SW-846 (EPA, 1998)

s^2 = variance of the Cs-137 concentration in the positive pond samples, 20,064 pCi/g

RT = 3 pCi/g

O = mean Cs-137 concentration in the positive pond soil samples, 69.32 pCi/g

n = $t_{.20}^2 \times s^2 / (RT - O)^2 = (1.798 \times 20,064) / (3 - 69.32)^2 = 7.75$ samples

Required number of samples for the drainage:

n = minimum number of samples to ensure a 90 percent confidence level in the calculated mean concentration in the COPC

$t_{.20}^2$ = 1.6796, the square of 1.296, the $t_{.20}$ value for 90 degrees of freedom, 90 percent confidence level, Table 9-2 of SW-846 (EPA, 1998)

s^2 = variance of the Cs-137 concentration in the positive ravine samples, 2,962 pCi/g

RT = 3 pCi/g

O = mean Cs-137 concentration in the positive drainage soil samples, 20.02 pCi/g

n = $t_{.20}^2 \times s^2 / (RT - O)^2 = (1.6796 \times 2,962) / (3 - 20.02)^2 = 17.17$ samples

In addition to the calculated number of required samples, decision performance curve graphs were prepared using the same data from the previous Muckpile, pond, and drainage characterizations. The number of samples was calculated using a simple random sampling strategy. The action level (the lower limit on the graph) was set at the POC (BN, 1995). The upper bound of the gray area was set at the action level plus one standard deviation of the data from the previous investigations.

Figure B.1-2
Decision Performance Curve for Cesium-137 in
Muckpiles from Previous Investigations

The graphs are presented in [Figures B.1-2, B.1-3, and B.1-4](#). The decision performance curves are in agreement with the results from the 90 percent confidence level calculations.

The number of samples required to characterize the Muckpile, ponds, and drainage were multiplied by a factor of safety of 2 to provide additional assurance that the 90 percent confidence level would be reached.

n+ (Muckpile)	=	8.98 samples x 2	=	17.96 samples (round up)	=	18 samples
n+ (ponds)	=	7.75 samples x 2	=	15.5 samples (round up)	=	16 samples
n+ (drainage)	=	17.17 samples x 2	=	34.34 samples (round up)	=	35 samples

Figure B.1-3
Decision Performance Curve for Cesium-137 in
Ponds from Previous Investigation

The sampling program for CAU 383 was designed to provide sufficient data to allow a statistical determination of whether enough samples were collected to adequately characterize the site. This determination will be made using the procedures described in Chapter 9 of the EPA publication SW-846, *Test Methods for Evaluating Solid Waste* (EPA, 1998). The mean concentration (or activity) and standard deviation of the Cs-137 concentration in the Muckpile, ponds, and drainage soils will be used to calculate the number of samples necessary to make the determination with a 90 percent confidence level.

B.1.6.4 Quality Assurance/Quality Control

Radiological survey instruments will be calibrated in accordance with the manufacturer's instructions, and periodic calibrations will be performed in accordance with approved procedures.

Figure B.1-4
Decision Performance Curve for Cesium-137 in
Drainages from Previous Investigations

Quality control samples will be collected as required by established procedures. The required QC samples include:

- Trip blanks (one per sample cooler containing VOC environmental samples)
- Equipment blanks (one per sampling event for each type of decontamination procedure)
- Source blanks (one per source of water for decontamination and 1 from the water tank the first time it is filled); one sample can fill both requirements.
- Field duplicates (minimum of one per matrix per 20 environmental samples)
- Field blanks (minimum of one per 20 environmental samples); additional samples may be collected at the discretion of the SS if conditions change.

- Matrix spike/matrix spike duplicate (minimum of one per matrix per 20 environmental samples), not needed for some radioanalytical measurements (e.g., gamma spectrometry)

Additional QC samples may be submitted based on site conditions.

Data Quality Indicators of precision, accuracy, comparability, completeness, and representativeness are defined in the Industrial Sites QAPP (NNSA/NV, 2002). Site-specific DQIs are discussed in more detail in Section 6.0 of the CAIP.

B.1.7 Step 7 - Optimize the Design

The site characterization will consist of collecting both random and biased soil samples from the Muckpile, ponds, and the drainage downgradient from the Muckpiles and ponds. The sampling program has been optimized by conducting preliminary drive-over and walk-over radiological surveys to help guide the biased sampling, by determining the location and number of samples to collect, and by determining which parameters to analyze for. The COPCs for CAU 383 listed in [Section B.1.3.1.5.2](#) are TPH-DRO, VOCs, SVOCs, total RCRA metals, and radionuclides. All environmental samples will be analyzed for these parameters with the exception of the background samples, which will be analyzed for radionuclides and RCRA metals only. Sample locations identified on the surface of the Muckpile are biased to reflect areas where preliminary radiological surveys identified elevated radiological readings, there is visible staining, or work processes may have impacted the Muckpile surface soils.

B.1.7.1 Radiological Survey Methodologies and Instruments

Radiological surveys were conducted at CAU 383 to define the presence and lateral extent of radiological contaminants.

A combination of walk-over surveys using hand-held instruments and drive-over surveys using a vehicle-mounted detector were performed at CAU 383. Hand-held radiological survey instruments such as the NE Technology Electra, Eberline E-600, TSA-PRM-470B, and Bicon mRem, or equivalent were used and the Dual Large-Area Plastic Scintillator with a TSA-VMR-3 controller was used as the vehicle-mounted instrument.

Additional equipment and software used in the radiological data collection and processing include a Trimble global positioning system receiver and associated laptop computers used to log and process the walk-over and drive-over radiological data. The mapping program Surfer was used to plot data on site maps.

B.1.7.2 Intrusive Investigation

Intrusive investigations will be conducted at CAU 383 to determine whether COPCs are present. Samples will be collected from predetermined random and biased locations. Selection of biased locations will be based on the results of the radiological surveys, a review of the operational history, and visual inspection of the CAU.

Borehole and sampling locations on the Muckpile ([Figure B.1-5](#)) and the drainage ([Figure B.1-6](#)) were identified using a simple random sampling strategy. Borehole and sampling locations in the ponds ([Figure B.1-7](#)) were identified using a stratified random sampling strategy. Additional locations were identified to be used in the event that not all of the identified locations can be utilized. [Table B.1-6](#) shows the random intrusive investigation locations, as well as biased locations that have been identified. The Muckpile, the drainage, and the ponds are considered as separate units because different historical data were used to determine the number of samples needed to adequately characterize each area.

Rotosonic drilling will be the primary tool used to collect the soil samples for laboratory analysis to determine whether COPCs are present in the Muckpile and ponds. Boreholes will be drilled 5 ft into the native material if it is alluvium, 2 ft if it is bedrock, or until refusal. If the bottom interval of the hole exceeds the field-screening levels, the hole will be continued at 2-ft intervals until there are two consecutive clean intervals or until drill refusal. If a drilling location cannot be accessed by the drill rig, hand augers or similar hand tools will be used to collect the soil samples.

The sampling strategies for each site are shown in [Figures B.1-8](#) through [B.1-12](#).

Figure B.1-5
Borehole and Sampling Locations on the Muckpile

Uncontrolled When Printed

Figure B.1-6
Borehole and Sampling Locations in the Ponds

Figure B.1-7
Borehole and Sampling Locations in the Drainage

Table B.1-6
Coordinates for Intrusive Investigation Locations
(Page 1 of 2)

Muckpile Sampling Locations					
Location	Easting	Northing	Location	Easting	Northing
1	637775	887855	11	638525	887425
2	637905	887825	12	638245	887415
3	637845	887815	13	638415	887405
A1 (alternate)	737715	887875	14	638305	887395
A2 (alternate)	637855	887825	15	638255	887385
A3 (alternate)	637895	887775	16	638505	887385
4	638265	887555	17	637935	887365
5	638295	887505	18	638215	887335
6	638455	887505	A4 (alternate)	638295	887645
7	638415	887485	A5 (alternate)	638115	887455
8	637885	887455	A6 (alternate)	638015	887425
9	638145	887435	A7 (alternate)	638395	887415
10	637955	887425	A8 (alternate)	638405	887335
Pond Sampling Locations					
Location	Easting	Northing	Location	Easting	Northing
P1-1	639075	887705	P2-6	887655	887665
P1-2	639015	887675	P2-7	639215	887655
P1-3	639045	887665	P2-8	639175	887625
P1-4	639075	887655	P2-9	639175	887615
P1-5 (alternate)	639035	887715	P2-10 (alternate)	639222	887665
P1-6 (alternate)	639035	887665	P2-11 (alternate)	639145	887625
P2-1	639135	887705	P2-12 (alternate)	639215	887615
P2-2	639125	887695	P3-1	639295	887655
P2-3	639145	887695	P3-2	639295	887625
P2-4	639215	887695	P3-3	639335	887615
P2-5	639225	887675	P3-4 (alternate)	639305	887635
Drainage Sampling Locations					
Location	Easting	Northing	Location	Easting	Northing
D-1	638585	887740	D-19	638805	887706
D-2	638595	887738	D-20	638815	887708

Table B.1-6
Coordinates for Intrusive Investigation Locations
(Page 2 of 2)

Drainage Sampling Locations					
Location	Easting	Northing	Location	Easting	Northing
D-3	638605	887730	D-21	638825	887712
D-4	638615	887728	D-22	638835	887719
D-5	638625	887728	D-23	638845	887720
D-6	638635	887728	D-24	638855	887722
D-8	638655	887727	D-26	638885	887720
D-9	638675	887731	D-27	638895	887720
D-10	638685	887730	D-28	638905	887722
D-11	638695	887728	D-29	638915	887722
D-12	638715	887732	D-30	638925	887721
D-10	638685	887730	D-28	638905	887722
D-11	638695	887728	D-29	638915	887722
D-12	638715	887732	D-30	638925	887721
D-13	638735	887725	D-31	638935	887722
D-14	638745	887721	D-32	638945	887722
D-15	638755	887713	D-33	638955	887721
D-16	638775	887709	D-34	638995	887711
D-17	638785	887713	D-35	639005	887714
D-18	638795	887710	D-36	639015	887712

Figure B.1-8
Sampling Strategy for the Muckpile

Figure B.1-9
Sampling Strategy for the Ponds

Figure B.1-10
Sampling Strategy for the Drainage

Figure B.1-11
Sampling Strategy for the Radioactive Material Area

Figure B.1-12
Sampling Strategy for the Oil Spill

B.2.0 References

BN, see Bechtel Nevada.

Bechtel Nevada. 1995. *Nevada Test Site Performance Objective for Certification of Nonradioactive Hazardous Waste*. G-E11/96.01, Rev. 0. Las Vegas, NV

Black, S.C., and Y.E. Townsend. 1996. *U.S. Department of Energy, Nevada Operations Office Environmental Data Report for the Nevada Test Site - 1994*. Las Vegas, NV.

DOE/NV, see U.S. Department of Energy, Nevada Operations Office.

EPA, see U.S. Environmental Protection Agency.

McArthur, R.D., and F.L. Miller, Jr. 1989. *Offsite Radiation Exposure Review Project (ORERP), Phase II Soils Programs*, DOE/NV/10384-23. Las Vegas, NV: Desert Research Institute.

Moore, J., Science Applications International Corporation. 1999. Memorandum to M. Todd (SAIC) entitled, "Background Concentrations for NTS and TTR Soil Samples." Las Vegas, NV.

NAC, see *Nevada Administrative Code*.

NBMG, see Nevada Bureau of Mines and Geology.

NNSA/NV, see U.S. Department of Energy, National Nuclear Security Administration Nevada Operations Office.

Nevada Administrative Code. 2005. NAC 445A.2272, "Water Controls." Carson City, NV.

Nevada Bureau of Mines and Geology. 1998. *Mineral and Energy Resource Assessment of the Nellis Air Force Range*, Open File Report 98-1. Las Vegas, NV.

U.S. Department of Energy, Nevada Operations Office. 1996a. *Final Environmental Impact Statement for the Nevada Test Site and Off-site Locations in the State of Nevada*, Volume 1, Chapters 1-9. Las Vegas, NV.

U.S. Department of Energy, Nevada Operations Office. 1996b. *Radiological Effluents Released from U.S. Continental Tests 1961 through 1992*, DOE/NV-317, Rev. 1. Las Vegas, NV

U.S. Department of Energy, Nevada Operations Office. 1998. *Nevada Test Site Resource Management Plan*, DOE/NV-518. Las Vegas, NV

U.S. Department of Energy, National Nuclear Security Administration Nevada Operations Office. 2002. *Industrial Sites Quality Assurance Project Plan*, Nevada Test Site, Nevada, NNSA/NV--372, Rev. 3. Las Vegas, NV.

US Ecology and Atlan-Tech, Inc. 1991. *Environmental Monitoring Report for the Proposed Ward Valley, California, Low-Level Radioactive Waste (LLRW) Facility*, Vols. 1 and 2, Version 2. Rosewell, GA: California Department of Health, Environmental Management Branch.

U.S. Environmental Protection Agency. 1998. *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, 3rd Edition, CD-ROM PB97-501928GEI. Washington, DC.

U.S. Environmental Protection Agency. 2002. *Region 9 Preliminary Remediation Goals (PRGs)*. San Francisco, CA.

Appendix C

Data Assessment

C.1.0 Data Assessment

The DQA process is the scientific evaluation of the investigation results to determine whether the Data Quality Objectives DQO criteria established in the CAU 383 CAIP were met and if the DQO decisions can be answered at the desired level of confidence. The DQO process ensures that the right type, quality, and quantity of data will be available to support the resolution of the decisions at an appropriate level of confidence. Using both the DQO and DQA processes helps to ensure that the DQO decisions are sound and defensible.

The DQA involves five steps that begin with a review of the DQOs and end with an answer to the DQO decisions. The five steps are briefly summarized below.

Step 1: Review the DQOs and Sampling Design - Review the DQO process to provide context for analyzing the data. State the primary statistical hypotheses; confirm the limits on the decision errors for committing false rejection (Type I) or false acceptance (Type II) decision errors; and review any special features, potential problems, or deviations to the sampling design.

Step 2: Conduct a Preliminary Data Review - The preliminary data review involves reviewing QA reports and inspecting the data both numerically and graphically, validating and verifying the data to ensure that the measurement systems performed in accordance with the criteria specified, and using the validated data to determine whether the quality of the data is satisfactory.

Step 3: Select the Test - Select the test based on the population of interest, population parameter, and the hypotheses. Identify the key underlying assumptions that could cause a change in one of the DQO questions.

Step 4: Verify the Assumptions - Perform tests of assumptions. If data are missing or are censored, determine the impact on the DQO decision error.

Step 5: Draw Conclusions from the Data - Perform the calculations required for the test.

C.1.1 Review the DQOs and Sampling Design

This section contains a review of the DQO process presented in Appendix A of the CAU 383 CAIP and [Appendix B](#) of this document. The DQO decisions are presented with the DQO provisions for limiting false negative or false positive decision errors. Special features, potential problems, or any deviations from the sampling design are also presented.

C.1.1.1 Review DQOs

The decision statement as presented in the CAU 383 CAIP: "Are there concentrations of COPCs present in the muckpile, ponds, oil spill or radioactive material CASs, or blower pad which exceed the action levels and, if so, do they pose a threat to human health and/or the environment?"

Decision Rules:

- If laboratory results for the soil samples indicate the presence of COPCs above the PALs, then a CADD will be prepared.
- If laboratory results for the soil samples do not indicate the presence of COPCs above the PALs, then a CADD or CADD/CR will be prepared.

Population Parameter: The mean plus one standard deviation of each analyte with observed results.

DQO Provisions to Limit False Negative Decision Error

A false negative decision error (where consequences are more severe) was controlled by meeting the following criteria:

1. Having a high degree of confidence that the combination of random and biased sampling strategies will identify COCs if present in the CASs.
2. Having a high degree of confidence that analyses conducted will be sufficient to detect any COCs present in the samples.
3. Having a high degree of confidence that the data is of sufficient quality and completeness.

Criterion 1:

The following methods (stipulated in the CAU 383 DQOs [DTRA, 2003]) were used in selecting the sample locations:

- Random locations based on methods described in Chapter 4 of *Statistical Methods for Environmental Pollution Monitoring* (Gilbert, 1987).
- Selection of biased sampling locations associated with professional judgment, site knowledge, and preliminary radiological walk-over and drive-over surveys.

This provides a high degree of confidence that sampling will detect any COCs that may be present.

Criterion 2:

All samples were analyzed using the analytical methods listed in Table 3-1 of the CAIP and for the chemical and radiological parameters listed in Table A.1-3 of the CAIP. [Table C.1-1](#) provides a reconciliation of samples analyzed to the planned analytical program.

Samples were analyzed for all of the analytical methods specified in the CAIP

Sample results were assessed against the DQI of sensitivity as defined in the Industrial Sites QAPP (NNSA/NV, 2002). The sensitivity acceptance criteria defined in the CAIP is that analytical detection limits will be less than the corresponding action level. This goal was not achieved for the chemical analyses listed in [Table C.1-2](#). All radiological analytes met the sensitivity goal. Results not meeting the sensitivity goal were not used in making DQO decisions and will therefore be considered as rejected data.

Table C.1-1
CAU 383 Number of Samples Submitted per Analyte

CAS or Location	ANALYTES							
	VOCs	SVOCs	TPH-DRO	Metals	Beryllium	Gamma Spectroscopy	Isotopic Plutonium	Strontium-90
12-06-06	68	68	68	68	68	68	68	68
12-25-02	9	9	9	9	9	9	9	9
12-28-02	4	4	4	4	4	4	4	4
Drainage	37	37	37	37	37	37	37	37
Ponds	16	16	16	16	16	16	16	16

Table C.1-2
Chemical Analytes Failing Sensitivity Criteria for CAU 383

Sample Number	Parameter	Result (Fg/kg)	Detection Limit (Fg/kg)	2004 Industrial PRG (Fg/kg)
383OB0800.5RR1	Benzo(A)Pyrene	23,000	250	210
383OB0100.5RR1	Dibenzo(A,H)Anthracene	3,400	250	210
383OB0200.5RR1	Dibenzo(A,H)Anthracene	3,400	250	210
383OB0800.5RR1	Dibenzo(A,H)Anthracene	6,900	500	210
383OB0800.5RR1	N-Nitroso-Di-N-Propylamine	6,900	290	250
383OB0100.5	N-Nitrosodimethylamine	1,700	73	34
383OB0800.5RR1	N-Nitrosodimethylamine	3,400	150	34
383OB0200.5	N-Nitrosodimethylamine	1,700	73	34
383OB0200.5RR1	N-Nitrosodimethylamine	3,400	150	34
383OB0700.5RR1	N-Nitrosodimethylamine	2,100	89	34
383OB0800.5	N-Nitrosodimethylamine	1,400	59	34
383OB0800.5RR1	N-Nitrosodimethylamine	6,900	290	34

Fg/kg = Micrograms per kilogram

Criterion 3:

To satisfy the third criterion, the entire dataset, as well as individual sample results, were assessed against the acceptance criteria for the DQIs of precision, accuracy, comparability, completeness, and representativeness, as defined in the Industrial Sites QAPP (NNSA/NV, 2002). The DQI acceptance criteria are presented in Table 6-1 of the CAIP. As presented in the following sections these goals were met for each DQI.

Precision

The duplicate precision is evaluated using the relative percent difference (RPD) or normalized difference. For the purpose of determining the data precision of chemical analyses, the RPD between duplicate analyses was calculated. For radionuclides, the RPD was not calculated unless both the sample and its duplicate had concentrations of the target radionuclide exceeding five times their MDC. Otherwise radionuclide, duplicate results were evaluated using the normalized difference. [Table C.1-3](#) provides the chemical and radiological precision analysis results for all constituents that were qualified for precision. The chemical analytes qualified for precision were lead and barium. Radionuclides qualified for precision were Th-227 and Pu-239.

**Table C.1-3
Precision Measurements**

Parameter	CAS Number	User Test Panel	Number of Analyses Qualified	Number of Measurements Performed	Percent within Criteria
Lead	7439-92-1	EPA6010B	9	134	93.3
Barium	7440-39-3	EPA6010B	15	130	8.5
Thorium-227	15623-47-9	HASL300	13	135	90.4
Plutonium-239	15117-48-3	UGTAISOPU	66	135	51.1

CAS = Chemical Abstract Number

EPA = U.S. Environmental Protection Agency, SW 846 methods (EPA, 1999 and 2002)

HASL = Health and Safety Laboratory

As shown in [Table C.1-3](#), the precision rate for lead, barium, and thorium were above the CAIP acceptance criterion of 80 percent; however, Pu-239 was below the acceptance criterion. The precision rate for all of the other constituents is 100 percent. The precision rate for Pu-239 was 51.1 percent; however, because the Muckpile has concentrations of Pu-239 above the FAL, a false negative will not impact the decision and will not significantly increase the potential risk to

human health or the environment. Because all of the other constituents exceed the acceptance criteria for precision, the dataset is determined to be acceptable for the DQI of precision.

Accuracy

For the purpose of determining data accuracy of sample analyses, environmental soil samples were evaluated and incorporated into the accuracy calculation. The results qualified for accuracy were associated with matrix spike recoveries that were outside control limits and could potentially be reported at concentrations lower or higher than actual concentration. [Table C.1-4](#) provides the chemical accuracy analysis results for all constituents qualified for accuracy. Accuracy rates are above the performance criterion of 80 percent specified in the CAIP for all parameters.

**Table C.1-4
Accuracy Measurements**

Parameter	CAS Number	User Test Panel	Number of Analyses Qualified	Number of Measurements Performed	Percent within Criteria
1,2,4-Trimethylbenzene	95-63-6	EPA8260	1	127	99.2
1,3,5-Trimethylbenzene	108-67-8	EPA8260	1	127	99.2
Acetone	67-64-1	EPA8260	1	127	99.2
Benzene	71-43-2	EPA8260	1	127	99.2
Ethylbenzene	100-41-4	EPA8260	1	127	99.2
Hexachlorobutadiene	87-68-3	EPA8270	1	132	99.2
Hexachlorobutadiene	87-68-3	EPA8260	1	127	99.2
M+P-Xylene	136777-61-2	EPA8260	1	127	99.2
Mercury	7439-97-6	EPA6010B	1	130	99.2
N-Propylbenzene	103-65-1	EPA8260	1	127	99.2
O-Xylene	95-47-6	EPA8260	1	127	99.2
Toluene	108-88-3	EPA8260	1	127	99.2
Methylene Chloride	75-09-2	EPA8260	2	127	98.4
Trichloroethene	79-01-6	EPA8260	3	127	97.6
Chlorobenzene	108-90-7	EPA8260	7	127	94.5
Lead	7439-92-1	EPA6010B	9	134	93.3
Barium	7440-39-3	EPA6010B	15	130	88.5

As the accuracy rate for all other constituents exceed the acceptance criteria for accuracy, the dataset is determined to be acceptable for the DQI of accuracy.

Representativeness

The DQO process as identified in Appendix A of the CAU 383 CAIP (DTRA, 2003) was used to address sampling and analytical requirements for CAU 383. During this process, appropriate locations were selected that enabled the samples collected to be representative of the population parameters identified in the DQO (random locations and biased locations that were most likely to encounter contamination). The sampling locations identified in the Criterion 1 discussion meet these criteria. Therefore, the analytical data acquired during the CAU 383 CAI are considered to be representative of the population parameters.

Comparability

Field sampling, as described in the CAU 383 CAIP (DTRA, 2003), was performed and documented in accordance with approved procedures that are comparable to standard industry practices. Approved analytical methods and procedures were used to analyze, report, and validate the data. These are comparable to other methods used not only in industry and government practices, but most importantly are comparable to other investigations conducted at the NTS. Therefore, project datasets are considered comparable to other datasets generated using these same standardized DOE procedures, thereby meeting the DQO requirements. Also, standard, approved field and analytical methods ensure that data were appropriate for comparison to the investigation action levels specified in the CAIP.

Completeness

The CAU 383 CAIP (DTRA, 2003) defines acceptable criteria for completeness to be 80 percent of CAS-specific non-critical analytes identified in the CAIP having valid results and 100 percent of critical analytes having valid results. Also, the dataset must be sufficiently complete to be able to make the DQO decisions. Critical analytes for CAU 383 are the COCs identified from previously investigated NTS muckpiles (arsenic, lead, TPH-DRO, Pu-239, Cs-137, and Co-60).

Rejected data (either qualified as rejected or data that failed the criterion of sensitivity) were not used in the resolution of DQO decisions and are not counted toward meeting the completeness acceptance criterion. Table C.1-5 shows the data rejected because of completeness. Because none of the rejected data are critical analytes and all of the qualified data exceed the 80 percent criteria for completeness the dataset is considered complete for purposes of making the DQO decisions.

**Table C.1-5
Rejected Measurements for Completeness**

Parameter	CAS Number	User Test Panel	Number of Analyses Qualified	Number of Measurements Performed	Percent within Criteria
Benzo(A)Anthracene	56-55-3	EPA8270	2	132	98.5
Chrysene	218-01-9	EPA8270	4	132	97
Pyrene	129-00-0	EPA8270	4	132	97
Bis(2-Ethylhexyl)Phthalate	117-81-7	EPA8270	6	132	95.5
3,3'-Dichlorobenzidine	91-94-1	EPA8270	9	132	93.2
Butylbenzylphthalate	85-68-7	EPA8270	9	132	93.2
Di-N-Octylphthalate	117-84-0	EPA8270	9	132	93.2
Benzo(B)Fluoranthene	205-99-2	EPA8270	18	132	86.4
Benzo(K)Fluoranthene	207-08-9	EPA8270	18	132	86.4
Benzo(A)Pyrene	50-32-8	EPA8270	19	132	85.6
Benzo(G,H,I)Perylene	191-24-2	EPA8270	21	132	84.1
Ideno(1,2,3-CD)Pyrene	193-39-5	EPA8270	22	132	83.3
Dibenzo(A,H)Anthracene	53-70-3	EPA68270	24	132	81.8

DQO Provisions to Limit False Positive Decision Error

The false positive decision error was controlled by assessing the potential for false positive analytical results. Quality assurance/QC samples such as field blanks, trip blanks, laboratory control samples, and method blanks were used to determine whether a false positive analytical result may have occurred. Of the 52 QA/QC samples submitted, no false positive analytical results were detected.

Proper decontamination of sampling equipment, and the use of certified clean sampling equipment and containers, minimized the potential for cross contamination that could lead to a false positive analytical result.

C.1.1.2 Sampling Design

The CAIP made the following commitments for sampling:

1. Random sampling will be conducted at CAS 12-06-06, in the drainage below the Muckpile, and in Ponds 1, 2, and 3.

Result: All of the random locations identified by the simple random sampling method defined in Chapter 4 of *Statistical Methods for Environmental Pollution Monitoring* (Gilbert, 1987) were collected and analyzed. This included 40 samples from CAS 12-06-06 (the Muckpile), 35 from the drainage, and eight from the ponds.

2. Biased locations will be selected at CAS 12-06-06, CAS 12-25-02, CAS 12-28-02, and locations that are most likely to contain contaminated soil.

Result: Eight biased soil samples were collected at CAS 12-25-02, four were collected at CAS 12-28-02, 26 were collected at CAS 12-25-02, and six were collected in the ponds. The locations were identified through walk-over radiological surveys, visual inspection of the surface, or process knowledge.

C.1.2 Conduct a Preliminary Data Review

A preliminary data review was conducted by reviewing QA reports and inspecting the data. The contract analytical laboratories generate a QA non-conformance report when data quality do not meet contractual requirements. All data received from the analytical laboratories met contractual requirements, and no QA non-conformance reports were generated. Data were validated and verified to ensure that the measurement systems performed in accordance with the criteria specified. The validated dataset quality was found to be satisfactory.

C.1.3 Select the Test

The CAIP (DTRA, 2003) committed to using the procedure described in Chapter 9 of the EPA SW-846 Method (EPA, 1996) to answer two questions: 1) were enough samples collected to ensure a 90 percent confidence level in the mean COPC concentration, and 2) does the mean concentration exceed the regulatory threshold?

Because of the change in closure strategy agreed to by NDEP, DTRA, and NNSA/NSO, the regulatory threshold is now the risk based FAL instead of the PALs discussed in the CAIP. Comparing the average concentration of the most prevalent contaminants to their PAL and, if they exceed the PAL, comparing them to their respective FALs will also be used to help answer the questions.

C.1.4 SW-846 Evaluation

To answer the first question described in equation (8) of Table 9-1 in SW 846 was used. To answer the second question, equation (6) of Table 9-1 in SW-846 was used (EPA, 1996). Only random samples were used for this evaluation. Cesium-137 was chosen for conducting the calculations because it was the most prevalent contaminant found during the characterization. Both of these equations are presented and explained in Appendix B of this CADD/CR. The PAL screening level for Cs-137 is 7.3 pCi/g. The values used for the calculations and the results are presented in [Table C.1-6](#).

Based on the results of the calculations, an adequate number of samples were collected to meet the 90 percent confidence level that enough samples had been collected to characterize the sites except in the ponds. In comparing the 90 percent confidence level to the PAL, the confidence level exceeds the PAL in the Muckpile, the drainage, and the ponds. Because the PAL is exceeded in the ponds by almost 13 times, the fact that not enough samples were collected at that site has less importance. It would be more significant if the 90 percent confidence level were close to the PAL.

Table C.1-6
SW-846 Evaluation of the Number of Samples and
Comparison of 90% Confidence Level with the PAL

Variable	Pond Native	Pond Sediment	Drainage	Muckpile Native	Muckpile Muck
T _{.20}	1.638	1.638	1.307	1.333	1.323
T _{.20} ²	2.683	2.683	1.708	1.777	1.750
S ²	3.208	3469.040	402.249	4.980	11280.912
RT for Cs-137	7.3	7.3	7.3	7.3	7.3
Avg (BarX)	1.241	40.778	25.978	0.846	49.480
n collected	4	4	35	18	22
n needed*	"1"	8.305	1.970	"1"	11.098
Confidence Interval	1.467	48.238	4.431	0.701	29.959
90% Confidence	2.707	89.015	30.409	1.547	79.439
90%Confidence>7.3pCi/g	no	yes	yes	no	yes

Note: Only random samples were used in this evaluation.

* - Minimum samples needed are actually 0.234 and 0.212, respectively.

C.1.5 Verify the Assumptions

The results of the investigation support the assumptions identified in the CAU 383 DQOs and [Table C.1-7](#).

Table C.1-7
Key Assumptions
(Page 1 of 2)

Exposure Scenario	Exposure to contaminants is limited to industrial site workers, construction/remediation workers and military personnel conducting training. Exposure could occur through ingestion, inhalation, external exposure, or dermal contact.
	The investigation did not reveal any potential exposures that were not identified in the CSM.
Affected Media	Surface and subsurface soils in and below the Muckpile. Contamination of perched, deep, and regional groundwater is not a concern.
	The investigation results did not identify any affected media that was not identified in the CSM.

Table C.1-7
Key Assumptions
(Page 2 of 2)

Location of Contamination Release Points	The Muckpile, compressor pad, Radioactive Material area, drainage, and ponds may contain small volumes of RCRA-regulated constituents in addition to radiological constituents.
Transport Mechanisms	The investigation results confirmed this and did not reveal any potential releases off the Muckpile.
	Surface transport may occur as a result of storm water runoff. Contamination may migrate through the Muckpile into the native material as a result of rainwater infiltration.
	The investigation results did not confirm any transport mechanisms
Preferential Pathways	Percolation of precipitation through the soils of the Muckpile.
	The investigation did not identify any contaminant migration.
Lateral and Vertical Extent of Contamination	Contamination could be locally significant, but vertical infiltration of contaminants is probably limited to less than 5 ft.
	The investigation results confirmed this.
Groundwater Impacts	There are no groundwater impacts.
Future Land Use	Nonresidential, zoned for nuclear and high explosives tests.
	The investigation results did not reveal any future land uses other than those identified in the CSM.

C.1.6 Results

This section resolves the DQO decision for CAU 383.

C.1.6.1 Decision Rules for CAU 383

Decision Rule: If laboratory results for the soil samples indicate the presence of COPCs above the PALs, then a CADD will be prepared.

Result: Because the site was characterized and a CADD was prepared, the DOE and NDEP came to an agreement that a risk based approach could be used for characterizing the muckpiles. Because of this decision, NDEP agreed to allow existing muckpile CADDs that had been approved by NDEP to be re-evaluated using the risk-based approach. Using the risk-based approach FALs were exceeded for Am-241, Cs-137, Sr-90, Pu-238, and Pu-239.

Decision Rule: If laboratory results for the soil samples do not indicate the presence of COPCs above the PALs, then a CADD or CADD/CR will be prepared.

Result: Because of the change in the strategy for closing the muckpiles, a CADD/CR will be prepared that will proposed use restrictions for controlling the contaminated soils.

C.2.0 References

DTRA, see Defense Threat Reduction Agency.

Defense Threat Reduction Agency. 2003. *Corrective Action Investigation Plan for Corrective Action Unit 383: Area 12 E Tunnel Sites, Nevada Test Site, Nevada*, Rev. 0. February.

EPA, see U.S. Environmental Protection Agency.

Gilbert, R.O. 1987. *Statistical Methods for Environmental Pollution Monitoring*, Chapter 4. New York, NY: Van Nostrand Reinhold.

NNSA/NV, see U.S. Department of Energy, National Nuclear Security Administration Nevada Operations Office.

U.S. Department of Energy, National Nuclear Security Administration Nevada Operations Office. 2002. *Industrial Sites Quality Assurance Project Plan, Nevada Test Site, Nevada*, DOE/NV--372, Rev. 3. Las Vegas, NV.

U.S. Environmental Protection Agency. 1996. *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846 CD ROM PB97-501928GEI, which contains updates for 1986, 1992, 1994, and 1996. Washington, DC.

U.S. Environmental Protection Agency. 1999. *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846. 3rd Edition. Washington, DC.

U.S. Environmental Protection Agency. 2002. *Region 9 Preliminary Remediation Goals (PRGs)*. San Francisco, CA

Appendix D

Risk Assessment for CAU 383

D.1.0 Risk-Based Corrective Action Process

This section contains documentation of the ASTM Method E 1739-95 (ASTM, 1995) risk-based corrective action process as applied to CAU 383. The ASTM Method E 1739-95 defines three tiers or levels in evaluating DQO decisions involving increasingly more sophisticated analyses.

- Tier 1 – Sample results from source areas (highest concentrations) compared to the PALs based on generic (non-site-specific) conditions.
- Tier 2 – Sample results from exposure points compared to SSTLs calculated using site-specific inputs and Tier I formulas (from the ASTM procedure).
- Tier 3 – Sample results from exposure points compared to SSTLs and points of compliance calculated using chemical fate/transport and probabilistic modeling.

The risk based corrective action decision process stipulated in ASTM Method E 1739-95 is summarized in [Figure D.1-1](#).

D.1.1 Scenario

Corrective Action Unit 383 consists of the three CASs and two associated areas listed below.

- CAS 12-06-06, Muckpile
- CAS 12-25-02, Oil Spill
- CAS 12-28-02, Radioactive Material
- The drainage below the Muckpile
- The first three ponds below the Muckpile

Corrective Action Site 12-06-06 consists of the E-Tunnel Muckpile. E-Tunnel was mined horizontally into bedded ash flow tuffs underlying Rainier Mesa. It was used for nine nuclear

Figure D.1-1
ASTM Method E 1739-95 Risk-Based Corrective Action Decision Process

weapons effects tests between 1958 and 1977. The Muckpile consists of approximately 355,000 yd³ of material mined from the tunnel. The surface elevation at the top of the Muckpile is about 6,120 ft above mean sea level. The Muckpile was deposited in an easterly trend in front of the tunnel portals. The Muckpile is approximately 200 ft across and 1,200 ft long in an east-west direction. The thickness of the Muckpile ranges from less than 5 ft at the west end to approximately 100 ft at the northeast side.

Corrective Action Site 12-28-02 (Radioactive Material) is located at the E-Tunnel Main portal and is part of the Muckpile.

Corrective Action Site 12-25-02 (Oil Spill) is located on the blower pad, which is on a bench approximately 100 ft above the E-Tunnel south portal. The pad was constructed in the hillside and is about 100 ft long north to south and 50 ft wide. Fill on the pad varies in thickness from less than 1 ft next to the slope to about 10 ft on the north edge of the pad.

The drainage that was included in this investigation trends easterly along the base of the Muckpile. It includes approximately 750 ft of the drainage above the uppermost pond.

The first three ponds below the Muckpile received discharge water from E-Tunnel. Pond 1 is almost covered by the Muckpile. Ponds 2 and 3 did not have standing water but were too muddy to drive the drill rig on. Pond 2 is round and approximately 115 ft in diameter, and Pond 3 is 100 ft long by 50 ft wide. Ponds 4, 5, and 6 were not sampled because they are still active and receiving discharge water from E-Tunnel.

D.1.2 Site Assessment

The CAI at CAU 383 involved walk-over and drive-over radiological surveys, soil sampling with a roto-sonic drill rig, and soil sampling with hand tools. The investigation results identified both chemical and radiological COCs that exceeded the PALs as defined in the CAIP (DTRA, 2003) in all of the CASs and areas that were characterized. The maximum concentration of the COCs identified at each site and their corresponding PALs are presented in [Tables D.1-1](#) (chemical results) and [D.1-2](#) (radiological results).

Table D.1-1
Maximum Reported Chemical Values for Tier 1 Comparison
(Page 1 of 6)

Contaminant of Concern	CAS Number	Sample Number	Results (mg/kg)	PAL ¹ (mg/kg)
Muckpile Muck				
Arsenic	7440-38-2	383MH0353.5	6	23
Barium	7740-39-3	383MB0600.5	7,000	67,000
Beryllium	7440-41-7	383MB1200.5	2.4	1,900
Cadmium	7440-43-9	383MB0400.5	15	450
Chromium	7440-47-3	383MB0200.5	33	450
Lead	7439-92-1	383MB0912.5	120	800
Selenium	7782-49-2	383MB0559.5	0.99	310
Silver	7440-22-4	383MH2A37.5	1.1	5,100
Mercury	7439-97-6	383MH0353.5	0.51	5,100
Diesel-Range Organics ²	68334-30-5	383MB0800.5	300	100
1,2,4-Trimethylbenzene	95-63-6	383MB0800.5	0.0072	170
1,3,5-Trimethylbenzene	108-67-8	383MB0800.5	0.0072	70
Acetone	67-64-1	383MH0723.5	0.01	54,000
Ethylbenzene	100-41-4	383MB0800.5	0.12	400
M+P-Xylene	136777-61-2	383MB0800.5	1.5	420
Methylene Chloride	75-09-2	383MB0586.0	0.0013	21
O-Xylene	95-47-6	383MB0800.5	1	420
Acenaphthene	83-32-9	383MB1000.5	0.022	29,000
Anthracene	120-12-7	383MB1000.5	0.17	100,000
Benzo(A)Anthracene	56-55-3	383MB1000.5	1.2	2.1
Benzo(A)Pyrene	50-32-8	383MB1000.5	1.3	0.21
Benzo(B)Fluoranthene	205-99-2	383MB1000.5	1.7	2.1
Benzo(K)Fluoranthene	207-08-9	383MB1000.5	0.65	21
Bis(2-Ethylhexyl)Phthalate	117-81-7	383MH2A08.0	0.17	120
Butyl Benzyl Phthalate	85-68-7	383MH1100.5	0.035	100,000
Carbazole	86-74-8	383MB1000.5	0.057	86
Chrysene	218-01-9	383MB1000.5	1	210
Dibenzofuran	132-64-9	383MB1000.5	0.065	1,600
Fluoranthene	206-44-0	383MB1000.5	1.5	22,000

Table D.1-1
Maximum Reported Chemical Values for Tier 1 Comparison
(Page 2 of 6)

Contaminant of Concern	CAS Number	Sample Number	Results (mg/kg)	PAL ¹ (mg/kg)
Muckpile Native				
Fluorene	86-73-7	383MB1000.5	0.016	26,000
Ideno(1,2,3-Cd)Pyrene	193-39-5	383MB1000.5	0.63	2.1
Naphthalene	91-20-3	383MB1000.5	0.019	190
Pyrene	129-00-0	383MB1000.5	1.6	29,000
Arsenic	7440-38-2	383MH0922.5	3.8	23
Barium	7740-39-3	383MH0600.5	370	67,000
Beryllium	7440-41-7	383MH0922.5	1	1,900
Cadmium	7440-43-9	383MH122.5	1	450
Chromium	7440-47-3	383MH1391.0	5.8	450
Lead	7439-92-1	383MH1734.5	160	800
Selenium	7782-49-2	383MH1503.5	0.29	310
Silver	7440-22-4	383MH1734.5	2.8	5,100
Mercury	7439-97-6	383MH1734.5	0.33	5,100
Diesel-Range Organics ²	68334-30-5	383MH0600.5	700	100
Acetone	67-64-1	383MH1422.0	0.018	54,000
Hexachlorobutadiene	87-68-3	383MH1503.5	0.0015	22
Methylene Chloride	75-09-2	383MH1503.5	0.0016	21
Benzo(A)Anthracene	56-55-3	383MB0305.5	0.022	2.1
Benzo(A)Pyrene	50-32-8	383MB0305.5	0.016	0.21
Benzo(B)Fluoranthene	205-99-2	383MB0305.5	0.028	2.1
Bis(2-Ethylhexyl)Phthalate	117-81-7	383MB1425.5	0.22	120
Chrysene	218-01-9	383MB0305.5	0.023	210
Fluoranthene	206-44-0	383MB0305.5	0.023	22,000
Pond Sediment				
Arsenic	7440-38-2	383PH0101.0	14	23
Barium	7740-39-3	383PH0101.0	6,300	67,000
Beryllium	7440-41-7	383PH0306.5	2	1,900
Cadmium	7440-43-9	383PH0300.5	0.34	450
Chromium	7440-47-3	383PH0101.0	12	450

Table D.1-1
Maximum Reported Chemical Values for Tier 1 Comparison
(Page 3 of 6)

Contaminant of Concern	CAS Number	Sample Number	Results (mg/kg)	PAL ¹ (mg/kg)
Lead	7439-92-1	383PB0300.5	38	800
Silver	7440-22-4	383PB0102.0	0.077	5,100
Mercury	7439-97-6	383PB0300.5	0.048	5,100
Diesel-Range Organics ²	68334-30-5	383PH0216.0	330	100
Acetone	67-64-1	383PH0101.0	0.014	54,000
Ethylbenzene	100-41-4	383PB0400.5	0.0016	400
M+P-Xylene	136777-61-2	383PB0400.5	0.0083	420
O-Xylene	95-47-6	383PB0400.5	0.0033	420
Benzo(A)Anthracene	56-55-3	383PH0216.0	0.026	2.1
Benzo(A)Pyrene	50-32-8	383PH0216.0	0.028	0.21
Benzo(B)Fluoranthene	205-99-2	383PH0216.0	0.059	2.1
Benzo(K)Fluoranthene	207-08-9	383PH0216.0	0.031	21
Bis(2-Ethylhexyl)Phthalate	117-81-7	383PH0216.0	0.33	120
Chrysene	218-01-9	383PH0216.0	0.066	210
Fluoranthene	206-44-0	383PH0216.0	0.031	22,000
Pyrene	129-00-0	383PH0216.0	0.063	29,000
Pond Native				
Arsenic	7440-38-2	383PB0104.5	2.9	23
Barium	7740-39-3	383PH0217.5	3,200	67,000
Beryllium	7440-41-7	383PH0320.5	1	1,900
Cadmium	7440-43-9	383PB0104.5	0.17	450
Chromium	7440-47-3	383PH0320.5	3.4	450
Lead	7439-92-1	383PH0217.5	12	800
Silver	7440-22-4	383PH0217.5	0.48	5,100
Mercury	7439-97-6	383PH0320.5	0.12	5,100
Acetone	67-64-1	383PH0217.5	0.025	54,000
Hexachlorobutadiene	87-68-3	383PH0418.5	0.0017	22

Table D.1-1
Maximum Reported Chemical Values for Tier 1 Comparison
(Page 4 of 6)

Contaminant of Concern	CAS Number	Sample Number	Results (mg/kg)	PAL ¹ (mg/kg)
Oil Spill				
Arsenic	7440-38-2	383OB0800.5	7.1	23
Barium	7740-39-3	383OB0400.5	300	67,000
Beryllium	7440-41-7	383OB0500.5	1.2	1,900
Cadmium	7440-43-9	383OB0200.5	1.4	450
Chromium	7440-47-3	383OB0700.5	10	450
Lead	7439-92-1	383OB0700.5	31	800
Selenium	7782-49-2	383OB0800.5	1.2	310
Diesel-Range Organics ²	68334-30-5	383OB0100.5	3,400	100
Acetone	67-64-1	383OB0100.5	0.072	54,000
Acenaphthene	83-32-9	383OB0800.5	0.093	29,000
Anthracene	120-12-7	383OB0800.5	0.47	100,000
Benzo(A)Anthracene	56-55-3	383OB0800.5	17	2.1
Benzo(A)Pyrene	50-32-8	383OB0800.5	20	0.21
Benzo(B)Fluoranthene	205-99-2	383OB0800.5	37	2.1
Benzo(K)Fluoranthene	207-08-9	383OB0800.5	10	21
Bis(2-Ethylhexyl)Phthalate	117-81-7	383OB0800.5	4	120
2-Butanone	78-93-3	383OB0100.5	0.017	110,000
Carbazole	86-74-8	383OB0800.5	0.79	86
Chrysene	218-01-9	383OB0800.5	21	210
Dibenzo(A,H)Anthracene	53-70-3	383OB0800.5	10	0.21
Fluoranthene	206-44-0	383OB0800.5	10	22,000
Fluorene	86-73-7	383OB0800.5	0.068	26,000
Ideno(1,2,3-Cd)Pyrene	193-39-5	383OB0800.5	22	2.1
Naphthalene	91-20-3	383OB0800.5	0.056	190
Pyrene	129-00-0	383OB0800.5	89	29,000
Radioactive Material				
Arsenic	7440-38-2	383RB0200.5	7.1	23
Barium	7740-39-3	383RB0300.5	260	67,000
Beryllium	7440-41-7	383RB0100.5	1.7	1,900
Cadmium	7440-43-9	383RB0300.5	0.57	450

Table D.1-1
Maximum Reported Chemical Values for Tier 1 Comparison
(Page 5 of 6)

Contaminant of Concern	CAS Number	Sample Number	Results (mg/kg)	PAL ¹ (mg/kg)
Lead	7439-92-1	383RB0300.5	61	800
Mercury	7439-97-6	383RB0100.5	0.16	5,100
Diesel-Range Organics ²	68334-30-5	383RB0400.5	15	100
Benzo(A)Anthracene	56-55-3	383RB0300.5	0.17	2.1
Benzo(A)Pyrene	50-32-8	383RB0400.5	0.23	0.21
Benzo(B)Fluoranthene	205-99-2	383RB0400.5	0.62	2.1
Benzo(K)Fluoranthene	207-08-9	383RB0300.5	0.23	21
Bis(2-Ethylhexyl)Phthalate	117-81-7	383RB0300.5	1.2	120
Butyl Benzyl Phthalate	85-68-7	383RB0100.5	0.78	100,000
Carbazole	86-74-8	383RB0400.5	0.023	86
Chrysene	218-01-9	383RB0400.5	0.48	210
Dibenzo(A,H)Anthracene	53-70-3	383RB0400.5	0.027	21
Di-N-Butyl-Phthalate	84-74-2	383RB0100.5	4.5	62,000
Fluoranthene	206-44-0	383RB0400.5	0.51	22,000
Ideno(1,2,3-Cd)Pyrene	193-39-5	383RB0400.5	0.08	2.1
Naphthalene	91-20-3	383RB0400.5	0.018	190
Pyrene	129-00-0	383RB0400.5	0.43	29,000
Drainage				
Arsenic	7440-38-2	383DH3100.5	5.3	23
Barium	7740-39-3	383DH3200.5	6,600	67,000
Beryllium	7440-41-7	383DH1400.5	2.1	1,900
Chromium	7440-47-3	383DH3200.5	9.2	450
Lead	7439-92-1	383DH0900.5	52	800
Mercury	7439-97-6	383DH1400.5	0.083	5,100
Diesel-Range Organics ²	68334-30-5	383DH3500.5	68	100
Acetone	67-64-1	383DH0200.5	0.039	54,000
2-Butanone	78-93-3	383DH0200.5	0.01	110,000
Ethylbenzene	100-41-4	383DH0300.5	0.011	400
Hexachlorobutadiene	87-68-3	383DH2700.5	0.0016	22
M+P-Xylene	136777-61-2	383DH0300.5	0.057	420

Table D.1-1
Maximum Reported Chemical Values for Tier 1 Comparison
(Page 6 of 6)

Contaminant of Concern	CAS Number	Sample Number	Results (mg/kg)	PAL ¹ (mg/kg)
Methylene Chloride	75-09-2	383DH0200.5	0.004	21
O-Xylene	95-47-6	383DH0300.5	0.023	420
Styrene	100-42-5	383DH0300.5	0.0036	1,700
Toluene	108-88-3	383DH0500.5	0.0016	520
Benzo(A)Anthracene	56-55-3	383DH2600.5	0.066	2.1
Benzo(A)Pyrene	50-32-8	383DH2600.5	0.064	0.21
Benzo(B)Fluoranthene	205-99-2	383DH2600.5	0.062	2.1
Benzo(K)Fluoranthene	207-08-9	383DH2600.5	0.057	21
Bis(2-Ethylhexyl)Phthalate	117-81-7	383DH2200.5	2.4	120
Butyl Benzyl Phthalate	85-68-7	383DH0500.5	0.04	100,000
Chrysene	218-01-9	383DH2200.5	0.1	210
Dimethyl Phthalate	131-11-3	383DH2200.5	0.014	100,000
Di-N-Octyl Phthalate	117-84-0	383DH2200.5	0.059	25,000
Fluoranthene	206-44-0	383DH2600.5	0.12	22,000
Pyrene	129-00-0	383DH2600.5	0.19	29,000

RR1 - Indicates the sample was reanalyzed at a higher dilution due to higher-than-expected results.

¹PALs (as per the CAU 383 CAIP)

²Diesel-range organics (i.e., petroleum hydrocarbons) level is defined by NAC 445.2272 (NAC, 2005b).

Table D.1-2
Maximum Reported Radiological Values for Tier 1 Comparison
(Page 1 of 4)

Contaminant of Concern	CAS Number	Sample Number	Results (pCi/g)	PAL ¹ (pCi/g)
Muckpile Muck				
Actinium-228	14331-83-0	383MB0400.5	2.89	5
Americium-241	14596-10-2	383MB0543.5	28.8	7.62
Bismuth-214	14733-03-0	383MB0900.5	2.08	5
Cesium-137	10045-97-3	383MB0543.5	1,060	7.3
Europium-152	14683-23-9	383MB0543.5	2.64	5.7

Table D.1-2
Maximum Reported Radiological Values for Tier 1 Comparison
(Page 2 of 4)

Contaminant of Concern	CAS Number	Sample Number	Results (pCi/g)	PAL ¹ (pCi/g)
Lead-212	15092-94-1	383MB0900.5	3.37	5
Lead-214	15067-28-4	383MB0900.5	2.08	5
Thallium-208	14913-50-9	383MB0900.5	1.02	5
Strontium-90	10098-97-2	383MH0559.5	54	503
Plutonium-238	13981-16-3	383MB0543.5	15.6	7.78
Plutonium-239	15117-48-3	383MB0543.5	84	7.62
Muckpile Native				
Actinium-228	14331-83-0	383MH0922.5	2.14	5
Americium-241	14596-10-2	383MH2A45.0	1.1	7.62
Bismuth-214	14733-03-0	383MH0922.5	0.92	5
Cesium-137	10045-97-3	383MH2A45.0	9.8	7.3
Europium-155	14391-16-3	383MH0922.5	0.32	1.35
Lead-212	15092-94-1	383MH0922.5	2.27	5
Lead-214	15067-28-4	383MB1425.5	0.91	5
Thorium-234	15065-10-8	383MH0922.5	1.8	5
Thallium-208	14913-50-9	383MH0922.5	0.76	5
Strontium-90	10098-97-2	383MB1425.5	0.33	503
Plutonium-238	13981-16-3	383MH2A45.0	0.213	7.78
Plutonium-239	15117-48-3	383MH2A45.0	4.55	7.62
Pond Sediment				
Actinium-228	14331-83-0	383PH0216.0	2.31	5
Bismuth-214	14733-03-0	383PH0306.5	1.72	5
Cesium-137	10045-97-3	383PH0216.0	142	7.3
Lead-212	15092-94-1	383PH0216.0	2.73	5
Lead-214	15067-28-4	383PH0306.5	1.74	5
Thallium-208	14913-50-9	383PH0408.0	0.8	5

Table D.1-2
Maximum Reported Radiological Values for Tier 1 Comparison
(Page 3 of 4)

Contaminant of Concern	CAS Number	Sample Number	Results (pCi/g)	PAL ¹ (pCi/g)
Strontium-90	10098-97-2	383PH0300.5	3.58	503
Plutonium-238	13981-16-3	383PH0216.0	0.74	7.78
Plutonium-239	15117-48-3	383PH0101.0	0.305	7.62
Pond Native				
Actinium-228	14331-83-0	383PH0116.5	2.4	5
Bismuth-214	14733-03-0	383PH0217.5	1.49	5
Cesium-137	10045-97-3	383PH0217.5	4.34	7.3
Lead-212	15092-94-1	383PH0320.5	2.76	5
Lead-214	15067-28-4	383PH0116.5	1.81	5
Thallium-208	14913-50-9	383PH0116.5	1.05	5
Plutonium-239	15117-48-3	383PH0217.5	0.154	7.62
Drainage				
Actinium-228	14331-83-0	383DH0200.5	2.26	5
Aluminum-26	14682-66-7	383DH1600.5	0.105	2.32
Americium-241	14596-10-2	383DH0200.5	1.88	7.62
Bismuth-214	14733-03-0	383DH1400.5	1.48	5
Cesium-137	10045-97-3	383DH2100.5	78.1	7.3
Lead-212	15092-94-1	383DH0600.5	2.54	5
Lead-214	15067-28-4	383DH1400.5	1.68	5
Thorium-234	15065-10-8	383DH0500.5	2.4	5
Thallium-208	14913-50-9	383DH1400.5	0.87	5
Strontium-90	10098-97-2	383DH0100.5	1.88	503
Plutonium-238	13981-16-3	383DH0100.5	0.73	7.78
Plutonium-239	15117-48-3	383DH1400.5	4.21	7.62
Oil Spill				
Actinium-228	14331-83-0	383OB0100.5	2.21	5
Bismuth-214	14733-03-0	383OB0800.5	1.1	5
Cesium-137	10045-97-3	383OB0700.5	20.5	7.3

Table D.1-2
Maximum Reported Radiological Values for Tier 1 Comparison
(Page 4 of 4)

Contaminant of Concern	CAS Number	Sample Number	Results (pCi/g)	PAL ¹ (pCi/g)
Radioactive Material				
Lead-212	15092-94-1	383OB0500.5	3.1	5
Lead-214	15067-28-4	383OB0600.5	1.06	5
Thallium-208	14913-50-9	383OB0500.5	0.97	5
Plutonium-239	15117-48-3	383OB0800.5	1.04	7.62
Actinium-228	14331-83-0	383RB0100.5	2.9	5
Bismuth-212	14913-49-6	383RB0100.5	3.2	5
Bismuth-214	14733-03-0	383RB0200.5	1.12	5
Cesium-137	10045-97-3	383RB0100.5	114	7.3
Lead-212	15092-94-1	383RB0100.5	2.96	5
Lead-214	15067-28-4	383RB0400.5	1.04	5
Thorium-227	15065-47-9	383RB0100.5	4.1	5
Thorium-234	15065-10-8	383RB0100.5	7.2	5
Thallium-208	14913-50-9	383RB0100.5	0.85	5
Plutonium-238	13981-16-3	383RB0400.5	0.232	7.78
Plutonium-239	15117-48-3	383RB0200.5	2.09	7.62

¹ PALs used as action levels (The PALs for radiological contaminants are based on background or the National Council of Radiation Protection and Measurement (NCRP) Report No. 129 recommended screening limits for construction, commercial, and industrial land use scenario (NCRP, 1999) scaled from 25- to 15-millirem-per-year dose and the generic guidelines for residual concentration of radionuclides in DOE Order 5400.5 (DOE, 1993).

D.1.3 Site Classification and Initial Response Action

The four major site classifications listed in Table 3 of the ASTM standard are: (1) immediate threat to human health, safety, and/or the environment; (2) short-term (0 to 2 years) threat to human health, safety, and/or the environment; (3) long-term (greater than 2 years) threat to human health, safety, and/or the environment; (4) no demonstrated long-term threats (ASTM, 1995).

Based on the CAI, none of the CASs or associated areas present a threat to human health, safety, and/or the environment; therefore, no interim response actions are necessary at these sites. The CAI demonstrated that the contamination present at CAU 383 is limited to the points of release: the Muckpile, the ponds, the drainage, and the compressor/blower pad. The results further showed that there has been no migration into the subsurface and only minor downgradient

migration in storm runoff. The storm runoff is constrained by the drainage and the ponds. Analytical results from the native material show only a single instance of radiological contamination in the underlying native material. The sample from the muck 7 ft above the native sample contained the same contaminants at a higher concentration, and there was drill refusal 1.5 ft below the contact so it was not possible to get a sample that was not impacted by the muck. Based on this evidence, the contamination in the native material is most likely the result of slough in the borehole and not migration of contaminants from the muck to the native material. A detailed discussion of the nature and extent of contamination is presented in Appendix A of this report. Based on this information, these sites are determined to be Classification 3 as defined by ASTM Method E 1739-95. At all of the sites, COCs were identified that may pose long-term threats to human health or the environment.

D.1.4 Development of Tier 1 Look-Up Table of Risk-Based Screening Level Selection

Tier 1 action levels have been defined as the PALs established during the DQO process. The PALs are a tabulation of chemical-specific (but not site-specific) screening levels based on the type of media (soil) and potential exposure scenarios (industrial). These are very conservative estimates of risk, are preliminary in nature, and are used as action levels for site screening purposes. Although the PALs are not intended to be used as FALs, a FAL may be defined as the Tier 1 action level (i.e., PAL) if individual constituent analytical results are below the corresponding Tier 1 action level. The FAL may also be established as the Tier I action level if individual constituent analytical results exceed the corresponding Tier 1 action level value and implementation of a corrective action based on the final action level is practical. The PALs are defined as:

- The EPA Region 9 Risk-Based PRGs for Industrial Soils (2002).
- Background concentrations for RCRA metals will be evaluated when natural background exceeds the PAL, as is often the case with arsenic. Background is considered to be the mean plus two times the standard deviation of the mean based on data published in Mineral and Energy Resource Assessment of the Nellis Air Force Range (NBMG, 1998; Moore, 1999).
- Concentrations for TPH-DRO above 100 mg/kg per NAC 445A.2272 (NAC, 2005b).

- For COPCs without established PRGs, a protocol similar to EPA Region 9 will be used to establish an action level; otherwise, an established PRG from another EPA region may be chosen.
- When the CAIP was written, the PALs for radionuclides were isotope-specific and defined as the higher of the maximum concentration for that isotope found in samples from undisturbed background locations in the vicinity of the Nevada Test Site (McArthur and Miller, 1989; US Ecology and Atlan-Tech, 1992; Black and Townsend, 1996), from any of the three background samples collected during the investigation, or as specified in the *Nevada Test Site Performance Objective for Certification of Nonradioactive Hazardous Waste (BN, 1995)*.

Since the corrective action was completed, the radiological PALs have been changed through agreement with NDEP as follows: The PALs for radioactive contaminants are based on the NCRP Report No. 129 recommended screening limits for construction, commercial, and industrial land-use scenarios (NCRP, 1999) scaled to 25 millirem per year dose constraint (Appenzeller-Wing, 2004) and the generic guidelines for residual concentration of radionuclides in DOE Order 5400.5 (DOE, 1993).

The PALs were developed based on an industrial scenario. Because CAU 383 in Area 12 is not assigned any work stations and is considered to be in remote or occasional use areas, the use of industrial-land-use-based PALs is conservative. The Tier 1 look-up table is defined as the PAL concentrations or activities defined in the CAIP.

D.1.5 Exposure Pathway Evaluation

The DQOs stated that site workers would only be exposed to COCs through oral ingestion, inhalation, or dermal contact (absorption) due to exposure to potentially contaminated media (i.e., soil) at the CASSs. The results of the CAI showed that all COCs identified in CAU 383 are localized near the release points and have not migrated laterally or vertically. Because the contaminants were only identified in the soil of the Muckpile, the pad, and the drainage and the sediments in the ponds, the only potential exposure pathway would be through worker contact with the contaminated soil. The lack of migration demonstrated by the analytical results, elapsed time since the suspected release, and the depth to groundwater supports the selection and evaluation of only the surface and shallow subsurface contact as the complete exposure pathway. Groundwater is not considered to be an exposure mechanisms or pathway.

D.1.6 Comparison of Site Conditions with Tier 1 Risk-Based Screening Levels

All analytical results for CAU 383 were less than corresponding Tier 1 action levels (i.e., PALs) except for those listed in [Table D.1-3](#).

Table D.1-3
COPCs Detected Above Preliminary Action Levels

	TPH-DRO	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Dibenzo(a,h)anthracene	Ideno(1,2,3-cd)pyrene	Am-241	Cs-137	Sr-90	Pu-238	Pu-239
CAS 12-06-06 Muckpile Muck	X							X	X	X	X	X
CAS 12-06-06 Muckpile Native	X								X			
Drainage									X			
Pond Sediment	X								X			
CAS 12-25-02 Oil Spill	X	X	X	X	X	X	X		X			
CAS 12-28-02 Radioactive Material			X						X			

D.1.7 Evaluation of Tier 1 Results

For all constituents at CAU 383 not listed in [Section D.1.6](#), the FALs were established as the Tier 1 risk-based screening levels. It was determined that no further action is required for these constituents at CAU 383.

It was determined by DTRA and NNSA/NSO that remediation of the remaining constituents listed in [Table D.1-3](#) is not practical. Therefore, a Tier 2 SSTLs will be calculated for those constituents at each CAS.

D.1.8 Tier 1 Remedial Action Evaluation

TPH-DRO Evaluation

Remediation to Tier 1 action levels would be difficult and expensive while potentially not providing a significant risk reduction. It would also present an increased risk to workers operating heavy equipment on the Muckpile. Therefore, it was determined to assess the risk to human health posed by the hazardous constituents of TPH-DRO at CAU 383 under a Tier 2 evaluation before establishing FALs for TPH-DRO constituents or implementing a corrective action.

Chemical Evaluation

Remediation to Tier 1 action levels for benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, and ideno(1,2,3-cd)pyrene would be difficult and expensive while potentially not providing a significant risk reduction. Therefore, the risk to human health posed by the chemicals that exceeded the Tier 1 action levels at CAU 383 needs to be assessed under a Tier 2 evaluation before establishing FALs for these chemicals or implementing a corrective action.

Radionuclide Evaluation

Actions to remediate Am-241, Cs-137, Pu-238, and Pu-239 to Tier 1 action levels would be difficult, expensive, and increase the risk to site workers while potentially not providing a significant risk reduction. Therefore, these radionuclides were moved to a Tier 2 evaluation before establishing FALs or implementing a corrective action.

D.1.9 Tier 2 Evaluation

No additional data were needed to complete a Tier 2 evaluation.

D.1.10 Development of Tier 2 Table of SSTLs

Evaluation of TPH-DRO SSTLs

The ASTM Method E 1739-95 stipulates that risk evaluations for TPH-DRO contamination be calculated and evaluated based on the risk posed by the potentially hazardous constituents of TPH-DRO (ASTM, 1999). Section 6.4.3, "Use of Total Petroleum Hydrocarbon Measurements," of ASTM Method E 1739-95 states: "TPH-d should not be used for risk assessment because the general measure of TPH-d provides insufficient information about the amounts of individual chemical(s) of concern present" (see also Sections X1.5.4 and X1.42 of

Method E 1739-95). Therefore, the individual potentially hazardous constituents in TPH-DRO were compared to corresponding Tier 2 SSTLs to evaluate the need for corrective action at CAU 383. Although Tier 2 SSTLs are generally calculated using site-specific inputs and general risk formulas, the Tier 2 SSTLs selected for the hazardous constituents of TPH-DRO (except for benzo(a)anthracene) are the EPA Region 9 PRGs (EPA, 2002). These SSTLs and the maximum reported level for each diesel constituent per CAS are presented in Table D.1-4. For an explanation of the benzo(a)anthracene SSTL, see the following text.

Table D.1-4
Tier 2 SSTLs and CAU 383 Results for Hazardous Constituents of Diesel

CAS No.	Common Name	SSTL (mg/kg)	Maximum Reported Value (mg/kg)		
			12-06-06 ¹	12-25-02	12-28-02
108-67-8	1,3,5-Trimethylbenzene	687	0.0072	ND	ND
91-57-6	2-Methylnaphthalene	175,000	ND	ND	ND
56-55-3	Benzo(a)anthracene	147 ²	1.2	18	0.17
71-43-2	Benzene	122	ND	ND	ND
50-32-8	Benzo(a)pyrene	15	1.3	23	0.23
100-41-4	Ethylbenzene	1,210	0.12	ND	ND
91-20-3	Naphthalene	2,300	0.019	0.056	0.018
108-88-3	Toluene	40,200	ND	ND	ND
1330-20-7	Total Xylene	9,900	2.5	ND	ND
104-51-8	N-Butylbenzene	240	ND	ND	ND
103-65-1	N-Propylbenzene	240	ND	ND	ND

¹Includes the drainage and ponds

²SSTL calculated as described in the Evaluation of Chemical SSTLs Section.

Evaluation of Chemical SSTLs

The Tier 2 evaluation consisted of calculating Tier 2 SSTLs using site-specific inputs to standard risk equations for chemical contaminants. The SSTLs were calculated using equations which are compliant with the *Risk Assessment Guidance for Superfund* Part B procedures and were extracted from the *Risk Assessment Information System* (ORNL, 2004) located online at: http://risk.lsd.ornl.gov/cgi-bin/prg/PRG_search. This website provides an online menu-driven environmental risk assessment system that among other things will calculate PRGs based on

site-specific parameters. The calculated SSTLs and the maximum reported level for each chemical constituent per CAS are presented in [Table D.1-5](#). The CAS-specific FALs established for these chemical constituents are the SSTLs listed in [Table D.1-5](#).

Table D.1-5
Tier 2 SSTLs and CAU 383 Results for Chemical Constituents

CAS No.	Common Name	SSTL (mg/kg)	Maximum Reported Value (mg/kg)		
			12-06-06 ¹	12-25-02	12-28-02
56-55-3	Benzo(a)anthracene	147 ²	1.2	18	0.17
50-32-8	Benzo(a)pyrene	15	1.3	23	0.23
205-99-2	Benzo(B)fluoranthene	150	1.7	43	0.62
207-08-9	Benzo(K)fluoranthene	1,500	0.65	19	0.23
53-70-3	Dibenzo(a,h)anthracene	15	ND	10	0.027
193-39-5	Ideno(1,2,3-Cd)pyrene	150	0.63	22	0.08

¹ Includes the drainage and ponds

² SSTL calculated under the Occasional Use scenario as described in the Evaluation of Chemical SSTLs Section.

The site-specific input parameters used for this calculation were the “NTS standard” parameter values listed in [Table D.1-6](#) for the Occasional Use Area exposure scenario. The Occasional Use Area scenario addresses exposure to industrial workers exposed daily to contaminants in soil during an average work day. This scenario assumes that this is only an occasional work area for the worker who will be on the site for a very limited time during his career (10 days per year, 8 hours per day, for 5 years). The criteria for this scenario are that there are no active powered buildings with toilets present at the site for the shelter and comfort of the worker. The worker exposures are limited to working hours and do not include contributions from ingestion of drinking water, plant foods, meat, or fish taken from the immediate area.

Table D.1-6
Specific Input Parameters with Proposed NTS Standard Values

Parameter	Definition	Units	EPA Region 9 Default Value	Exposure Scenario		
				Industrial Area	Remote Work Area	Occasional Use Area
ED	Exposure duration	yr	25	25	25	5 ^a
EF	Exposure frequency	day/yr	250	250	42 ^b	10 ^c
IR	Soil ingestion rate	kg/day	0.0001	0.00005 ^a	0.00005 ^d	0.00005 ^d
foc	Fraction of organic carbon in soil	g/g	0.006	0.001 ^b	0.001 ^b	0.001 ^b
? _w	Water-filled soil porosity	cm ³ /cm ³	0.15	0.1 ^c	0.1 ^c	0.1 ^c
V	Fraction of vegetative cover	unitless	0.5	0.1 ^d	0.1 ^d	0.1 ^d
TR	Target excess individual lifetime cancer risk	unitless	1E-06	1E-06	1E-05	1E-05

Rational for non-default input values:

^aEPA *Exposure Factors Handbook* (EPA/600/P-95/002Fa) (EPA, 1997)

^bEstimated value based on reduced total organic carbon content of NTS soils

^cEstimated value based on reduced soil moisture content of NTS soils

^dEstimated value based on reduced vegetative cover at NTS

cm³/cm³ = Cubic centimeters per cubic centimeter

day/yr = Days per year

g/g = Grams per gram

kg/day = Kilograms per day

yr = Year

Evaluation of Radiological Constituent SSTLs

The Tier 2 evaluation consisted of evaluating the mixture of all radionuclides detected at each CAS to develop Tier 2 action levels for the radionuclides that exceeded Tier 1 levels. The CAS specific Tier 2 action levels were calculated using the RESRAD code (version 6.22) and site-specific parameters. The RESRAD calculations were based on continued use of the site under the Occasional Use Area scenario, assuming that a site worker will be on site for 10 days per year, 8 hours a day for 5 years. A more detailed discussion of the RESRAD code, site-specific parameters used, and the printed RESRAD outputs is provided in [Attachment A](#) of this Appendix. These SSTLs and the maximum reported level for each radiological constituent per CAS are presented in [Table D.1-7](#).

**Table D.1-7
Tier 2 SSTLs and CAU 383 Results for Radiological Constituents**

Common Name	12-06-06 ¹ (pCi/g)			12-25-02 (pCi/g)			12-28-02 (pCi/g)		
	SSTL	Maximum Result	Site Average	SSTL	Maximum Result	Site Average	SSTL	Maximum Result	Site Average
Americium-241	7.32	28.8	1.03	N/A	ND	N/A	N/A	ND	N/A
Cesium-137	269.56	1,060	35.72	275	20.5	6.98	275.2	114	38
Plutonium-238	3.97	15.6	0.44	N/A	ND	N/A	2370	0.232	0.116
Plutonium-239	21.36	84	3.04	215	1.04	0.257	2152	2.09	1.064

¹Includes the drainage and ponds

Although all detected radionuclides at a CAS are used in the sum-of-fractions calculation and a unique Tier 2 action level is developed for all radionuclides, only the five radionuclides that initially exceeded Tier 1 levels have a Tier 2-based FAL. The CAS-specific FALs established for these radionuclides are the SSTLs listed in [Table D.1-7](#).

D.1.11 Comparison of Site Conditions with Tier 2 FALs

The Tier 2 action levels are typically compared to individual sample results from reasonable points of exposure (as opposed to the source areas as is done in Tier 1) on a point-by-point basis. Points of exposure are defined as those locations or areas at which an individual or population may come in contact with a COC originating from a CAS. For CAU 383, the Tier 2 action levels were compared to maximum constituent concentrations from each sample location and to the average concentration for the entire site.

A comparison of the maximum concentration of the hazardous constituents of TPH-DRO and the chemical constituents identified above the Tier 1 action levels was conducted against the CAS-specific Tier 2 FALs as shown on [Tables D.1-4](#) and [D.1-5](#). All analytical results for potentially hazardous constituents in TPH-DRO were below the FALs for all three CASs, the drainage, and the ponds. All of the chemical constituents were below the CAS-specific FALs in the Muckpile (CAS 12-06-06 including the drainage and ponds) and the Radioactive Material (CAS 12-28-02). All of the chemical constituents were below the CAS-specific FALs in the Oil Spill (CAS 12-25-02) except for benzo(a)pyrene.

A comparison between the maximum concentration of the radionuclides identified above Tier 1 action levels (Am-241, Cs-137, Pu-238, and Pu-239) was conducted against the CAS-specific Tier 2-based FALs listed in [Table D.1-7](#). All four isotopes are above Tier 2-based FALs in the Muckpile (CAS 12-06-06) but not in the drainage or the ponds. None of the isotopes exceed the CAS-specific FALs for the Oil Spill (CAS 12-25-02) or the Radioactive Material (12-28-02).

D.1.12 Tier 2 Remedial Action Evaluation

Based on the Tier 2 evaluation of the TPH-DRO hazardous constituents, the chemical constituents, and the radiological constituents, CAS 12-06-06 is contaminated with radiological constituents and CAS 12-25-02 is contaminated with benzo(a)pyrene. These CASs pose an unacceptable risk. Corrective Action Site 12-28-02, the drainage, and the ponds do not have radiological or chemical concentrations above the FALs; therefore, they are not considered to be contaminated. Therefore, the close in place corrective action with use restrictions is recommended for CAU 383.

As all contaminant FALs were established as Tier 1 or Tier 2 action levels, a Tier 3 evaluation was considered unnecessary.

D.2.0 Regulatory Basis

The FFACO Part III, Section III.3 (FFACO, 1996) stipulates conformance with Chapter 445 of the NAC (NAC, 2005a). Section NAC 445A.227 lists the factors to be considered in determining whether corrective action is required.

Section NAC 445A.227 states:

1. Except as otherwise provided in NAC 445A.22715, the Director may require an owner or operator to take corrective action if the release of a hazardous substance, hazardous waste, or a regulated substance contaminates soil and the level of contamination exceeds the action level established for the soil pursuant to NAC 445A.2272.
2. In determining whether corrective action is required, the Director shall consider:
 - (a) The depth of any groundwater
 - (b) The distance to irrigation wells or wells for drinking water.
 - (c) The type of soil that is contaminated.
 - (d) The annual precipitation.
 - (e) The type of waste or substance that was released.
 - (f) The extent of the contamination.
 - (g) The present and potential use for the land.
 - (h) The preferred routes of migration.
 - (i) The location of structures or impediments.
 - (j) The potential for a hazard related to fire, vapor, or explosion.
 - (k) Any other information specifically related to the site that the director determines is appropriate.

For a site where it is determined that corrective action is required (the corrective action process applies to all FFACO sites), Section NAC 445A.22705 (NAC, 2005c) stipulates a process to determine the necessary remediation standards (or FALs) based on an evaluation of the risk the site poses to public health and the environment.

Section NAC 445A.22705 states:

1. Except as otherwise provided in NAC 445A.22715, if an owner or operator is required to take corrective action pursuant to NAC 445A.227, the owner or operator may conduct an evaluation of the site, based on the risk it poses to public health and the environment, to determine the necessary remediation standards or to establish that corrective action is not necessary. Such an evaluation must be conducted using Method E 1739-95, adopted by the ASTM, as it exists on October 3, 1996, or an equivalent method approved by the Division.
2. The Division shall determine whether an evaluation complies with the requirements of Method E 1739-95, or an equivalent method of testing approved by the Division. The Division may reject, require revisions be made to, or withdraw its concurrence with the evaluation at any time after the completion of the evaluation for the following reasons:
 - (a) The evaluation does not comply with the applicable requirements for conducting the evaluation.
 - (b) Conditions at the site have changed.
 - (c) New information or previously unidentified information that would alter the results of the evaluation becomes available and demonstrates that the release may have a detrimental impact on public health or the environment.

Therefore, in compliance with Section NAC 445A.22705 (NAC, 2005c), NNSA/NSO will “conduct an evaluation of the site, based on the risk it poses to public health and the environment, to determine the necessary remediation standards or to establish that corrective action is not necessary” using ASTM Method E 1739-95.

D.3.0 Recommendations

Organic, inorganic, and radiological constituents detected in environmental samples during the CAI were evaluated against FALs to determine the nature and extent of COCs for CAU 383. Assessment of the data generated from investigation activities indicates that FALs were exceeded for radionuclides in three subsurface samples from three locations in CAS 12-06-06 and for benzo(a)pyrene in one surface sample in CAS 12-25-02.

As COCs were identified above corresponding FALs in CASs 12-06-06, 12-25-02, and CAS 12-28-02, it was determined through discussions with NDEP, DTRA, and NNSA/NSO that a closure in place with use restrictions is proposed for all of the CASs.

No further corrective action is necessary.

D.4.0 References

ASTM, see American Society for Testing and Materials.

American Society for Testing and Materials. 1995. *Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites/American Society for Testing and Materials*, ASTM E 1739-95 (Reapproved 2002). Philadelphia, PA.

Appenzeller-Wing, J., U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office. 2004. Letter to T.A. Maize (NDEP) entitled "Submittal of Proposed Radiological Preliminary Action Levels (PALs) for the Industrial Sites Project," 15 January. Las Vegas, NV.

BN, see Bechtel Nevada.

Bechtel Nevada. 1995. *Nevada Test Site Performance Objective for Certification of Nonradioactive Hazardous Waste*. G-E11/96.01, Rev. 0. Las Vegas, NV.

Black, S.C., and Y.E. Townsend. 1996. *U.S. Department of Energy, Nevada Operations Office Environmental Data Report for the Nevada Test Site - 1994*. Las Vegas, NV.

DOE, see U.S. Department of Energy.

DTRA, see Defense Threat Reduction Agency.

Defense Threat Reduction Agency. 2003. *Corrective Action Investigation Plan for Corrective Action Unit 383: Area 12 E-Tunnel Sites, Nevada Test Site*, Rev. 0. Prepared by SNJV. Las Vegas, NV.

EPA, see U.S. Environmental Protection Agency.

FFACO, see *Federal Facility Agreement and Consent Order*.

Federal Facility Agreement and Consent Order. 1996 (as amended). Agreed to by the State of Nevada, the U.S. Department of Energy, and the U.S. Department of Defense. Las Vegas, NV.

McArthur, R.D., and F.L. Miller, Jr. 1989. *Offsite Radiation Exposure Review Project, Phase II Soils Programs*, DOE/NV/10384-23. Las Vegas, NV: Desert Research Institute.

Moore, J., Science Applications International Corporation. 1999. Memorandum to M. Todd (SAIC) entitled, "Background Concentrations for NTS and TTR Soil Samples." Las Vegas, NV.

NAC, see *Nevada Administrative Code*.

NBMG, see Nevada Bureau of Mines and Geology.

NCRP, see National Council on Radiation Protection and Measurements.

National Council on Radiation Protection and Measurements. 1999. *Recommended Screening Limits for Contaminated Surface Soil and Review of Factors Relevant to Site-Specific Studies*, Report No. 129. Bethesda, MD.

Nevada Administrative Code. 2005a. NAC 445A, "Water Controls." Carson City, NV.

Nevada Administrative Code. 2005b. NAC 445A.2272, "Contamination of Soil: Establishment of Action Levels." Carson City, NV.

Nevada Administrative Code. 2005c. NAC 445A.22705, "Contamination of Soil: Evaluation of Site by Owner or Operator; Review of Evaluation by Division." Carson City, NV.

Nevada Bureau of Mines and Geology. 1998. *Mineral and Energy Resource Assessment of the Nellis Air Force Range, Clark, Lincoln, and Nye Counties, Nevada*, Open File Report 98-1. Reno, NV.

ORNL, see Oak Ridge National Laboratory.

Oak Ridge National Laboratory. 2004. *Risk Assessment Information System*. As accessed at http://risk.lsd.ornl.gov/cgi-bin/prg/PRG_search on 25 April 2006.

U.S. Department of Energy. 1993. DOE Order 5400.5 Change 2, "Radiation Protection of the Public and Environment." Washington, DC.

US Ecology and Atlan-Tech, Inc. 1991. *Environmental Monitoring Report for the Proposed Ward Valley, California, Low-Level Radioactive Waste (LLRW) Facility*, Vols. 1 and 2, Version 2. Rosewell, GA: California Department of Health, Environmental Management Branch.

U.S. Environmental Protection Agency. 1997. *Exposure Factors Handbook*, EPA/600/P-95/002Fa. Washington, DC: Office of Research and Development.

U.S. Environmental Protection Agency. 2002. *Region 9 Preliminary Remediation Goals (PRGs)*. San Francisco, CA.

Attachment A

RESRAD Report

Derivation of Residual Radioactive Material Guidelines for Radionuclides in Soil at
Corrective Action Unit (CAU) 383, Area 12 E-Tunnel Sites, Nevada Test Site, Nevada

May 2006

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Derivation of Residual Radioactive Material Guidelines for Radionuclides in Soil at Corrective Action Unit (CAU) 383, Area 12 E-Tunnel Sites, Nevada Test Site, Nevada

1.0 Introduction

The U.S. Department of Energy (DOE), the U.S. Department of Defense (DoD) (through the Defense Threat Reduction Agency [DTRA]), and the National Nuclear Security Administration Nevada Site Office (NNSA/NSO) Environmental Restoration Division have numerous sites impacted from the development, testing, and production of nuclear weapons. These impacts can take the form of chemical and/or radiological contaminants. Similar to its approach for chemical contamination, DoD and NNSA/NSO are committed to properly evaluating, radiologically characterizing, and where appropriate, remediating these sites to ensure the doses to radiation workers and members of the public are maintained as-low-as-reasonably achievable (ALARA), at a minimum, below the primary dose limits as stated in DOE Order 5400.5 (DOE, 1993).

To accomplish this, the potential for residual radioactive contamination in soils must be evaluated to determine the status of compliance with the requirements of DOE Order 5400.5 (DOE, 1993). The DOE Order 5400.5 requires that: “The Authorized Limits shall be established to (1) provide that, at a minimum, the basic dose limits ... will not be exceeded, or (2) be consistent with applicable generic guidelines.” Because generic guidelines have not been established for volumetric residual radioactivity for the radionuclides of concern at CAU 383 land areas, Authorized Limits or final action levels (FALs) were derived using the Residual Radioactivity (RESRAD) model and computer code (Yu et al., 2001). The goal of this effort was to produce Authorized Limits, in units of picocuries per gram (pCi/g) in soil above background, for CAU 383 that would result in radiation doses less than 25 mrem per year (mrem/y) to an industrial worker at the site.

To develop the FALs, a “realistic” yet conservative radiation dose analysis was conducted using approved exposure scenarios and site-specific data to determine the translation between surface soil concentrations and individual radiation doses. For this analysis, site-specific data included soil sampling results obtained during site investigation activities at CAU 383, and meteorological data obtained from the Air Resources Laboratory (ARL)/Special Operations and Research Division (SORD). This report provides the radiation dose modeling analysis supporting the technical derivation of the Authorized Limits for CAU 383, Area 12 E-Tunnel Sites, Nevada Test Site (NTS), Nevada. This report also defines the radionuclides considered and approved exposure scenarios for the NTS, identifies the applicable exposure pathways and key input data or assumptions, presents the radiation doses for unit concentrations of radionuclides in soil, and establishes the FALs for selected land parcels at CAU 383.

2.0 Facility Description

Corrective Action Unit 383, Area 12 E-Tunnel Sites, consists of three Corrective Action Sites (CASs) located in Area 12. E-Tunnel was mined horizontally into the southeastern side of Rainier Mesa, penetrating a zeolytized bedded tuff. The E-Tunnel Muckpile (CAS 12-06-06) consists of material mined out of the tunnel. The surface elevation at the top of the muckpile is about 6,100 feet (ft) above sea level. The muckpile was deposited in an easterly trend in front of the tunnel portals. The muckpile is approximately 200 ft across and 1,200 ft long in an east-west direction. The thickness of the muckpile ranges from less than 5 ft at the west end to approximately 100 ft at the northeast side.

Corrective Action Site 12-28-02 (Radioactive Material) is located at the E-Tunnel main portal and is part of the muckpile.

Corrective Action Site 12-25-02 (Oil Spill) is located on the blower pad, which is on a bench approximately 100 ft above the E-Tunnel south portal. The pad was constructed in the hillside and is about 100 ft long north to south and 50 ft wide. Fill on the pad varies in thickness from less than 1 ft next to the slope to about 10 ft on the north edge of the pad.

These sites were used during underground nuclear testing at the E-Tunnel from the late 1950s to the late 1970s. The site has mostly been inactive since that period. In addition to the three CASs, ponds 1, 2, and 3 and the drainage between the muckpile and ponds have been included in this site investigation. The CASs and impacted areas investigated during the CAU 383 Corrective Action Investigation (CAI) are:

- CAS 12-06-06, Muckpile and the down slope area (drainage and ponds)
- CAS 12-25-02, Oil Spill
- CAS 12-28-02, Radioactive Material

Each CAS is fully described in the Corrective Action Investigation Plan (CAIP) for CAU 383. To facilitate the development of FALs, land areas included within the CAU 383 CAI were grouped into the following land parcels:

- CAS 12-06-06, Muckpile
 - Muckpile
 - Drainage
 - Ponds
- CAS 12-25-02, Oil Spill
- CAS 12-28-02, Radioactive Material

2.1 Operational History

The following sections provide a brief summary of the operational history for CAU 383.

E-Tunnel was used for nuclear weapons tests between 1958 and 1977. Reentry mining generated rock debris and construction waste such as cabling, scrap metal, and cementitious mixtures, which could have contained low levels of radioactivity. The materials excavated during mining of the tunnel and the reentry mining debris were generally hauled outside the tunnel to the edge of the muckpile, dumped over the edge, and then leveled. Nine nuclear tests were conducted in E-Tunnel. The E-Tunnel Muckpile is comprised of mining, construction, and reentry debris from the tests.

2.2 Release Information

Past surface activities of concern in CAS 12-06-06 include equipment maintenance and storage of equipment and petroleum products. Release to muckpile from surface activities may be locally significant, but vertical infiltration of contaminants is probably limited to less than five ft from the release point. Corrective Action Site 12-28-02 is part of CAS 12-06-06. At CAS 12-25-02 there is a visible oil stain. This is the only evidence found of a potential release at this CAS. Release mechanisms, migration pathways, exposure pathways, and exposure points are described in the CAU 383 CAIP.

3.0 Site Investigation Activities

3.1 Site Investigation Plans

Corrective action investigation activities were performed as set forth in the CAU 383 CAIP (DTRA, 2003) from May 19 through June 24, 2004. The objectives of the CAU 383 CAIP were to address the decision statements in the project-specific Data Quality Objectives (DQOs) by:

- Characterizing the muckpile material from the surface to the native material interface.
- Characterizing the native materials underlying the muckpile (from 2 to 5 ft below the muckpile or until drill refusal) for COPCs.
- Characterizing the soils in the drainage between the muckpile and the first pond.
- Characterizing the pond material in the first three ponds from the surface to the native material interface.
- Characterizing the native materials underlying the first three ponds (from 2 to 5 ft below the pond or until drill refusal) for COPCs.
- Characterizing the soils at the blower pad where the oil stain is located.
- Characterizing the soils in the Radioactive Material area.
- Establishing background levels of radioactivity and metals in the native soils surrounding the muckpile.

The DQO process is a seven-step strategic planning approach based upon the scientific method used to plan data collection activities for CAU 383, Area 12 E-Tunnel Sites, Nevada Test Site. The DQOs are designed to ensure that data collected will provide sufficient and reliable information to identify, evaluate and technically defend the

recommended corrective actions (i.e., no further action, closure in place, or clean closure).

The primary objective of the investigation was to provide sufficient information and data to develop appropriate corrective action alternatives for each CAS in CAU 383. This objective was achieved by identifying the nature and extent, both horizontal and vertical of COCs (i.e., COPCs at concentrations above action levels).

The investigation strategy was developed by representatives of NDEP and DTRA, in accordance with U.S. Environmental Protection Agency (EPA) *Guidance for Quality Assurance Project Plans*, EPA QA/G-5 (EPA, 2002a) and *Guidance for the Data Quality Objectives Process*, EPA QA/G-4 (EPA, 2000b). The investigation strategy also identifies and references the associated EPA Quality System Documents entitled *Data Quality Objectives for Hazardous Waste Site Investigation*, EPA QA/G-4HW (EPA, 2000a), and *Guidance on Choosing a Sampling Design for Environmental Data Collection*, EPA QA/G-5S (EPA, 2002b), upon which the DQO process is based. The CAU 383 CAIP contains a detailed description of the investigation strategy and the DQO process.

3.2 Summary of Specific Site Investigation Activities

This section provides a brief description of work activities conducted to support the investigation of radioactive contamination at CAU 383.

Radiological Surveys

Prior to commencing drilling and sampling, walk-over and drive-over radiological surveys were conducted to identify surface and near-surface areas with elevated readings. The results of the surveys were used to guide the investigation and provide for site worker safety, focusing on the identification of “hot-spot” areas.

Sampling of the Muckpile and Underlying Native Material

Thirty-four locations were drilled or hand sampled on the Muckpile to characterize the muck and the native material under the Muckpile. A total of 1,039.5 ft were drilled in 32 boreholes ranging from 1.5 to 91.5 ft deep. Two locations were sampled by hand to 6 inches deep. Up to three samples were collected from each location. One location was drilled but not sampled. During the characterization, 66 environmental samples were collected. These included 41 muck samples and 25 native material samples. All samples were sent to an approved off-site analytical laboratory for analysis.

Sampling of the Drainage

Thirty-five locations were drilled or hand sampled in the drainage to characterize the site. The two boreholes were each drilled to five ft deep. Thirty-three locations were hand sampled to 6 inches deep. One sample was collected from each location for a total of 35 environmental samples.

Sampling of the Pond Sediments and Underlying Native Material

Nine locations were drilled or hand sampled in Ponds One, Two, and Three to characterize the sediment and the native material under the sediments. In Pond One, a total of 80 ft was drilled in five boreholes ranging in depth from 18.0 to 21.0 ft. Due to soil wetness in Pond Two and Three, only two locations were sampled in each pond; all four locations were hand sampled to 6 inches deep. During the characterization, 14 environmental samples were collected. These included nine sediment samples and five native material samples. All samples were sent to an approved off-site analytical laboratory for analysis.

Sampling of Oil Spill (CAS 12-25-02)

Eight locations were hand sampled to 6 inches deep in the Oil Spill to characterize the site. One sample was collected from each location for a total of eight environmental samples. All samples were sent to an approved off-site analytical laboratory for analysis.

Sampling of the Radioactive Material Area (RMA) (CAS 12-28-02)

Four locations were hand sampled to 6 inches deep in the RMA to characterize the site. One sample was collected from each location for a total of four environmental samples. All samples were sent to an approved off-site analytical laboratory for analysis.

Background and preliminary soil samples were collected at locations on and around the Muckpile. Three background samples were hand-collected at three undisturbed locations around the Muckpile. Preliminary samples were hand-collected at five biased locations on the Muckpile. All samples were sent to an approved off-site analytical laboratory for analysis.

3.3 Sampling Locations

To achieve the objective of identifying the nature and extent of the COCs, a combined random and judgmental (non-probabilistic) sampling scheme was used for selecting sample locations and evaluating analytical results. Judgmental sampling allows the selection of sample locations that target the populations of interest (defined in the DQOs). Sampling points for each CAS were selected based on the approach described in the CAIP, which included interpretation of existing engineering drawings, aerial and land photographs, interviews with former site employees, information obtained during site visits, and site-specific biasing factors. The planned sample locations are discussed the CAIP. Some planned locations were modified slightly from planned positions due to field conditions and observations. Sample locations were staked, labeled appropriately, and surveyed with a global positioning system (GPS) instrument. Appendix A of the CAU 383 CADD/CR contains a detailed description of the actual sample locations.

4.0 Site Investigation Sample Results

The RESRAD calculations are based on validated analytical soil sample results obtained during site investigation activities and other applicable information specified in the CAIP. The RESRAD calculations are based upon the value of the maximum radionuclide concentration, as specified in the CAU 383 CAIP. The RESRAD calculations of the downslope area (i.e., drainage and ponds) were performed for the contaminants of concern (COC) present in the CAU 383 muckpile using the maximum radionuclide concentrations obtained from the downslope area soil sample results. Appendix A of the CAU 383 CADD/CR contains a detailed description of the sample results, analytical parameters, and laboratory methods used to analyze the soil samples. The following section provides a summary of the radiological concentrations from samples taken at CAU 383.

The maximum principal radionuclide concentrations (including background) detected at the CASs included:

Muckpile, CAS 12-06-06

- Muck
 - Americium (Am)-241 28.8 pCi/g
 - Cesium (Cs) -137 1060 pCi/g
 - Europium (Eu)-152 2.64 pCi/g
 - Eu-155 0.32 pCi/g
 - Strontium (Sr) -90 34.1 pCi/g
 - Plutonium (Pu) -238 15.6 pCi/g
 - Pu-239 84 pCi/g
- Drainage
 - Am-241 1.88 pCi/g
 - Cs-137 78.1 pCi/g
 - Sr-90 1.88 pCi/g
 - Pu-238 0.73 pCi/g
 - Pu-239 4.21 pCi/g
- Pond
 - Am-241 0.72 pCi/g
 - Cs-137 91 pCi/g
 - Sr-90 3.62 pCi/g
 - Pu-238 0.74 pCi/g
 - Pu-239 5.37 pCi/g

Oil Spill, CAS 12-25-02

- Cs-137 20.5 pCi/g
- Pu-239 1.04 pCi/g

Radioactive Material, CAS 12-28-02

- Cs-137 114 pCi/g
- Pu-238 0.232 pCi/g

- Pu-239 2.09 pCi/g

The maximum radionuclide concentration values were used to perform the RESRAD calculations.

5.0 Initial Concentrations for Principal Radionuclides

Principal radionuclides are defined as radionuclides with a half-life greater than six months. The decay products of any principal radionuclide down to, but not including, the next principal radionuclide in its decay chain are defined as associated radionuclides. RESRAD assumes that a principal radionuclide is in secular equilibrium with its associated radionuclides at the point of exposure. Therefore, associated radionuclides and radionuclides with half-lives less than six months are not input into the RESRAD calculations.

5.1 Authorized Values for Initial Concentrations of Principal Radionuclides

The authorized exposure scenarios specify that value of the arithmetic mean plus the 95 percent UCL obtained from site-specific sampling results be entered as the principal radionuclide concentrations for RESRAD calculates. The sample results for all samples with radionuclide concentrations above the MDC within the land parcels are entered into the EPA software application ProUCL version 3.0. The ProUCL software is used to calculate the 95 percent UCL for principal radionuclide concentrations based on the distribution of the unknown mean.

For instances where the ProUCL software determined that there was not enough data to calculate the 95 percent UCL for a specific radionuclide, the maximum concentration from the sample dataset was used as the initial concentration for that radionuclide.

5.2 Authorized Values Initial Concentrations of Principal Radionuclides for Area Averaging/Hot-Spot Scenarios

The DOE Order 5400.5 (DOE, 1993) states: “Residual concentrations of radioactive material in soil are defined as those in excess of background concentrations averaged over an area of 100 m²” (5400.5, IV, 4.a.). DOE Order 5400.5 also states: “If the average concentration of any surface or below-surface area less than or equal to 25 m², exceeds the limit or guideline by a factor of $(100/A)^{0.5}$, [where A is the area (in square meters) of the region in which concentrations are elevated], limits for “hot-spots” shall also be developed and applied” (5400.5, IV, 4.a.(1)). DOE G 441.1-XX (DOE 2002) discusses the rationale for the hotspot criterion in Section 5.2.2.

The purpose of the hot-spot criterion is to ensure that applying the homogeneous criteria, in which the concentrations of residual radioactive material are averaged over a 100 m² area, does not result in the release of small areas that, because of averaging, contain unacceptably high concentrations of residual radioactive material. The hot-spot criterion is used to supplement Authorized Limits for larger areas and is intended to prevent excessive exposures from a small, contaminated area that is within a larger area that meets the basic Authorized Limits. Thus, it is intended for use in areas where the residual radioactive material concentrations are not uniform. Also, the above hotspot criterion was derived conservatively, assuming the Authorized Limits were based on a dose constraint of 25 mrem/y and selected to ensure unlikely exposure conditions would not cause the primary dose limit (100 mrem/y) to be exceeded. The authorized exposure scenarios specify that the value of the maximum concentration of principal radionuclides obtained from site-specific sampling results be entered as the principal radionuclide concentrations for RESRAD hot-spot calculations. The authorized area parameters for RESRAD hot-spot calculations are 1 m², 10 m², and 100 m² contamination areas.

5.3 Initial Concentrations of Principal Radionuclide for CAU 383

These maximum radionuclide concentration values were used to perform the RESRAD calculations.

The initial radionuclide concentrations used for the three RESRAD calculations are those listed in Table 7-2 for each CAS and location.

5.4 Inhomogeneous Contamination and Initial Radionuclide Concentrations

A contaminated zone is inhomogeneous if it contains a contaminated region within which the concentration of a radionuclide exceeds three times the average for the contaminated zone. RESRAD uses a mathematical construct that assumes uniform distribution of radionuclides within a volume. However, RESRAD recognizes that radiological contamination is inhomogeneous in nature and provides detailed guidance for applying inhomogeneous criteria (hot spot criteria, sum of fractions rule, etc.). The RESRAD User Manual states that the inhomogeneous release criteria are generally more realistic and hence less restrictive than the homogeneous release criteria. This shows that the approved initial radionuclide concentration values (i.e., arithmetic mean plus 95 percent UCL or the maximum radionuclide concentration from the sample dataset) will result in more restrictive release criteria. The arithmetic mean plus the 95 percent UCL are used for the initial concentrations of principal radionuclides when the sample results are obtained using a random sampling method. The maximum radionuclide concentration values are used for the initial concentrations of principal radionuclides when the sample results are obtained using a non-random (e.g., bias or judgmental sampling) sampling method.

RESRAD states that a statistical approach should always be considered as a first priority regarding the estimation of soil concentrations, as cited in the *Data Collection Handbook to Support Modeling Impacts of Radioactive Material in Soil* (Yu et al., 1993). The 95 percent UCL represents a value that has a 5 percent chance that the actual mean of the dataset would exceed it. The 95 percent UCL is computed using the EPA code ProUCL. The code calculates the 95 percent UCL based on the distribution of the dataset (e.g., normal, log-normal, gamma, non-parametric, etc.).

The ProUCL software has been developed to compute an appropriate 95 percent UCL of the unknown population mean to support exposure assessment and cleanup decisions for EPA projects. A 95 percent UCL of the unknown population arithmetic mean is often used to:

- Estimate the EPC term,
- Determine the attainment of cleanup standards,
- Estimate background level mean contaminant concentrations, or
- Compare the soil concentrations with site-specific soil screening levels.

It is important to compute a reliable, conservative, and stable 95 percent UCL of the population mean using the available data. The 95 percent UCL should approximately provide the 95 percent coverage for the unknown population mean.

The EPA has recommended that the maximum value of the dataset be used for the initial EPC term when the 95 percent UCL exceeds the maximum (EPA RAGS Document, 1992). However, if the

maximum value of the dataset is used, then most of the statistical data associated with the distribution of the dataset is ignored (except for the maximum). Therefore, by using the mean plus the 95 percent UCL the statistical data associated with the dataset is retained and the value approaches or exceeds the maximum value of the dataset as recommended by EPA.

6.0 Authorized RESRAD Exposure Pathways and Scenarios

This section describes the input parameters, exposures scenarios, and guidance for calculating site-specific radiological remediation levels for projects using the RESRAD computer code, as agreed to by NNSA/NSO, Stoller-Navarro Joint Venture (SNJV), Bechtel Nevada (BN), and NDEP.

6.1 Guidance for RESRAD Calculations

The guidance in this section was developed by NNSA/NSO, SNJV, BN, and NDEP and is only applicable to soils containing residual radioactive material. This guidance does not apply to structures, facilities, equipment, and building materials containing contaminated surfaces or volume contamination. The primary dose limit for any member of the public is 100-mrem total effective dose equivalent (TEDE) in a year. This limit applies to the sum of internal and external doses resulting from all modes of exposure to all radiation sources other than background radiation and doses received as a patient from medical sources as required by DOE 5400.5, II.1.a.(3)(a) (DOE, 1993). The dose constraint is defined as one quarter of the dose limit (i.e., 25-mrem) and will be applied to ensure that in a 1,000-year period the maximally exposed individual does not exceed the dose constraint in any single year. The requirements of Chapter IV of DOE 5400.5 Chapter IV will not specifically apply if NNSA/NSO chooses to continue to own and actively control access or use of the site. However, the radiation protection requirements in the other sections of DOE 5400.5 will apply to NNSA/NSO owned and maintained sites.

Due to the large spatial variability in background amongst sites, the “above background criterion” will be defined as the concentration of a specific radionuclide in soil that equals or exceeds its corresponding PAL. The source data for these radionuclide specific PALs are taken directly from NCRP Report No. 129 Table 2.1, Construction, Commercial, Industrial land-use scenario column for a 25-mrem dose constraint (NCRP, 1999). The generic guidelines for residual concentrations of Radium (Ra)-226, Ra-228, Thorium (Th)-230, and Th-232 are found in Chapter IV of DOE Order 5400.5, Change 2 “*Radiation Protection of the Public and Environment*.”

Background radiation refers to the local area and includes:

- Concentration of naturally occurring radionuclides.
- Cosmic radiation.
- Radionuclides of anthropogenic origin that have been globally dispersed and are present at low concentrations such as fallout from nuclear weapons. (Note: This is not the case at the NTS because the historical aspects of the NTS, e.g., above- and below-ground testing, and other operations resulted in dispersion of radionuclides locally.)

Due to the impracticality of determining “true” background, a dose constraint with no background subtraction will be used (i.e., a dose constraint not in excess of background). The use of the dose constraint with no background subtraction is a far more conservative and sensitive approach because it does not deal with the uncertainty of natural background.

6.2 Description of Approved Scenarios

Based on the future land use as identified in the *Nevada Test Site Resource Management Plan* (DOE/NV, 1998), the following two exposure scenarios have been identified as “actual” and “likely” use scenarios. Stoller-Navarro Joint Venture has approval to use two scenarios (Scenario A and Scenario B) for use with the RESRAD code (NDEP, 2004). Both scenarios consider radiation exposures to the critical population group via the following pathways:

- Direct exposure to external radiation from the contaminated soil.
- Internal dose from inhalation of airborne radionuclides.
- Internal dose from ingestion of contaminated soil.

The two scenarios vary the parameters associated with the future land use of the site but use the same dose constraint parameter of 25 mrem/yr. Scenario A is approved for sites in Mercury or within 500 ft of an active building. Scenario B is approved for all other sites. Scenarios A and B are briefly described below.

For Scenario A, the future land use assumes continued industrial use of the site. This scenario addresses long-term exposure received by industrial workers exposed daily to residual levels of radionuclides in soil during an average workday outdoors on site (EPA, 1991). Scenario A parameters are based on the following:

- A worker will be outdoors at the site for a total of 2,000 hr per year (hr/yr) (250 days per year, 8 hours per day) for a duration of 25 years.
- Indoor fraction time is zero, which means that the worker is outside being exposed for the entire workday.
- The outdoor time fraction is 0.228 and is calculated by dividing the total work hours at the site per year (2,000 hr/yr) by the total number of hours in a year (8,760 hr/yr).
- Worker exposures are limited to working hours and do not include contributions from ingestion of drinking water, plant foods, meat, or fish taken from the immediate area.

For Scenario B, the future land use assumes land use restrictions with a low occupancy factor and lighter work activities at the site. The assumptions for Scenario B include the following:

- A worker will be at the site and outdoors for a total of 335 hr/yr for a duration of 25 years.
- The indoor fraction time is zero
- The outdoor time fraction is 0.038, which is calculated by dividing the total work hours at the site per year (335 hr/yr) by the total number of hours in a year (8,760 hr/yr).
- The worker exposures are limited to working hours and do not include contributions from ingestion of drinking water, plant foods, meat or fish taken from the immediate area.

When Scenario B is selected, a Use Restriction will be included at closure that will state the use scenario and the requirement for an occupant agency or entity to re-evaluate the closure if site use changes to fit the parameters of Scenario A.

Table 6-1 lists the pathways considered for Scenarios A and B.

Table 6-1. Summary of Pathways Considered for Scenarios A and B

Pathway	Scenario A	Scenario B
External exposure	Yes	Yes
Particulate inhalation	Yes	Yes
Radon inhalation	No	No
Ingestion of soil	Yes	Yes
Ingestion of produce from on-site garden	No	No
Ingestion of meat from on-site livestock	No	No
Ingestion of milk from on-site livestock	No	No
Ingestion of fish from on-site pond	No	No
Ingestion of water from on-site well	No	No

6.3 RESRAD Parameters

The RESRAD User's Manual states that: "The RESRAD default parameter values were carefully selected and are realistic, although conservative, parameter values. (In most cases, use of these values will not result in underestimation of the dose or risk.) Site-specific parameters should be used whenever possible. Therefore, use of default values that significantly overestimate the dose or risk for a particular site is discouraged" (Yu et al., 2001).

Table 6-2 lists all of the RESRAD default values along with the site-specific RESRAD parameters approved for use with Scenarios A and B. A reference or reason is provided for parameters that require site-specific input.

Table 6-2. Approved RESRAD Parameters

Parameter	Units	Scenario A	Scenario B	Defaults	Reference/Rationale
Dose Conversion Factors					Use FGR 13 Morbidity
R02 Exposure Pathways					
Pathway 1- External Gamma		Active	Active		
Pathway 2- Inhalation		Active	Active		
Pathway 3- Plant Ingestion		Suppressed	Suppressed		
Pathway 4- Meat Ingestion		Suppressed	Suppressed		
Pathway 5- Milk Ingestion		Suppressed	Suppressed		
Pathway 6- Aquatic Foods		Suppressed	Suppressed		
Pathway 7- Drinking Water		Suppressed	Suppressed		
Pathway 8- Soil Ingestion		Active	Active		
Pathway 9- Radon		Suppressed	Suppressed		
R011 Contaminated Zone					
Area of CZ	m ²	Site Specific	Site Specific	1.000E+04	Maximum area of contamination out to two successive sample intervals below PALs. (~ 15 ft intervals laterally)
Thickness of CZ	m	Site Specific	Site Specific	2.000E+00	Maximum identified depth plus two successive intervals below PALs as identified during the site characterization. (~ 5 ft. intervals vertically)
Length Parallel to Aquifer Flow	m	not used	not used	1.000E+02	Not used with the above pathway selection
Radiation Dose Limit	mrem/yr	25	25	2.5E+001	RESRAD Default (DOE, 1993)
Elapsed Time Since Placement of Material	yr	0.0	0.0	0.0	RESRAD Default
R012 Initial Principal Radionuclide					
Site Specific Parent Radionuclide with half-life greater than 180 days, does not include naturally occurring and primordial radionuclides	pCi/g	Site Specific	Site Specific	0.0	The arithmetic mean plus the 95% UCL for the site.

Table 6-2. Approved RESRAD Parameters

Parameter	Units	Scenario A	Scenario B	Defaults	Reference/Rationale
R013 Cover and Contaminated Zone Hydrological Data					
Cover Depth	m	Site Specific	Site Specific	0.0	The minimum depth as identified during the site characterization
Density of Cover Material	g/cm ³	1.5	1.5	1.5	RESRAD Default unless site data significantly different
Cover Depth Erosion Rate	m/yr	1.000E-03	1.000E-03	1.000E-03	RESRAD Default unless site data significantly different
Density of Contaminated Zone	g/cm ³	1.5	1.5	1.5	RESRAD Default unless site data significantly different
Contamination Zone Erosion Rate	m/yr	1.000E-03	1.000E-03	1.000E-03	RESRAD Default unless site data significantly different
Contaminated Zone Total Porosity	-	4.000E-01	4.000E-01	4.000E-01	RESRAD Default unless site data significantly different
Contaminated Zone Field Capacity	-	2.000E-01	2.000E-01	2.000E-01	RESRAD Default unless site data significantly different
Contaminated Zone Hydraulic Conductivity	m/yr	1.000E+01	1.000E+01	1.000E+01	RESRAD Default unless site data significantly different
Contaminated Zone b Parameter	-	5.300E+00	5.300E+00	5.300E+00	RESRAD Default unless site data significantly different
Average Annual Wind Speed	m/sec	Site Specific	Site Specific	2.000E+00	Data from Air Resources Laboratory http://www.sord.nv.doe.gov/arl/sord-1.htm
Humidity in Air	g/m ³	not used	not used	8.000E+00	Not used with the above pathway selection
Evapotranspiration Coefficient	-	5.000E-01	5.000E-01	5.000E-01	RESRAD Default not significant due to lack of groundwater pathway
Precipitation	m/yr	Site Specific	Site Specific	1.000E+00	Data from Air Resources Laboratory http://www.sord.nv.doe.gov/arl/sord-1.htm
Irrigation	m/yr	0	0	2.000E-01	Assumes no artificial supply of water to soil
Irrigation Mode	-	overhead	overhead	overhead	RESRAD Default
Runoff Coefficient	-	4.000E-01	4.000E-01	2.000E-01	Open Sandy Loam 30% impervious Table 10.1 (Yu, et. al., 1993)
Watershed Area for Nearby Stream or Pond	m ²	not used	not used	1.000E+06	Not used with the above pathway selection
Accuracy for Water/Soil Computations	-	not used	not used	1.000E-03	Not used with the above pathway selection

Table 6-2. Approved RESRAD Parameters

Parameter	Units	Scenario A	Scenario B	Defaults	Reference/Rationale
R014 Saturated Zone Hydrological Data					
Density of Saturated Zone	g/cm ³	not used	not used	1.500E+00	Not used with the above pathway selection
Saturated Zone Total Porosity	-	not used	not used	4.000E-01	Not used with the above pathway selection
Saturated Zone Effective Porosity	-	not used	not used	2.000E-01	Not used with the above pathway selection
Saturated Zone Field Capacity	-	not used	not used	2.000E-01	Not used with the above pathway selection
Saturated Zone Hydraulic Conductivity	m/yr	not used	not used	1.000E+02	Not used with the above pathway selection
Saturated Zone Hydraulic Gradient	-	not used	not used	2.000E-02	Not used with the above pathway selection
Saturated Zone b Parameter	-	not used	not used	5.300E+00	Not used with the above pathway selection
Water Table Drop Rate	m/yr	not used	not used	1.000E-03	Not used with the above pathway selection
Well Pump Intake Depth	m	not used	not used	1.000E+01	Not used with the above pathway selection
Model: Nondispersion or Mass-Balance	-	ND	ND	ND	RESRAD Default
Well Pumping Rate	m ³ /yr	not used	not used	2.500E+02	Not used with the above pathway selection
R015 Uncontaminated and Unsaturated Strata Hydrological Data					
Number of Unsaturated Zone Strata	-	not used	not used	1	Not used with the above pathway selection
Thickness	m	not used	not used	4.000E+00	Not used with the above pathway selection
Soil Density	g/cm ³	not used	not used	1.500E+00	Not used with the above pathway selection
Total Porosity	-	not used	not used	4.000E-01	Not used with the above pathway selection
Effective Porosity	-	not used	not used	2.000E-01	Not used with the above pathway selection
Field Capacity	-	not used	not used	2.000E-01	Not used with the above pathway selection
Soil-specific b Parameter	-	not used	not used	5.300E+00	Not used with the above pathway selection
Hydraulic Conductivity	m/yr	not used	not used	1.000E+01	Not used with the above pathway selection

Table 6-2. Approved RESRAD Parameters

Parameter	Units	Scenario A	Scenario B	Defaults	Reference/Rationale
R016 Distribution Coefficients and Leach Rates					
Contaminated Zone K_d (all Zones)	cm ³ /g				RESRAD Defaults
Saturated Leach Rate	/yr	0.0	0.0	0.0	Not used
Solubility Constant	-	0.0	0.0	0.0	Not used
R017 Inhalation and External Gamma					
Inhalation Rate	m ³ /yr	8.400E+03	1.230E+04	8.400E+03	RESRAD Default and for an individual performing outdoor activities, a typical activity mix can consist of 37% at a moderate activity level, 28% at both resting and light activity levels, and 7% at a heavy activity level, which results in a 1.4 m ³ /h (12,300 m ³ /yr) inhalation rate. (Yu, et. al., 1993)
Mass Loading for Inhalation	g/m ³	6.00E-04	6.00E-04	1E-04	The estimated mass loading for construction activities. (Yu, et. al., 1993)
Exposure Duration	yr	25	25	30	Standard for Industrial/Commercial Scenario
Shielding Factor Inhalation	-	1	1	0.4	Assumes no indoor time fraction.
Shielding Factor External Gamma	-	1	1	0.7	Assumes no indoor time fraction.
Fraction of Time Spent Indoors	-	0.0	0.0	0.5	Assumes no indoor time fraction.
Fraction of Time Spent Outdoors	-	0.228	0.038	0.25	Based on Industrial/Commercial use scenarios for standard occupancy and low occupancy.
Shape Factor	-	1.0	1.0	1.0	RESRAD Default

Table 6-2. Approved RESRAD Parameters

Parameter	Units	Scenario A	Scenario B	Defaults	Reference/Rationale
R018 Ingestion Pathway Data, Dietary Parameters					
Fruits, Vegetables, and Grain Consumption	kg/yr	not used	not used	1.600E+02	Not used with the above pathway selection
Leafy Vegetable Consumption	kg/yr	not used	not used	1.400E+01	Not used with the above pathway selection
Milk Consumption	L/yr	not used	not used	9.200E+01	Not used with the above pathway selection
Meat and Poultry Consumption	kg/yr	not used	not used	6.300E+01	Not used with the above pathway selection
Fish Consumption	kg/yr	not used	not used	5.400E+00	Not used with the above pathway selection
Other Seafood Consumption	kg/yr	not used	not used	9.000E-01	Not used with the above pathway selection
Soil Ingestion Rate	g/yr	1.752E+02	1.752E+02	36.5	480 mg/day (EPA, 1991)
Drinking Water Intake	L/yr	not used	not used	5.100E+02	Not used with the above pathway selection
Drinking Water Contaminated Fraction	-	not used	not used	1.000E+00	Not used with the above pathway selection
Household Water Contaminated Fraction	-	not used	not used	1.000E+00	Not used with the above pathway selection
Livestock Water Contaminated Fraction	-	not used	not used	1.000E+00	Not used with the above pathway selection
Irrigation Water Contaminated Fraction	-	not used	not used	1.000E+00	Not used with the above pathway selection
Aquatic Food Contamination Fraction	-	not used	not used	5.000E-01	Not used with the above pathway selection
Plant Food Contamination Fraction	-	not used	not used	-1	Not used with the above pathway selection
Meat Contamination Fraction	-	not used	not used	-1	Not used with the above pathway selection
Milk Contamination Fraction	-	not used	not used	-1	Not used with the above pathway selection
R019 Ingestion Pathway Data, Nondietary					
Livestock Fodder Intake for Meat	kg/day	not used	not used	6.800E+01	Not used with the above pathway selection
Livestock Fodder Intake for Milk	kg/day	not used	not used	5.500E+01	Not used with the above pathway selection
Livestock Water Intake for Meat	L/day	not used	not used	5.000E+01	Not used with the above pathway selection
Livestock Water Intake for Milk	L/day	not used	not used	1.600E+02	Not used with the above pathway selection

Table 6-2. Approved RESRAD Parameters

Parameter	Units	Scenario A	Scenario B	Defaults	Reference/Rationale
Livestock Soil Intake	kg/day	not used	not used	5.000E-01	Not used with the above pathway selection
Mass Loading for Foliar Deposition	g/m ³	not used	not used	1.000E-04	Not used with the above pathway selection
Depth of Soil Mixing layer	m	not used	not used	1.500E-01	Not used with the above pathway selection
Depth of Roots	m	not used	not used	9.000E-01	Not used with the above pathway selection
Drinking Water Fraction from Groundwater	-	not used	not used	1.000E+00	Not used with the above pathway selection
Household Water Fraction from Groundwater	-	not used	not used	1.000E+00	Not used with the above pathway selection
Livestock Water Fraction from Groundwater	-	not used	not used	1.000E+00	Not used with the above pathway selection
Irrigation Fraction from Groundwater	-	not used	not used	1.000E+00	Not used with the above pathway selection
R021 Radon					
Radon Parameters Not Used					Not used with the above pathway selection

6.4 Residual Radioactive Material Guidelines

The residual radioactive material guideline represents the concentration of residual radioactive material that can remain in place and still allow use of that area without radiological restrictions. Using site-specific parameters and sample analysis results, the radioactive material guideline, G , can be calculated for a given dose limit of H_{EL} for an individual as follows;

$$G = H_{EL} / DSR,$$

where DSR is the total dose/source concentration ratio. The dose limit H_{EL} , used to derive the residual radioactive material guideline is 25 mrem/yr.

Single radionuclide guidelines are calculated for individual radionuclides such that the annual dose to industrial/construction workers at the site should not exceed an annual dose limitation of 25 mrem/yr. Sites contaminated with two or more radionuclides (i.e., a mixture of radionuclides) require further evaluation to ensure that collective exposures from individual radionuclides do not exceed the 25 mrem/yr annual dose constraint. This evaluation is performed using a sum of the fractions method. The initial soil concentration of each radionuclide is divided by the single radionuclide guideline for that radionuclide to produce a ratio. These ratios are then summed. If the sum is less than or equal to unity, then the collective annual dose from all radionuclides at the site should not exceed the 25 mrem/yr annual dose constraint. If the sum does exceed unity, the annual dose to industrial/construction workers could exceed the 25 mrem/yr dose constraint, even if the concentrations of residual radionuclides at the site are below the single radionuclide guideline values. For sites where the sum of the ratios exceeds unity, residual radioactive material guidelines for mixtures of radionuclides are calculated such that the following equation is satisfied;

$$\overline{M} = \sum_i \overline{S}_i(0) / G_i(t_m) \leq 1$$

Where:

$\overline{M}$	=	average mixture sum (dimensionless)
$\overline{S}_i(0)$	=	initial concentration of the i th principal radionuclide averaged over an area determined by scenario activities
$G_i(t_m)$	=	single radionuclide soil concentration guideline for the i th principal radionuclide at time t maximum.

For a site where the sum of the ratios does not exceed unity, the residual radioactive guidelines for single radionuclides are the radionuclide concentrations to be used as the FAL. For sites where the sum of the ratios exceeds unity, the residual radioactive guidelines for mixtures of radionuclides are mathematically adjusted so that the above equation is satisfied. Those adjusted values are then used as the FAL.

7.0 RESRAD Calculations for CAS 12-06-06, Muckpile and the Down Slope Area (Drainage and Pond)

This section discusses the RESRAD calculations and results for CAS 12-06-06, Muckpile and the down slope area.

7.1 Selection of RESRAD Exposure Scenario

Scenario B was selected as the exposure scenario for the CAS 12-06-06 because of the remote location of the site. Because Scenario B parameters will be used for these calculations, a Use Restriction will be implemented at closure that will state the use scenario and the requirement for an occupant agency or entity to re-evaluate the closure if site use changes to fit the parameters of Scenario A.

7.2 User Input Parameters

The RESRAD default parameters that were modified for the calculations performed for CAU 383 in this report and the site-specific values entered are presented in Table 7-1, RESRAD Parameter Input Values for CAU 383. A complete list of the RESRAD default parameters and the parameters used for CAU 383 is provided in Table A.1 of Attachment A.

7.3 Radionuclide Concentrations and Dose Estimates

The maximum dose results from RESRAD calculations for the areas of Muck (98.31 mrem/yr), Drainage (2.35 mrem/yr), and Pond (8.33 mrem/yr) are evaluated and the most conservative results, i.e., Muck) is selected to represent this CAS. The detailed RESRAD results for all three portions of this CAS are provided in Exhibit 1, RESRAD Summary Report: CAU 383 CAS 12-06-06.

Uncertainty in the derivation of dose estimates and dose/source contribution ratios comes from the distribution of possible input parameter values, as well as uncertainty in the conceptual model used to represent the site. The pathway contributions to the total annual dose at time zero are almost all (98.45 percent) for external exposure, 1.20 percent for inhalation, and 0.34 percent for soil ingestion pathways. Therefore, uncertainties in the following parameters: Erosion rates, thickness of contaminated zone, occupancy factors, and wind speed have the greatest significance on the model predictions.

The maximum dose contributions and total dose/source concentration ratios for the muckpile under Scenario B parameters have been predicted to occur at time zero. The calculated maximum dose contributions for all considered pathways are presented in Table 7-3, Maximum Dose Contributions for CAS 12-06-06 Using Scenario B. Figure 7-1, CAU 383 CAS 12-06-06 Scenario B: Dose Rate Per Year All Radionuclides Summed, All Pathways Summed, shows that at time zero, the TEDE to industrial/construction workers for the considered pathways is 98.31 mrem/yr which is above the 25 mrem/yr dose constraint.

Figure 7-2. CAU 383 CAS 12-06-06 Scenario B: Annual Dose All Radionuclides Summed, Component Pathways, shows the breakdown of the total dose into the component pathways. Together, Table 7-2 and Figures 1 and 2 show that the dose from Cs-137 at time zero is 96.30 mrem/year and drops to zero after the 300-year time interval. The result also shows that the annual dose from external radiation (almost all from Cs-137) at time zero is 96.26 mrem/year and is reduced to zero within 300 years.

Because Cs-137 has a half-life of 30 years, the concentration of Cs-137 at this site will not decay to a level below the 25 mrem/yr constraint through the radioactive decay processes within the first 50-year time interval (the annual dose at year 50 is 25.41 mrem). Site remediation and/or controls that reduce workers exposures and minimize the spread of radioactive contamination into uncontaminated areas are recommended for this site.

7.4 Residual Radioactive Material Guidelines for CAS 12-06-06

The sum of the ratios for CAS 12-06-06 exceeded unity. Residual radioactive guidelines for mixtures of radionuclides were calculated for this CAS. Table 7-4, presents the calculations results for deriving guidelines for mixtures radionuclides for this CAS. The residual radioactive material guidelines for single radionuclides and mixture radionuclides are listed in Table 7-4, Residual Radioactive Material Guidelines for Single Radionuclides and Radionuclide Mixtures. The FALs for the CAS 12-06-06 scenario are the residual radioactive material guideline values for mixture radionuclides.

Figure 7-1. CAU 383 CAS 12-06-06, Muckpile, Scenario B: Dose Rate Per Year, All Radionuclides Summed, All Pathways Summed

Figure 7-2. CAU 383 CAS 12-06-06, Muckpile, Scenario B: Annual Dose, All Radionuclides Summed, Component Pathways

Table 7-2. Principal Radionuclide Concentrations Used for CAU 383 REARAD Calculations (pCi/g)

	CAS 12-06-06			CAS 12-25-02	CAS 12-28-02
	Muck	Drainage	Pond		
Americium-241	28.8	1.88	0.72	NA	NA
Cesium-137	1060	25.41	91	20.5	114
Europium-152	2.64	NA	NA	NA	NA
Strontium-90	34.1	0.97	3.62	NA	NA
Plutonium-238	15.6	0.2	0.361	NA	0.232
Plutonium-239	84	1.52	4.49	1.04	2.09

Table 7-3. Maximum Dose Contributions for CAS 12-06-06* Using Scenario B (occurs at t=0)(mrem/yr)

Radionuclide	Ground		Inhalation		Soil		Total	
	Annual Dose	Fraction	Annual Dose	Fraction	Annual Dose	Fraction	Annual Dose	Fraction
Americium-241	3.935E-02	0.0004	2.729E-01	0.0028	6.876E-02	0.0007	3.810E-01	0.0039
Cesium-137	9.626E+01	0.9791	7.217E-04	0.0000	3.476E-02	0.0004	9.630E-01	0.9795
Europium-152	4.688E-01	0.0048	1.227E-05	0.0000	1.106E-05	0.0000	4.688E-01	0.0048
Plutonium-238	8.080E-05	0.0000	1.315E-01	0.0013	3.299E-02	0.0003	1.646E-01	0.0017
Plutonium-239	7.545E-04	0.0000	7.780E-01	0.0079	1.973E-02	0.0020	9.760E-01	0.0099
Strontium-90	2.338E-02	0.0002	9.452E-04	0.0000	3.392E-03	0.0000	2.772E-02	0.0003
Total	9.679E+01	0.9845	1.184E-01	0.0120	3.372E-01	0.0034	9.831E+01	1.0000

*The conservative results from Muck data are used as representative for this CAS.

Table 7-4. CAU 383 CAS 12-06-06 Sum of Fractions and Proportional Scaling

Radionuclide	Initial Radionuclide Concentration (pCi/g)	Contribution %	Single Radionuclide Guidelines (pCi/g)	Ratio for Single Radionuclide Guideline	Mixture Radionuclides Guidelines	Ratio for Mixture Radionuclide Guidelines
Americium-241	28.8	2.35	1890	0.02	7.32	0.00
Cesium-137	1060	86.52	275.2	3.85	269.56	0.98
Europium-152	2.64	0.22	140.8	0.02	0.67	0.00
Plutonium-238	15.6	1.27	2370	0.01	3.97	0.00
Plutonium-239	84	6.86	2152	0.04	21.36	0.01
Strontium-90	34.1	2.78	30760	0.00	8.67	0.00
Total	1225.14				311.55	1.00

Table 7-5. Residual Radioactive Material Guidelines for Single Radionuclides and Radionuclide Mixtures*

Radionuclides	CAS 12-06-06 Guidelines (pCi/g)		CAS 12-25-02 Guidelines (pCi/g)	CAS 12-28-02 Guidelines (pCi/g)
	*Single Radionuclide	*Mixture Radionuclide	*Single Radionuclide	*Single Radionuclide
Americium-241	1890	7.32	-	-
Cesium-137	275.2	269.56	275.2	275.2
Europium-152	140.8	0.67	-	-
Plutonium-238	2370	3.97	-	2370
Plutonium-239	2152	21.36	2152	2152
Strontium-90	30760	8.67	-	-

*Single radionuclide guidelines apply to areas uniformly contaminated with a single radionuclide. The mixture radionuclide guidelines apply to areas uniformly contaminated with a mixture of radionuclides. The FALs for all three land parcels are the radionuclide guidelines for mixture radionuclides (i.e., Mixture Radionuclide columns).

Table 7-1. RESRAD Parameters Input Values for CAU 383 (Page 1 of 2)

Parameter	Units	CAS 12-06-06	CAS 12-25-02	CAS 12 28-02	Defaults	Reference/Rationale
R011 Contaminated Zone						
Area of CZ	m ²	1.000E+02	1.000E+02	1.000E+02	1.000E+04	Estimated using the site boundary
Thickness of CZ	m	1.500E-01	1.500E-01	1.500E-01	2.000E+00	Top layer of the contamination soil
R012 Initial Principal Radionuclide						
Principal radionuclides	pCi/g	See Table 7.2	See Table 7.2	See Table 7.2	0.0	Initial concentrations are the maximum concentrations from sample results: maximum for biased sample or average for random sample.
R013 Cover and Contaminated Zone Hydrological Data						
Average Annual Wind Speed	m/sec	3.4	3.4	3.4	2.000E+00	Data from Air Resource Laboratory (2005)
Precipitation	m/yr	3.260E-01	3.260E-01	3.260E-01	1.000E+00	Data from Air Resources Laboratory
Runoff Coefficient	-	4.000E-01	4.000E-01	4.000E-01	2.000E-01	Open Sandy Loam 30% impervious Table 10.1 (Yu, et al., 1993)
R017 Inhalation and External Gamma						
Inhalation Rate	m ³ /yr	1.230E+04	1.230E+04	1.230E+04	8.400E+03	RESRAD Default and for an individual performing outdoor activities, a typical activity mix can consist of 37% at a moderate activity level, 28% at both resting and light activity levels, and 7% at a heavy activity level, which results in a 1.4 m ³ /h (12,300 m ³ /yr) inhalation rate. (Yu, et al., 1993)
Mass Loading for Inhalation	g/m ³	6.00E-04	6.00E-04	6.00E-04	1E-04	The estimated mass loading for construction activities. (Yu, et al., 1993)
Exposure Duration	yr	25	25	25	30	Standard for Industrial/Commercial Scenario
Shielding Factor Inhalation	-	1.0	1.0	1.0	0.4	Assumes no indoor time fraction

Table 7-1. RESRAD Parameters Input Values for CAU 383 (Page 1 of 2)

Parameter	Units	CAS 12-06-06	CAS 12-25-02	CAS 12 28-02	Defaults	Reference/Rationale
Shielding Factor External Gamma	-	1.0	1.0	1.0	0.7	Assumes no indoor time fraction
Fraction of Time Spent Indoors	-	0.0	0.0	0.0	0.5	Assumes no indoor time fraction
Fraction of Time Spent Outdoors	-	0.038	0.038	0.038	0.25	Scenario specific based on Industrial/Commercial Use Scenarios for standard occupancy and low occupancy.
Soil Ingestion Rate	g/yr	1.752E+02	1.752E+02	1.752E+02	36.5	EPA, 1991; 480 mg/day

cm^3/g = Cubic centimeters per gram
 g/cm^3 = Grams per cubic centimeter
 g/m^3 = Grams per cubic meter
 g/yr = Grams per year
 kg/day = Kilograms per day
 kg/yr = Kilograms per year
 L/day = Liters per day
 L/yr = Liters per year
 m = Meter
 m^2 = Square meter
 m^2 = Square meter
 m/sec = Meters per second
 m/yr = Meters per year
 m^3/h = Cubic meters per hour
 m^3/yr = Cubic meters per year
 mrem/yr = Millirem per year
 N/A = Not applicable
 pCi/g = Picocuries per gram
 yr = Year
 $/\text{yr}$ = Per year
 UCL = Upper confidence level

8.0 RESRAD Calculations for CAS 12-25-02, Oil Spill

This section discusses the RESRAD calculations and results for CAS 12-25-02, Oil Spill.

8.1 Selection of RESRAD Exposure Scenario

Scenario B was selected as the exposure scenario for the CAS 12-25-02 because of its remote location. Because Scenario B parameters will be used for these calculations, a Use Restriction will be implemented at closure that will state the use scenario and the requirement for an occupant agency or entity to re-evaluate the closure if site use changes to fit the parameters of Scenario A.

8.2 User Input Parameters

The RESRAD default parameters that were altered for the calculations in this report and the site-specific values entered are presented in Table 7-1, RESRAD Parameters Input Values for CAU 383. A complete list of the RESRAD default parameters and the parameters used for CAU 383 is provided in Table A.1 of Attachment A.

8.3 Radionuclide Concentrations and Dose Estimates for CAS 12-25-02

Uncertainty in the derivation of dose estimates and dose/source contribution ratios comes from the distribution of possible input parameter values, as well as uncertainty in the conceptual model used to represent the site. The pathway contributions to the total annual dose at time zero are 99.32 percent for external exposure, 0.51 percent for inhalation, and 0.17 percent for soil ingestion pathways. Therefore, uncertainties in the following parameters: Erosion rates, thickness of contaminated zone, occupancy factors, and wind speed have the greatest significance on the model predictions. The RESRAD results for this CAS do not include the effects of soil migration (contaminated or clean) into the site from the adjacent land areas. The input parameters entered into the RESRAD code for this analysis are listed in Exhibit 2, RESRAD Summary Report: CAU 383 CAS 12-25-02.

The maximum dose contributions and total dose/source concentration ratios for CAS 12-25-02 under Scenario B parameters have been predicted to occur at time zero. The calculated maximum dose contributions for all considered pathways are presented in Table 8-1, Maximum Dose Contributions for CAS 12-25-02 Using Scenario B. and Figure 8-1. CAU 383 CAS 12-25-02 Scenario B: Dose Rate Per Year All Radionuclides Summed, All Pathways Summed, shows that at time zero, the TEDE to industrial/construction workers for the considered pathways is 1.87 mrem/yr, which is below the 25 mrem/yr dose constraint.

Figure 8-2. CAU 383 CAS 12-25-02 Scenario B: Annual Dose All Radionuclides Summed, Component Pathways, shows the breakdown of the total dose into the component pathways. Together, Table 8-1 and Figures 8-1 and 8-2 show that at time zero, the annual dose from Pu-239 is 1.21E-02 mrem/yr (0.64 percent of the total dose), and Cs-137 is 1.86 mrem/yr (99.36 percent of the total dose).

This result also shows that the annual dose at time zero for external radiation is 1.86 mrem/year, for inhalation 9.65E-03 mrem/yr, and for ingestion of soil 2.12E-03 mrem/yr. The calculated annual dose to industrial/construction workers for CAS 12-25-02 will fall to zero within 300 years.

As best management practices, site remediation and/or controls that reduce workers exposures and minimize the spread of radioactive contamination into uncontaminated areas are recommended for this site. As contamination from adjacent land areas erodes, the radionuclide concentrations within this land parcel are potentially to increase over time. However, there is insufficient data to derive dose estimates for contamination in such a case. It is recommended that controls be implemented to minimize the spread of contamination from the muckpiles into uncontaminated areas and to prevent further contamination of CAS 12-25-02.

8.4 Residual Radioactive Material Guidelines for CAS 12-25-02

The sum of the ratios for CAS 12-25-02 did not exceed unity. Residual radioactive guidelines for mixtures of radionuclides were not calculated for this CAS. Table 8-2, presents the calculations results for deriving guidelines for single radionuclides for this CAS. The residual radioactive material guidelines for single radionuclides are listed in Table 7-3, Residual Radioactive Material Guidelines for Single Radionuclides and Radionuclide Mixtures. The FALs for the CAS 12-25-02 scenario are the residual radioactive material guideline values for single radionuclides

**Table 8-1. Maximum Dose Contributions for CAS 12-25-02 Using Scenario B
(occurs at t=0)(mrem/yr)**

Radionuclide	Ground		Inhalation		Soil		Total	
	Annual Dose	Fraction	Annual Dose	Fraction	Annual Dose	Fraction	Annual Dose	Fraction
Cesium-137	1.862E+00	0.9932	1.396E-05	0.0000	6.723E-04	0.0004	1.862E+00	0.9936
Plutonium-239	9.341E-06	0.0000	9.646E-03	0.0051	2.443E-03	0.0013	1.208E-02	0.0064
Total	1.862E+00	0.9932	9.646E-03	0.0051	3.115E-03	0.0017	1.874E+00	1.0000

Table 8-2. CAU 383 CAS 12-25-02 Sum of Fractions and Proportional Scaling

Radionuclide	Initial Radionuclide Concentration (pCi/g)	Contribution	Single Radionuclide Guidelines (pCi/g)	Ratio for Single Radionuclide Guideline
Cesium-137	20.5	0.95	275.2	0.07
Plutonium-239	1.04	0.05	2152	0.00
Total	21.54			0.07

Figure 8-1. CAU 383 CAS 12-25-02, Oil Spill, Scenario B: Dose Rate Per Year, All Radionuclides Summed, All Pathways Summed

Figure 8-2. CAU 383 CAS 12-25-02, Oil Spill, Scenario B: Annual Dose, All Radionuclides Summed, Component Pathways

9.0 RESRAD Calculations for CAS 12-28-02, Radioactive Material Area

This section discusses the RESRAD calculations and results for the CAS 12-28-02, Radioactive Material Area.

9.1 Selection of RESRAD Exposure Scenario

Scenario B was selected as the exposure scenario for the CAS 12-28-02 because of the remote location of the site. Because Scenario B parameters will be used for these calculations, a Use Restriction will be implemented at closure that will state the use scenario and the requirement for an occupant agency or entity to re-evaluate the closure if site use changes to fit the parameters of Scenario A.

9.2 User Input Parameters

The RESRAD default parameters that were altered for the calculations in this report and the site-specific values entered are presented in Table 7-1 RESRAD Parameters Input Values for CAU 383. A complete list of the RESRAD default parameters and the parameters used for CAU 383 is provided in Table A.1 of Attachment A.

9.3 Radionuclide Concentrations and Dose Estimates for CAS 12-28-02

The RESRAD results for this CAS are only slightly different from the results for CAS 12-06-06. This evaluation applied the radionuclide concentrations for the muckpiles all of the areas investigated under this CAU. These land areas include both the CAS 12-06-06 and CAS 12-25-02 areas.

Uncertainty in the derivation of dose estimates and dose/source contribution ratios comes from the distribution of possible input parameter values, as well as uncertainty in the conceptual model used to represent the site. The pathway contributions to the total annual dose at time zero are 99.71 percent for external exposure, 0.21 percent for inhalation, and 0.09 percent for soil ingestion pathways. Therefore, uncertainties in the following parameters: Erosion rates, thickness of contaminated zone, occupancy factors, and wind speed have the greatest significance on the model predictions. This CAS is located within the CAS-12-06-06 Muckpile area. However, the migration of radionuclides from muckpile material into this CAS is not considered in the calculations. The detailed results for this RESRAD exposure scenario are provided in Exhibit 3, RESRAD Summary Report: CAU 383 CAS 12-28-02.

The maximum dose contributions and total dose/source concentration ratios for CAS 12-28-02 using Scenario B parameters have been predicted to occur at time zero. The calculated maximum dose contributions for all considered pathways are presented in Table 9-1, Maximum Dose Contributions for CAS 12-28-02 Using Scenario B and Figure 9-1. The CAU 383 CAS 12-28-02 Scenario B: Dose Rate Per Year All Radionuclides Summed, All Pathways Summed, shows that at time zero, the TEDE to industrial/construction workers for the considered pathways is 10.38 mrem/yr and that the annual dose rate drops to zero at the 300-year interval.

Figure 9-2. CAU 383 CAS 12-28-02 Scenario B: Annual Dose All Radionuclides Nuclides Summed, Component Pathways shows the breakdown of the total dose into the component pathways. Together, Table 9-1 and Figures 9-1 and 9-2 show that the dose from Cs-137 at time zero is 10.36 mrem/year and only drops to zero after the 300-year time interval. This result also shows that the annual dose from external radiation (almost all from Cs-137) at time zero is 10.35 mrem/year and is reduced to zero mrem/yr within 300 years.

Because Cs-137 has a half-life of 30 years, the concentration of CS-137 at this site will not decay to a minute level through the radioactive decay processes within the 300-year time interval. As a best management practice, site remediation or controls that reduce worker exposures and minimize the spread of radioactive contamination into uncontaminated areas is recommended for this site.

9.4 Residual Radioactive Material Guidelines for CAS 12-28-02

The sum of the ratios for CAS 12-28-02 did not exceed unity. Residual radioactive guidelines for mixtures of radionuclides were not calculated for this CAS. Table 9-2, presents the calculation results for deriving guidelines for single radionuclides for this CAS. The residual radioactive material guidelines for single radionuclides are listed in Table 7-3, Residual Radioactive Material Guidelines for Single Radionuclides and Radionuclide Mixtures. The FALs for the CAS 12-28-02 scenario are the residual radioactive material guideline values for single radionuclides.

Table 9-1. Maximum Dose Contributions for CAS 12-28-02 Using Scenario B (occurs at t=0)(mrem/yr)

Radionuclide	Ground		Inhalation		Soil		Total	
	Annual Dose	Fraction	Annual Dose	Fraction	Annual Dose	Fraction	Annual Dose	Fraction
Cesium-137	1.035E+01	0.9971	7.761E-05	0.0000	3.739E-03	0.0004	1.036E+01	0.9974
Plutonium-238	1.202E-06	0.0000	1.956E-03	0.0002	4.906E-04	0.0000	2.447E-03	0.0002
Plutonium-239	1.877E-05	0.0000	1.936E-02	0.0019	4.909E-03	0.0005	2.428E-02	0.0023
Total	1.035E+01	0.9971	2.139E-02	0.0021	9.138E-03	0.0009	1.038E+01	1.0000

Table 9-2. CAU 383 CAS 12-28-02 Sum of Fractions and Proportional Scaling

Radionuclide	Initial Radionuclide Concentration (pCi/g)	Contribution	Single Radionuclide Guidelines (pCi/g)	Ratio for Single Radionuclide Guideline
Cesium-137	114	0.98	275.2	0.41
Plutonium-238	0.23	0.00	2370	0.00
Plutonium-239	2.09	0.02	2152	0.00
Total	116.32			0.41

Figure 9-1. CAU 383 CAS 12-28-02, Radioactive Material Area, Scenario B: Dose Per Year, All Radionuclides Summed, All Pathways Summed

Figure 9-2. CAU 383 CAS 12-28-02, Radioactive Material Area, Scenario B: Annual Dose, All Radionuclides Summed, Component Pathways

References:

AEC, see Atomic Energy Commission.

ARL, see Air Resources Laboratory.

Air Resources Laboratory. 2005. "Climatological Information and Data." As accessed at <http://www.sord.nv.doe.gov>.

Atomic Energy Commission. 1958. "Press Release, Subject: 2,000 Pounds of Conventional High Explosives will be Detonated Within the Next Few Days in a Chamber Leading Off the Tunnel in Which the Rainier Deep Underground Event," NTA Accession Number NV0323213. Las Vegas, NV: Nuclear Testing Archive.

CFR, see *Code of Federal Regulations*.

Code of Federal Regulations. 2003a. Title 40 CFR Parts 260 - 282, "Hazardous Waste Management." Washington, DC: U.S. Government Printing Office.

Code of Federal Regulations. 2003b. Title 40 CFR 761, "Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce and Prohibitions." Washington, DC: U.S. Government Printing Office.

Defense Threat Reduction Agency. 2003. *Corrective Action Investigation Plan for Corrective Action Unit 383: Area 12 E-Tunnel Sites, Nevada Test Site, Nevada*, Rev. 0, DOE/NV--939. Las Vegas, NV.

DOE, see U.S. Department of Energy.

DOE/NV, see U.S. Department of Energy, Nevada Operations Office.

EPA, see U.S. Environmental Protection Agency.

Holmes & Narver. 1959a. *Operation Hardtack, Phase II Completion Report*, July. Prepared for the U.S. Atomic Energy Commission. Las Vegas, NV.

Holmes & Narver. 1959b. Engineering drawing entitled, "Generator Station Plot Plan." Los Angeles, CA.

Holmes & Narver, Inc. 1966. Aerial photograph N-53_009 showing Area 12 U12b-Tunnel, 24 September. Mercury, NV: Archives and Records Center.

Lawrence, A., Office of Environmental Policy & Guidance. 2002. Memorandum to Distribution entitled, "Radiation Risk Estimation from Total Effective Dose Equivalents (TEDEs)," (EH-412-2002-1), 9 August.

NCRP, see National Council on Radiation Protection and Measurements.

NDEP, see Nevada Division of Environmental Protection.

NNSA/NV, see U.S. Department of Energy, National Nuclear Security Administration Nevada Operations Office.

National Council on Radiation Protection and Measurements. 1999. *Recommended Screening Limits for Contaminated Surface Soil and Review of Factors Relevant to Site-Specific Studies/National Council on Radiation Protection and Measurements*, NCRP Report No. 129. Bethesda, MD.

Nevada Division of Environmental Protection. 2004. *Review of Industrial Sites Project Document "Guidance for Calculating Industrial Sites Project Remediation Goals for Radionuclides in Soil Using the Residual Radiation (RESRAD) Computer Code."*

U.S. Department of Energy. 1993. *Radiation Protection of the Public and the Environment*, DOE 5400.5. Washington, DC.

U.S. Department of Energy. 2002. *Draft Implementation Guide, Control and Release of Property with Residual Radioactive Material, for use with DOE 5400.5, Radiation Protection of the Public and the Environment, DOE G 441.1-XX*. Washington, DC.

U.S. Department of Energy, Nevada Operation Office. 1996. *Final Environmental Impact Statement for the Nevada Test Site and Off-Site Locations in the State of Nevada*, DOE/EIS 0243. Las Vegas, NV.

U.S. Department of Energy, Nevada Operations Office. 1998. *Nevada Test Site Resource Management Plan*. DOE/NV--518, Las Vegas, NV.

U.S. Environmental Protection Agency. 1991. *Human Health Evaluation Manual Supplemental Guidance: "Standard Default Exposure Factors."* OSWER Directive 9285.6-03.

U.S. Environmental Protection Agency. 1992. *Guidance on Risk Managers and Risk Assessors*. Memorandum from F.H. Habicht, Deputy Administrator, Washington, D.C.

U.S. Environmental Protection Agency. 2000a. *Data Quality Objectives Process for Hazardous Waste Site Investigations*, EPA QA/G-4HW. Washington, D.C.

U.S. Environmental Protection Agency. 2000b. *Guidance for the Data Quality Objectives Process*, EPA QA/G-4. Washington, DC.

U.S. Environmental Protection Agency. 2002a. *Guidance for Quality Assurance Project Plans*, EPA QA/G-5, EPA/240/R-02/009. Washington, D.C.

U.S. Environmental Protection Agency. 2002b. *Guidance on Choosing a Sampling Design for Environmental Data Collection*, EPA QA/G-5S. Washington, D.C.

Yu C., Loureiro C., Cheng C. C., Jones L. G., Wang Y. Y., Chia Y. P., and Faillace E. 1993. *Data Collection Handbook To Support Modeling the Impacts of Radioactive Material in Soil*, ANL/EAIS-8. Chicago, IL: Environmental Assessment Division, Argonne National Laboratory.

Yu C., A.J. Zielen, J.J. Cheng, D.J. LePoire., E. Gnanapragasam, S. Kamboj, J. Arnish, A. Wallo III, W.A. Williams, and H. Peterson. 2001. *User's Manual for RESRAD Version 6*, ANL/EAD-4, Argonne National Laboratory, Environmental Assessment Division, Argonne, IL.

Attachment A

RESRAD Parameters Used for Analysis of CAU 383 Sites

The parametric values used in the RESRAD code for the analysis of the CAU 383 site are listed in Table A.1. Some parameters are site specific, while other values are default RESRAD values. The dose conversion factors used for inhalation and ingestion were the default FGR 13 morbidity values and correspond to the guidance and recommendations per the August 9, 2002, memorandum from A. Lawrence, Office of Environmental Policy & Guidance, to Distribution, titled “Radiation Risk Estimation from Total Effective Dose Equivalents (TEDEs)” (EH-412-2002-1) (Lawrence, 2002).

Table A.1 RESRAD Parameters (Page 1 of 6)

Parameter	Units	CAU 383	Defaults	Reference/Rationale
R011 Contaminated Zone				
Area of CZ	m ²	1.00E+02	1.000E+04	10x10 m hot spot
Thickness of CZ	m	1.200E+00	2.000E+00	Maximum depth from contaminated samples
Length Parallel to Aquifer Flow	m	not used	1.000E+02	Not Used
Radiation Dose Limit	mrem/yr	2.5E+001	2.5E+001	RESRAD Default (Yu, et al., 1993)
Elapsed Time Since Placement of Material	yr	0.0	0.0	RESRAD Default
R012 Initial Principal Radionuclide				
Principal radionuclides	pCi/g	See Table 7.2	0.0	Site-specific

Table A.1 RESRAD Parameters (Page 2 of 6)

Parameter	Units	CAU 383	Defaults	Reference/Rationale
R013 Cover and Contaminated Zone Hydrological Data				
Cover Depth	m	0.0	0.0	No Cover Assumed
Density of Cover Material	g/cm ³	not used	1.5	No Cover Assumed
Cover Depth Erosion Rate	m/yr	not used	1.000E-03	No Cover Assumed
Density of Contaminated Zone	g/cm ³	1.5	1.5	RESRAD Default
Contamination Zone Erosion Rate	m/yr	1.000E-03	1.000E-03	RESRAD Default
Contaminated Zone Total Porosity	-	4.000E-01	4.000E-01	RESRAD Default
Contaminated Zone Field Capacity	-	2.000E-01	2.000E-01	RESRAD Default
Contaminated Zone Hydraulic Conductivity	m/yr	1.000E+01	1.000E+01	RESRAD Default
Contaminated Zone b Parameter	-	5.300E+00	5.300E+00	RESRAD Default
Average Annual Wind Speed	m/sec	3.4	2.000E+00	Data from Air Resource Laboratory (2005)
Humidity in Air	g/m ³	not used	8.000E+00	Not used
Evapotranspiration Coefficient	-	5.000E-01	5.000E-01	RESRAD Default
Precipitation	m/yr	3.260E-01	1.000E+00	Data from Air Resources Laboratory
Irrigation	m/yr	2.000E-01	2.000E-01	RESRAD Default
Irrigation Mode	-	overhead	overhead	RESRAD Default
Runoff Coefficient	-	4.000E-01	2.000E-01	Open Sandy Loam 30% impervious Table 10.1 (Yu, et al., 1993)
Watershed Area for Nearby Stream or Pond	m ²	not used	1.000E+06	Not used
Accuracy for Water/Soil Computations	-	not used	1.000E-03	Not used

Table A.1 RESRAD Parameters (Page 3 of 6)

Parameter	Units	CAU 383	Defaults	Reference/Rationale
R014 Saturated Zone Hydrological Data				
Density of Saturated Zone	g/cm ³	not used	1.500E+00	Not used
Saturated Zone Total Porosity	-	not used	4.000E-01	Not used
Saturated Zone Effective Porosity	-	not used	2.000E-01	Not used
Saturated Zone Field Capacity	-	not used	2.000E-01	Not used
Saturated Zone Hydraulic Conductivity	m/yr	not used	1.000E+02	Not used
Saturated Zone Hydraulic Gradient	-	not used	2.000E-02	Not used
Saturated Zone b Parameter	-	not used	5.300E+00	Not used
Water Table Drop Rate	m/yr	not used	1.000E-03	Not used
Well Pump Intake Depth	m	not used	1.000E+01	Not used
Model: Nondispersion or Mass-Balance	-	not used	ND	Not used
Well Pumping Rate	m ³ /yr	not used	2.500E+02	Not used
R015 Uncontaminated and Unsaturated Strata Hydrological Data				
Number of Unsaturated Zone Strata	-	not used	1	Not used
Thickness	m	not used	4.000E+00	Not used
Soil Density	g/cm ³	not used	1.500E+00	Not used
Total Porosity	-	not used	4.000E-01	Not used
Effective Porosity	-	not used	2.000E-01	Not used
Field Capacity	-	not used	2.000E-01	Not used
Soil-specific b Parameter	-	not used	5.300E+00	Not used
Hydraulic Conductivity	m/yr	not used	1.000E+01	Not used

Table A.1 RESRAD Parameters (Page 4 of 6)

Parameter	Units	CAU 383	Defaults	Reference/Rationale
R016 Distribution Coefficients and Leach Rates				
Contaminated Zone K_d (all Zones)	cm ³ /g			RESRAD Default
Saturated Leach Rate	/yr	0.0	0.0	Not used
Solubility Constant	-	0.0	0.0	Not used
R017 Inhalation and External Gamma				
Inhalation Rate	m ³ /yr	1.230E+04	8.400E+03	RESRAD Default and for an individual performing outdoor activities, a typical activity mix can consist of 37% at a moderate activity level, 28% at both resting and light activity levels, and 7% at a heavy activity level, which results in a 1.4 m ³ /h (12,300 m ³ /yr) inhalation rate. (Yu, et al., 1993)
Mass Loading for Inhalation	g/m ³	6.00E-04	1E-04	The estimated mass loading for construction activities. (Yu, et al., 1993)
Exposure Duration	yr	25	30	Standard for Industrial/Commercial Scenario
Shielding Factor Inhalation	-	1.0	0.4	Assumes no indoor time fraction
Shielding Factor External Gamma	-	1.0	0.7	Assumes no indoor time fraction
Fraction of Time Spent Indoors	-	0.0	0.5	Assumes no indoor time fraction
Fraction of Time Spent Outdoors	-	0.038	0.25	Scenario specific based on Industrial/Commercial Use Scenarios for standard occupancy and low occupancy.
Shape Factor	-	1.0	1.0	RESRAD Default
R018 Ingestion Pathway Data, Dietary Parameters				
Fruits, Vegetables, and Grain Consumption	kg/yr	not used	1.600E+02	Not used
Leafy Vegetable Consumption	kg/yr	not used	1.400E+01	Not used
Milk Consumption	L/yr	not used	9.200E+01	Not used
Meat and Poultry Consumption	kg/yr	not used	6.300E+01	Not used

Table A.1 RESRAD Parameters (Page 5 of 6)

Parameter	Units	CAU 383	Defaults	Reference/Rationale
Fish Consumption	kg/yr	not used	5.400E+00	Not used
Other Seafood Consumption	kg/yr	not used	9.000E-01	Not used
Soil Ingestion Rate	g/yr	1.752E+02	36.5	EPA, 1991; 480 mg/day
Drinking Water Intake	L/yr	not used	5.100E+02	Not used
Drinking Water Contaminated Fraction	-	not used	1.000E+00	Not used
Household Water Contaminated Fraction	-	not used	1.000E+00	Not used
Livestock Water Contaminated Fraction	-	not used	1.000E+00	Not used
Irrigation Water Contaminated Fraction	-	not used	1.000E+00	Not used
Aquatic Food Contamination Fraction	-	not used	5.000E-01	Not used
Plant Food Contamination Fraction	-	not used	-1	Not used
Meat Contamination Fraction	-	not used	-1	Not used
Milk Contamination Fraction	-	not used	-1	Not used
R019 Ingestion Pathway Data, Nondietary				
Livestock Fodder Intake for Meat	kg/day	not used	6.800E+01	Not used
Livestock Fodder Intake for Milk	kg/day	not used	5.500E+01	Not used
Livestock Water Intake for Meat	L/day	not used	5.000E+01	Not used
Livestock Water Intake for Milk	L/day	not used	1.600E+02	Not used
Livestock Soil Intake	kg/day	not used	5.000E-01	Not used
Mass Loading for Foliar Deposition	g/m ³	not used	1.000E-04	Not used
Depth of Soil Mixing Layer	m	1.500E-01	1.500E-01	RESRAD Default
Depth of Roots	m	not used	9.000E-01	Not used

Table A.1 RESRAD Parameters (Page 6 of 6)

Parameter	Units	CAU 383	Defaults	Reference/Rationale
Drinking Water Fraction from Groundwater	-	not used	1.000E+00	Not used
Household Water Fraction from Groundwater	-	not used	1.000E+00	Not used
Livestock Water Fraction from Groundwater	-	not used	1.000E+00	Not used
Irrigation Fraction from Groundwater	-	not used	1.000E+00	Not used
R021 Radon				
Radon Parameters Not Used			Not used	

cm^3/g = Cubic centimeters per gram
 g/cm^3 = Grams per cubic centimeter
 g/m^3 = Grams per cubic meter
 g/yr = Grams per year
 kg/day = Kilograms per day
 kg/yr = Kilograms per year
 L/day = Liters per day
 L/yr = Liters per year
 m = Meter
 m^2 = Square meter
 m/sec = Meters per second

m/yr = Meters per year
 m^3/h = Cubic meters per hour
 m^3/yr = Cubic meters per year
 mg/day = Milligrams per day
 mrem/yr = Millirem per year
 N/A = Not applicable
 pCi/g = Picocuries per gram
 yr = Year
 $/\text{yr}$ = Per year
 UCL = Upper confidence level

Exhibit 1

RESRAD Summary Report: CAU 383 CAS 12-06-06

Muck: 27 Pages
Drainage: 26 pages
Ponds: 26 Pages

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Part I: Mixture Sums and Single Radionuclide Guidelines

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Time = 0.000E+00	14
Time = 1.000E+00	15
Time = 3.000E+00	16
Time = 1.000E+01	17
Time = 3.000E+01	18
Time = 5.000E+01	19
Time = 7.500E+01	20
Time = 1.000E+02	21
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Dose Conversion Factor (and Related) Parameter Summary
File: FGR 13 MORBIDITY

0	3	3	3	3	3	3
Menu	Parameter	Value	Case*	Base	Parameter	Name
AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
B-1	Dose conversion factors for inhalation, mrem/pCi:					
B-1	Ac-227+D	6.724E+00	6.700E+00	DCF2(1)		
B-1	Am-241	4.440E-01	4.440E-01	DCF2(2)		
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2(3)		
B-1	Eu-152	2.210E-04	2.210E-04	DCF2(4)		
B-1	Gd-152	2.430E-01	2.430E-01	DCF2(6)		
B-1	Np-237+D	5.400E-01	5.400E-01	DCF2(7)		
B-1	Pa-231	1.280E+00	1.280E+00	DCF2(8)		
B-1	Pb-210+D	2.320E-02	1.360E-02	DCF2(9)		
B-1	Pu-238	3.920E-01	3.920E-01	DCF2(10)		
B-1	Pu-239	4.290E-01	4.290E-01	DCF2(12)		
B-1	Ra-226+D	8.594E-03	8.580E-03	DCF2(13)		
B-1	Sr-90+D	1.308E-03	1.300E-03	DCF2(14)		
B-1	Th-229+D	2.169E+00	2.150E+00	DCF2(15)		
B-1	Th-230	3.260E-01	3.260E-01	DCF2(16)		
B-1	U-233	1.350E-01	1.350E-01	DCF2(17)		
B-1	U-234	1.320E-01	1.320E-01	DCF2(18)		
B-1	U-235+D	1.230E-01	1.230E-01	DCF2(19)		
D-1	Dose conversion factors for ingestion, mrem/pCi:					
D-1	Ac-227+D	1.480E-02	1.410E-02	DCF3(1)		
D-1	Am-241	3.640E-03	3.640E-03	DCF3(2)		
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3(3)		
D-1	Eu-152	6.480E-06	6.480E-06	DCF3(4)		
D-1	Gd-152	1.610E-04	1.610E-04	DCF3(6)		
D-1	Np-237+D	4.444E-03	4.440E-03	DCF3(7)		
D-1	Pa-231	1.060E-02	1.060E-02	DCF3(8)		
D-1	Pb-210+D	7.276E-03	5.370E-03	DCF3(9)		
D-1	Pu-238	3.200E-03	3.200E-03	DCF3(10)		
D-1	Pu-239	3.540E-03	3.540E-03	DCF3(12)		
D-1	Ra-226+D	1.321E-03	1.320E-03	DCF3(13)		
D-1	Sr-90+D	1.528E-04	1.420E-04	DCF3(14)		
D-1	Th-229+D	4.027E-03	3.530E-03	DCF3(15)		
D-1	Th-230	5.480E-04	5.480E-04	DCF3(16)		
D-1	U-233	2.890E-04	2.890E-04	DCF3(17)		
D-1	U-234	2.830E-04	2.830E-04	DCF3(18)		
D-1	U-235+D	2.673E-04	2.660E-04	DCF3(19)		
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	Am-241 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(2,1)		
D-34	Am-241 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-05	5.000E-05	RTF(2,2)		
D-34	Am-241 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(2,3)		
D-34	Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(3,1)		
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(3,2)		
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(3,3)		
D-34						

Uncontrolled When Printed

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

0	3		3	Current	3	Base	3	Parameter
Menu	3	Parameter	3	Value	3	Case*	3	Name
AAAAA	3		3		3		3	AAAAA
D-34	3	Eu-152 , plant/soil concentration ratio, dimensionless	3	2.500E-03	3	2.500E-03	3	RTF(4,1)
D-34	3	Eu-152 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3	2.000E-03	3	2.000E-03	3	RTF(4,2)
D-34	3	Eu-152 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3	5.000E-05	3	5.000E-05	3	RTF(4,3)
D-34	3		3		3		3	
D-34	3	Gd-152 , plant/soil concentration ratio, dimensionless	3	2.500E-03	3	2.500E-03	3	RTF(6,1)
D-34	3	Gd-152 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3	2.000E-03	3	2.000E-03	3	RTF(6,2)
D-34	3	Gd-152 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3	2.000E-05	3	2.000E-05	3	RTF(6,3)
D-34	3		3		3		3	
D-34	3	Np-237+D , plant/soil concentration ratio, dimensionless	3	2.000E-02	3	2.000E-02	3	RTF(7,1)
D-34	3	Np-237+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3	1.000E-03	3	1.000E-03	3	RTF(7,2)
D-34	3	Np-237+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3	5.000E-06	3	5.000E-06	3	RTF(7,3)
D-34	3		3		3		3	
D-34	3	Pa-231 , plant/soil concentration ratio, dimensionless	3	1.000E-02	3	1.000E-02	3	RTF(8,1)
D-34	3	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3	5.000E-03	3	5.000E-03	3	RTF(8,2)
D-34	3	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3	5.000E-06	3	5.000E-06	3	RTF(8,3)
D-34	3		3		3		3	
D-34	3	Pb-210+D , plant/soil concentration ratio, dimensionless	3	1.000E-02	3	1.000E-02	3	RTF(9,1)
D-34	3	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3	8.000E-04	3	8.000E-04	3	RTF(9,2)
D-34	3	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3	3.000E-04	3	3.000E-04	3	RTF(9,3)
D-34	3		3		3		3	
D-34	3	Pu-238 , plant/soil concentration ratio, dimensionless	3	1.000E-03	3	1.000E-03	3	RTF(10,1)
D-34	3	Pu-238 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3	1.000E-04	3	1.000E-04	3	RTF(10,2)
D-34	3	Pu-238 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3	1.000E-06	3	1.000E-06	3	RTF(10,3)
D-34	3		3		3		3	
D-34	3	Pu-239 , plant/soil concentration ratio, dimensionless	3	1.000E-03	3	1.000E-03	3	RTF(12,1)
D-34	3	Pu-239 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3	1.000E-04	3	1.000E-04	3	RTF(12,2)
D-34	3	Pu-239 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3	1.000E-06	3	1.000E-06	3	RTF(12,3)
D-34	3		3		3		3	
D-34	3	Ra-226+D , plant/soil concentration ratio, dimensionless	3	4.000E-02	3	4.000E-02	3	RTF(13,1)
D-34	3	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3	1.000E-03	3	1.000E-03	3	RTF(13,2)
D-34	3	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3	1.000E-03	3	1.000E-03	3	RTF(13,3)
D-34	3		3		3		3	
D-34	3	Sr-90+D , plant/soil concentration ratio, dimensionless	3	3.000E-01	3	3.000E-01	3	RTF(14,1)
D-34	3	Sr-90+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3	8.000E-03	3	8.000E-03	3	RTF(14,2)
D-34	3	Sr-90+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3	2.000E-03	3	2.000E-03	3	RTF(14,3)
D-34	3		3		3		3	
D-34	3	Th-229+D , plant/soil concentration ratio, dimensionless	3	1.000E-03	3	1.000E-03	3	RTF(15,1)
D-34	3	Th-229+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3	1.000E-04	3	1.000E-04	3	RTF(15,2)
D-34	3	Th-229+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3	5.000E-06	3	5.000E-06	3	RTF(15,3)
D-34	3		3		3		3	
D-34	3	Th-230 , plant/soil concentration ratio, dimensionless	3	1.000E-03	3	1.000E-03	3	RTF(16,1)
D-34	3	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3	1.000E-04	3	1.000E-04	3	RTF(16,2)
D-34	3	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3	5.000E-06	3	5.000E-06	3	RTF(16,3)
D-34	3		3		3		3	
D-34	3	U-233 , plant/soil concentration ratio, dimensionless	3	2.500E-03	3	2.500E-03	3	RTF(17,1)
D-34	3	U-233 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3	3.400E-04	3	3.400E-04	3	RTF(17,2)
D-34	3	U-233 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3	6.000E-04	3	6.000E-04	3	RTF(17,3)
D-34	3		3		3		3	
D-34	3	U-234 , plant/soil concentration ratio, dimensionless	3	2.500E-03	3	2.500E-03	3	RTF(18,1)
D-34	3	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3	3.400E-04	3	3.400E-04	3	RTF(18,2)
D-34	3	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3	6.000E-04	3	6.000E-04	3	RTF(18,3)

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Dose Conversion Factor (and Related) Parameter Summary (continued)

File: FGR 13 MORBIDITY

0	3		3	Current	3	Base	3	Parameter
Menu	3	Parameter	3	Value	3	Case*	3	Name
AAAAA	3	AAAAA	3	AAAAA	3	AAAAA	3	AAAAA
D-34	3	U-235+D , plant/soil concentration ratio, dimensionless	3	2.500E-03	3	2.500E-03	3	RTF(19,1)
D-34	3	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3	3.400E-04	3	3.400E-04	3	RTF(19,2)
D-34	3	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3	6.000E-04	3	6.000E-04	3	RTF(19,3)
D-5	3	Bioaccumulation factors, fresh water, L/kg:	3		3		3	
D-5	3	Ac-227+D , fish	3	1.500E+01	3	1.500E+01	3	BIOFAC(1,1)
D-5	3	Ac-227+D , crustacea and mollusks	3	1.000E+03	3	1.000E+03	3	BIOFAC(1,2)
D-5	3		3		3		3	
D-5	3	Am-241 , fish	3	3.000E+01	3	3.000E+01	3	BIOFAC(2,1)
D-5	3	Am-241 , crustacea and mollusks	3	1.000E+03	3	1.000E+03	3	BIOFAC(2,2)
D-5	3		3		3		3	
D-5	3	Cs-137+D , fish	3	2.000E+03	3	2.000E+03	3	BIOFAC(3,1)
D-5	3	Cs-137+D , crustacea and mollusks	3	1.000E+02	3	1.000E+02	3	BIOFAC(3,2)
D-5	3		3		3		3	
D-5	3	Eu-152 , fish	3	5.000E+01	3	5.000E+01	3	BIOFAC(4,1)
D-5	3	Eu-152 , crustacea and mollusks	3	1.000E+03	3	1.000E+03	3	BIOFAC(4,2)
D-5	3		3		3		3	
D-5	3	Gd-152 , fish	3	2.500E+01	3	2.500E+01	3	BIOFAC(6,1)
D-5	3	Gd-152 , crustacea and mollusks	3	1.000E+03	3	1.000E+03	3	BIOFAC(6,2)
D-5	3		3		3		3	
D-5	3	Np-237+D , fish	3	3.000E+01	3	3.000E+01	3	BIOFAC(7,1)
D-5	3	Np-237+D , crustacea and mollusks	3	4.000E+02	3	4.000E+02	3	BIOFAC(7,2)
D-5	3		3		3		3	
D-5	3	Pa-231 , fish	3	1.000E+01	3	1.000E+01	3	BIOFAC(8,1)
D-5	3	Pa-231 , crustacea and mollusks	3	1.100E+02	3	1.100E+02	3	BIOFAC(8,2)
D-5	3		3		3		3	
D-5	3	Pb-210+D , fish	3	3.000E+02	3	3.000E+02	3	BIOFAC(9,1)
D-5	3	Pb-210+D , crustacea and mollusks	3	1.000E+02	3	1.000E+02	3	BIOFAC(9,2)
D-5	3		3		3		3	
D-5	3	Pu-238 , fish	3	3.000E+01	3	3.000E+01	3	BIOFAC(10,1)
D-5	3	Pu-238 , crustacea and mollusks	3	1.000E+02	3	1.000E+02	3	BIOFAC(10,2)
D-5	3		3		3		3	
D-5	3	Pu-239 , fish	3	3.000E+01	3	3.000E+01	3	BIOFAC(12,1)
D-5	3	Pu-239 , crustacea and mollusks	3	1.000E+02	3	1.000E+02	3	BIOFAC(12,2)
D-5	3		3		3		3	
D-5	3	Ra-226+D , fish	3	5.000E+01	3	5.000E+01	3	BIOFAC(13,1)
D-5	3	Ra-226+D , crustacea and mollusks	3	2.500E+02	3	2.500E+02	3	BIOFAC(13,2)
D-5	3		3		3		3	
D-5	3	Sr-90+D , fish	3	6.000E+01	3	6.000E+01	3	BIOFAC(14,1)
D-5	3	Sr-90+D , crustacea and mollusks	3	1.000E+02	3	1.000E+02	3	BIOFAC(14,2)
D-5	3		3		3		3	
D-5	3	Th-229+D , fish	3	1.000E+02	3	1.000E+02	3	BIOFAC(15,1)
D-5	3	Th-229+D , crustacea and mollusks	3	5.000E+02	3	5.000E+02	3	BIOFAC(15,2)
D-5	3		3		3		3	
D-5	3	Th-230 , fish	3	1.000E+02	3	1.000E+02	3	BIOFAC(16,1)
D-5	3	Th-230 , crustacea and mollusks	3	5.000E+02	3	5.000E+02	3	BIOFAC(16,2)
D-5	3		3		3		3	
D-5	3	U-233 , fish	3	1.000E+01	3	1.000E+01	3	BIOFAC(17,1)
D-5	3	U-233 , crustacea and mollusks	3	6.000E+01	3	6.000E+01	3	BIOFAC(17,2)
D-5	3		3		3		3	

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Dose Conversion Factor (and Related) Parameter Summary (continued)

File: FGR 13 MORBIDITY

0	Menu	Parameter	Current Value	Base Case*	Parameter Name
	D-5	U-234, fish	1.000E+01	1.000E+01	BIOFAC(18,1)
	D-5	U-234, crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(18,2)
	D-5	U-235+D, fish	1.000E+01	1.000E+01	BIOFAC(19,1)
	D-5	U-235+D, crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(19,2)
	*Base Case means Default.Lib w/o Associate Nuclide contributions.				

Uncontrolled When Printed

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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 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 Am-241				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(2)
R016	Unsat. zone 1 (cm**3/g)	not used	2.000E+01	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	not used	2.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.153E-02	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	4.600E+03	4.600E+03	---	DCNUCC(3)
R016	Unsat. zone 1 (cm**3/g)	not used	4.600E+03	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	not used	4.600E+03	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.449E-05	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for Eu-152				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCC(4)
R016	Unsat. zone 1 (cm**3/g)	not used	-1.000E+00	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	not used	-1.000E+00	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.268E-04	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)
R016	Distribution coefficients for Pu-238				
R016	Contaminated zone (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCC(10)
R016	Unsat. zone 1 (cm**3/g)	not used	2.000E+03	---	DCNUCU(10,1)
R016	Saturated zone (cm**3/g)	not used	2.000E+03	---	DCNUCS(10)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.173E-04	ALEACH(10)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(10)
R016	Distribution coefficients for Pu-239				
R016	Contaminated zone (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCC(12)
R016	Unsat. zone 1 (cm**3/g)	not used	2.000E+03	---	DCNUCU(12,1)
R016	Saturated zone (cm**3/g)	not used	2.000E+03	---	DCNUCS(12)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.173E-04	ALEACH(12)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(12)

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Site-Specific Parameter Summary (continued)					
Menu	Parameter	User Input	Default	Used by RESRAD	Parameter Name
AAAAAA					
R016	Distribution coefficients for Sr-90				
R016	Contaminated zone (cm**3/g)	3.000E+01	3.000E+01	---	DCNUCC(14)
R016	Unsaturated zone 1 (cm**3/g)	not used	3.000E+01	---	DCNUCU(14,1)
R016	Saturated zone (cm**3/g)	not used	3.000E+01	---	DCNUCS(14)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.440E-02	ALEACH(14)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(14)
R016	Distribution coefficients for daughter Ac-227				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	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	2.153E-02	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for daughter Gd-152				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCC(6)
R016	Unsaturated zone 1 (cm**3/g)	not used	-1.000E+00	---	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	not used	-1.000E+00	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.268E-04	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R016	Distribution coefficients for daughter Np-237				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCC(7)
R016	Unsaturated zone 1 (cm**3/g)	not used	-1.000E+00	---	DCNUCU(7,1)
R016	Saturated zone (cm**3/g)	not used	-1.000E+00	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.687E-03	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for daughter Pa-231				
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	8.660E-03	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC(9)
R016	Unsaturated zone 1 (cm**3/g)	not used	1.000E+02	---	DCNUCU(9,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS(9)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.338E-03	ALEACH(9)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(9)
R016	Distribution coefficients for daughter Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(13)
R016	Unsaturated zone 1 (cm**3/g)	not used	7.000E+01	---	DCNUCU(13,1)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(13)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	6.193E-03	ALEACH(13)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(13)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
Distribution coefficients for daughter Th-229					
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(15)
R016	Unsaturated zone 1 (cm**3/g)	not used	6.000E+04	---	DCNUCU(15,1)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(15)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.244E-06	ALEACH(15)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(15)
Distribution coefficients for daughter Th-230					
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(16)
R016	Unsaturated zone 1 (cm**3/g)	not used	6.000E+04	---	DCNUCU(16,1)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(16)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.244E-06	ALEACH(16)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(16)
Distribution coefficients for daughter U-233					
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(17)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(17,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(17)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.660E-03	ALEACH(17)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(17)
Distribution coefficients for daughter U-234					
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(18)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(18,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(18)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.660E-03	ALEACH(18)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(18)
Distribution coefficients for daughter U-235					
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(19)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(19,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(19)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.660E-03	ALEACH(19)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(19)
R017	Inhalation rate (m**3/yr)	1.230E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	6.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	2.500E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	1.000E+00	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)	3.800E-02	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS

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Site-Specific Parameter Summary (continued)					
Menu	Parameter	User Input	Default	Used by RESRAD	Parameter Name
AAAAAA					
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	1.752E+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

Uncontrolled When Printed

Site-Specific Parameter Summary (continued)

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

Uncontrolled When Printed

Site-Specific Parameter Summary (continued)

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

Summary of Pathway Selections

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

Contaminated Zone Dimensions	Initial Soil Concentrations, pCi/g
AAAAAAAAAAAAAAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAAAAAAAAAAAAAA
Area: 100.00 square meters	Am-241 2.880E+01
Thickness: 0.15 meters	Cs-137 1.060E+03
Cover Depth: 0.00 meters	Eu-152 2.640E+00
	Pu-238 1.560E+01
	Pu-239 8.400E+01
	Sr-90 3.410E+01

0

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)

AAAAAAAAAAAAAAAAAAAAAAAAAAAA

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	5.000E+01	7.500E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	9.831E+01	9.577E+01	9.087E+01	7.555E+01	4.421E+01	2.541E+01	1.220E+01	5.352E+00	0.000E+00	0.000E+00
M(t):	3.933E+00	3.831E+00	3.635E+00	3.022E+00	1.768E+00	1.017E+00	4.881E-01	2.141E-01	0.000E+00	0.000E+00

0Maximum TDOSE(t): 9.831E+01 mrem/yr at t = 0.000E+00 years

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

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA
Am-241	3.935E-02	0.0004	2.729E-01	0.0028	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.876E-02	0.0007
Cs-137	9.626E+01	0.9791	7.217E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.476E-02	0.0004
Eu-152	4.688E-01	0.0048	1.227E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.106E-05	0.0000
Pu-238	8.080E-05	0.0000	1.315E-01	0.0013	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.299E-02	0.0003
Pu-239	7.545E-04	0.0000	7.780E-01	0.0079	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.973E-01	0.0020
Sr-90	2.338E-02	0.0002	9.452E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.392E-03	0.0000
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
Total	9.679E+01	0.9845	1.184E+00	0.0120	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.372E-01	0.0034

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

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.810E-01	0.0039
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.630E+01	0.9795
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.688E-01	0.0048
Pu-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	1.646E-01	0.0017
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.760E-01	0.0099
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.772E-02	0.0003
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
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	9.831E+01	1.0000

0*Sum of all water independent and dependent pathways.

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

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA
Am-241	3.845E-02	0.0004	2.649E-01	0.0028	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.674E-02	0.0007
Cs-137	9.376E+01	0.9791	7.004E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.374E-02	0.0004
Eu-152	4.433E-01	0.0046	1.157E-05	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	0.0000
Pu-238	8.014E-05	0.0000	1.296E-01	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.250E-02	0.0003
Pu-239	7.530E-04	0.0000	7.726E-01	0.0081	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.959E-01	0.0020
Sr-90	2.244E-02	0.0002	9.037E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.243E-03	0.0000
iiiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii
Total	9.427E+01	0.9843	1.169E+00	0.0122	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.322E-01	0.0035

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

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.701E-01	0.0039
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.380E+01	0.9794
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.433E-01	0.0046
Pu-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	1.621E-01	0.0017
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.692E-01	0.0101
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.659E-02	0.0003
iiiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii
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	9.577E+01	1.0000

0*Sum of all water independent and dependent pathways.

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

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	3.671E-02	0.0004	2.495E-01	0.0027	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.287E-02	0.0007
Cs-137	8.895E+01	0.9789	6.597E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.178E-02	0.0003
Eu-152	3.963E-01	0.0044	1.027E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.257E-06	0.0000
Pu-238	7.884E-05	0.0000	1.258E-01	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.155E-02	0.0003
Pu-239	7.499E-04	0.0000	7.618E-01	0.0084	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.932E-01	0.0021
Sr-90	2.068E-02	0.0002	8.259E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.964E-03	0.0000
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
Total	8.941E+01	0.9839	1.139E+00	0.0125	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.223E-01	0.0035

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

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.491E-01	0.0038
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.899E+01	0.9793
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.964E-01	0.0044
Pu-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	1.574E-01	0.0017
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.557E-01	0.0105
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.447E-02	0.0003
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
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	9.087E+01	1.0000

0*Sum of all water independent and dependent pathways.

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

0														
0														
	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.	
	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	
	Am-241	3.122E-02	0.0004	2.021E-01	0.0027	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.091E-02 0.0007
	Cs-137	7.390E+01	0.9782	5.340E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.572E-02 0.0003
	Eu-152	2.676E-01	0.0035	6.772E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.103E-06 0.0000
	Pu-238	7.443E-05	0.0000	1.131E-01	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.838E-02 0.0004
	Pu-239	7.389E-04	0.0000	7.241E-01	0.0096	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.836E-01 0.0024
	Sr-90	1.553E-02	0.0002	6.019E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.160E-03 0.0000
	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii
	Total	7.422E+01	0.9824	1.040E+00	0.0138	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.908E-01 0.0038

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

0														
0														
	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.	
	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	
	Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.842E-01 0.0038
	Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.393E+01 0.9786
	Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.676E-01 0.0035
	Pu-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	1.416E-01 0.0019
	Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.085E-01 0.0120
	Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.829E-02 0.0002
	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii
	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	7.555E+01 1.0000

0*Sum of all water independent and dependent pathways.

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

0														
0	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	1.963E-02	0.0004	1.090E-01	0.0025	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.746E-02	0.0006
Cs-137	4.307E+01	0.9742	2.876E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.385E-02	0.0003
Eu-152	8.615E-02	0.0019	2.029E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.828E-06	0.0000
Pu-238	6.306E-05	0.0000	8.240E-02	0.0019	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.067E-02	0.0005
Pu-239	7.037E-04	0.0000	6.173E-01	0.0140	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.565E-01	0.0035
Sr-90	6.789E-03	0.0002	2.402E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.620E-04	0.0000
iiiiiiii	iiiiiiiiiiii	iiiiiiii	iiiiiiiiiiii	iiiiiiii	iiiiiiiiiiii	iiiiiiii	iiiiiiiiiiii	iiiiiiii	iiiiiiiiiiii	iiiiiiii	iiiiiiiiiiii	iiiiiiii	iiiiiiiiiiii	iiiiiiii
Total	4.318E+01	0.9767	8.092E-01	0.0183	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.194E-01	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

0														
0	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.561E-01	0.0035
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.308E+01	0.9745
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.615E-02	0.0019
Pu-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	1.031E-01	0.0023
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.745E-01	0.0175
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.891E-03	0.0002
iiiiiiii	iiiiiiiiiiii	iiiiiiii	iiiiiiiiiiii	iiiiiiii	iiiiiiiiiiii	iiiiiiii	iiiiiiiiiiii	iiiiiiii	iiiiiiiiiiii	iiiiiiii	iiiiiiiiiiii	iiiiiiii	iiiiiiiiiiii	iiiiiiii
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	4.421E+01	1.0000

0*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 5.000E+01 years
Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Am-241	1.231E-02	0.0005	5.714E-02	0.0022	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.440E-02	0.0006
Cs-137	2.458E+01	0.9671	1.506E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.253E-03	0.0003
Eu-152	2.715E-02	0.0011	5.909E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.325E-07	0.0000
Pu-238	5.328E-05	0.0000	5.833E-02	0.0023	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.463E-02	0.0006
Pu-239	6.612E-04	0.0000	5.114E-01	0.0201	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.297E-01	0.0051
Sr-90	2.914E-03	0.0001	9.315E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.343E-04	0.0000
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
Total	2.462E+01	0.9688	6.271E-01	0.0247	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.663E-01	0.0065

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 5.000E+01 years
Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.384E-02	0.0033
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.458E+01	0.9674
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.715E-02	0.0011
Pu-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	7.301E-02	0.0029
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.418E-01	0.0253
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.341E-03	0.0001
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
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	2.541E+01	1.0000

0*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 7.500E+01 years
Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Am-241	6.791E-03	0.0006	2.399E-02	0.0020	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.045E-03	0.0005
Cs-137	1.163E+01	0.9533	6.313E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.041E-03	0.0002
Eu-152	6.124E-03	0.0005	1.190E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.072E-07	0.0000
Pu-238	4.281E-05	0.0000	3.565E-02	0.0029	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.944E-03	0.0007
Pu-239	5.923E-04	0.0000	3.806E-01	0.0312	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.652E-02	0.0079
Sr-90	9.704E-04	0.0001	2.684E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.632E-05	0.0000
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
Total	1.165E+01	0.9545	4.403E-01	0.0361	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.146E-01	0.0094

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 7.500E+01 years
Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.683E-02	0.0030
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.164E+01	0.9536
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.124E-03	0.0005
Pu-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	4.464E-02	0.0037
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.777E-01	0.0391
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.094E-03	0.0001
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
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	1.220E+01	1.0000

0*Sum of all water independent and dependent pathways.

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

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA
Am-241	3.588E-03	0.0007	8.942E-03	0.0017	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.253E-03	0.0004
Cs-137	4.994E+00	0.9332	2.348E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.131E-03	0.0002
Eu-152	1.258E-03	0.0002	2.127E-08	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	0.0000
Pu-238	3.375E-05	0.0000	1.934E-02	0.0036	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.851E-03	0.0009
Pu-239	4.946E-04	0.0001	2.513E-01	0.0470	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.373E-02	0.0119
Sr-90	2.950E-04	0.0001	6.862E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.463E-05	0.0000
iiiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii
Total	5.000E+00	0.9343	2.796E-01	0.0523	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.199E-02	0.0135

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

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.478E-02	0.0028
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.996E+00	0.9335
Eu-152	0.000E+00	0.0000	0.000E+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	0.0002
Pu-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	2.422E-02	0.0045
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.156E-01	0.0590
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.265E-04	0.0001
iiiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii
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	5.352E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0														
0														
	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.	
	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	
	Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	
	Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	
	Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	
	Pu-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	
	Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	
	Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	
	iiiiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	
	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	

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

0														
0														
	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.	
	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	
	Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	
	Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	
	Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	
	Pu-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	
	Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	
	Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	
	iiiiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	
	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	

0*Sum of all water independent and dependent pathways.

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

0														
0														
	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.	
	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	
	Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	
	Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	
	Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	
	Pu-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	
	Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	
	Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	
	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	
	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	

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

0														
0														
	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.	
	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	
	Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	
	Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	
	Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	
	Pu-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	
	Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	
	Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	
	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	
	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	

0*Sum of all water independent and dependent pathways.

Dose/Source Ratios Summed Over All Pathways													
Parent and Progeny Principal Radionuclide Contributions Indicated													
0	Parent	Product	Thread	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g)									
	(i)	(j)	Fraction	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	5.000E+01	7.500E+01	1.000E+02	3.000E+02	1.000E+03
	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA
	Am-241	Am-241	1.000E+00	1.323E-02	1.285E-02	1.212E-02	9.868E-03	5.419E-03	2.911E-03	1.279E-03	5.130E-04	0.000E+00	0.000E+00
	Am-241	Np-237+D	1.000E+00	7.497E-09	2.217E-08	5.013E-08	1.345E-07	2.840E-07	3.406E-07	3.326E-07	2.689E-07	0.000E+00	0.000E+00
	Am-241	U-233	1.000E+00	7.360E-16	5.074E-15	2.591E-14	2.045E-13	1.193E-12	2.218E-12	2.902E-12	2.705E-12	0.000E+00	0.000E+00
	Am-241	Th-229+D	1.000E+00	5.229E-19	7.756E-18	8.824E-17	2.135E-15	3.988E-14	1.362E-13	3.072E-13	4.483E-13	0.000E+00	0.000E+00
	Am-241	äDSR(j)		1.323E-02	1.285E-02	1.212E-02	9.868E-03	5.419E-03	2.911E-03	1.279E-03	5.133E-04	0.000E+00	0.000E+00
	OCs-137+D	Cs-137+D	1.000E+00	9.085E-02	8.849E-02	8.395E-02	6.975E-02	4.064E-02	2.319E-02	1.098E-02	4.713E-03	0.000E+00	0.000E+00
	OEu-152	Eu-152	7.208E-01	1.280E-01	1.210E-01	1.082E-01	7.306E-02	2.352E-02	7.414E-03	1.672E-03	3.434E-04	0.000E+00	0.000E+00
	OEu-152	Eu-152	2.792E-01	4.958E-02	4.688E-02	4.192E-02	2.830E-02	9.111E-03	2.872E-03	6.477E-04	1.330E-04	0.000E+00	0.000E+00
	Eu-152	Gd-152	2.792E-01	4.708E-18	1.371E-17	3.000E-17	7.201E-17	1.154E-16	1.109E-16	8.660E-17	5.762E-17	0.000E+00	0.000E+00
	Eu-152	äDSR(j)		4.958E-02	4.688E-02	4.192E-02	2.830E-02	9.111E-03	2.872E-03	6.477E-04	1.330E-04	0.000E+00	0.000E+00
	OPu-238	Pu-238	1.840E-09	1.941E-11	1.913E-11	1.856E-11	1.670E-11	1.216E-11	8.611E-12	5.265E-12	2.857E-12	0.000E+00	0.000E+00
	OPu-238	Pu-238	1.000E+00	1.055E-02	1.039E-02	1.009E-02	9.077E-03	6.611E-03	4.680E-03	2.861E-03	1.553E-03	0.000E+00	0.000E+00
	Pu-238	U-234	1.000E+00	4.295E-09	1.271E-08	2.880E-08	7.760E-08	1.634E-07	1.906E-07	1.733E-07	1.246E-07	0.000E+00	0.000E+00
	Pu-238	Th-230	1.000E+00	3.146E-14	2.179E-13	1.125E-12	9.219E-12	5.968E-11	1.223E-10	1.794E-10	1.858E-10	0.000E+00	0.000E+00
	Pu-238	Ra-226+D	1.000E+00	1.298E-16	1.932E-15	2.213E-14	5.489E-13	1.096E-11	3.975E-11	9.598E-11	1.491E-10	0.000E+00	0.000E+00
	Pu-238	Pb-210+D	1.000E+00	1.561E-20	4.763E-19	1.159E-17	7.973E-16	3.885E-14	1.969E-13	5.743E-13	9.526E-13	0.000E+00	0.000E+00
	Pu-238	äDSR(j)		1.055E-02	1.039E-02	1.009E-02	9.077E-03	6.611E-03	4.680E-03	2.861E-03	1.553E-03	0.000E+00	0.000E+00
	OPu-239	Pu-239	1.000E+00	1.162E-02	1.154E-02	1.138E-02	1.082E-02	9.220E-03	7.640E-03	5.687E-03	3.757E-03	0.000E+00	0.000E+00
	Pu-239	U-235+D	1.000E+00	1.257E-11	3.748E-11	8.626E-11	2.464E-10	6.186E-10	8.727E-10	1.030E-09	9.901E-10	0.000E+00	0.000E+00
	Pu-239	Pa-231	1.000E+00	1.387E-16	9.613E-16	4.963E-15	4.078E-14	2.660E-13	5.506E-13	8.215E-13	8.717E-13	0.000E+00	0.000E+00
	Pu-239	Ac-227+D	1.000E+00	5.801E-18	8.531E-17	9.522E-16	2.153E-14	3.362E-13	9.777E-13	1.838E-12	2.264E-12	0.000E+00	0.000E+00
	Pu-239	äDSR(j)		1.162E-02	1.154E-02	1.138E-02	1.082E-02	9.220E-03	7.640E-03	5.687E-03	3.757E-03	0.000E+00	0.000E+00
	OSr-90+D	Sr-90+D	1.000E+00	8.128E-04	7.798E-04	7.177E-04	5.365E-04	2.314E-04	9.799E-05	3.207E-05	9.574E-06	0.000E+00	0.000E+00
	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí

The DSR includes contributions from associated (half-life ó 180 days) daughters.

0

Single Radionuclide Soil Guidelines G(i,t) in pCi/g

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

0Nuclide	(i)	t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	5.000E+01	7.500E+01	1.000E+02	3.000E+02	1.000E+03
	AAAAAA		AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
	Am-241		1.890E+03	1.945E+03	2.063E+03	2.533E+03	4.613E+03	8.587E+03	1.955E+04	4.870E+04	*3.431E+12	*3.431E+12
	Cs-137		2.752E+02	2.825E+02	2.978E+02	3.584E+02	6.151E+02	1.078E+03	2.277E+03	5.305E+03	*8.704E+13	*8.704E+13
	Eu-152		1.408E+02	1.489E+02	1.665E+02	2.467E+02	7.661E+02	2.431E+03	1.078E+04	5.247E+04	*1.765E+14	*1.765E+14
	Pu-238		2.370E+03	2.405E+03	2.478E+03	2.754E+03	3.782E+03	5.342E+03	8.737E+03	1.610E+04	*1.712E+13	*1.712E+13
	Pu-239		2.152E+03	2.167E+03	2.197E+03	2.311E+03	2.711E+03	3.272E+03	4.396E+03	6.655E+03	*6.214E+10	*6.214E+10
	Sr-90		3.076E+04	3.206E+04	3.483E+04	4.660E+04	1.080E+05	2.551E+05	7.795E+05	2.611E+06	*1.365E+14	*1.365E+14
	íííííííííí		íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí

*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

0Nuclide	Initial	tmin	DSR(i,tmin)	G(i,tmin)	DSR(i,tmax)	G(i,tmax)
(i)	(pCi/g)	(years)	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)
Am-241	2.880E+01	0.000E+00	1.323E-02	1.890E+03	1.323E-02	1.890E+03
Cs-137	1.060E+03	0.000E+00	9.085E-02	2.752E+02	9.085E-02	2.752E+02
Eu-152	2.640E+00	0.000E+00	1.776E-01	1.408E+02	1.776E-01	1.408E+02
Pu-238	1.560E+01	0.000E+00	1.055E-02	2.370E+03	1.055E-02	2.370E+03
Pu-239	8.400E+01	0.000E+00	1.162E-02	2.152E+03	1.162E-02	2.152E+03
Sr-90	3.410E+01	0.000E+00	8.128E-04	3.076E+04	8.128E-04	3.076E+04

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

0Nuclide	Parent	THF(i)	DOSE(j,t), mrem/yr											
(j)	(i)		t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	5.000E+01	7.500E+01	1.000E+02	3.000E+02	1.000E+03	
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Am-241	Am-241	1.000E+00	3.810E-01	3.701E-01	3.491E-01	2.842E-01	1.561E-01	8.383E-02	3.682E-02	1.478E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ONp-237	Am-241	1.000E+00	2.159E-07	6.385E-07	1.444E-06	3.873E-06	8.179E-06	9.809E-06	9.579E-06	7.744E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-233	Am-241	1.000E+00	2.120E-14	1.461E-13	7.461E-13	5.890E-12	3.437E-11	6.387E-11	8.359E-11	7.790E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0Th-229	Am-241	1.000E+00	1.506E-17	2.234E-16	2.541E-15	6.149E-14	1.148E-12	3.922E-12	8.848E-12	1.291E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OCs-137	Cs-137	1.000E+00	9.630E+01	9.380E+01	8.899E+01	7.393E+01	4.308E+01	2.458E+01	1.164E+01	4.996E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0Eu-152	Eu-152	7.208E-01	3.379E-01	3.195E-01	2.857E-01	1.929E-01	6.210E-02	1.957E-02	4.414E-03	9.067E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Eu-152	Eu-152	2.792E-01	1.309E-01	1.238E-01	1.107E-01	7.471E-02	2.405E-02	7.582E-03	1.710E-03	3.512E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Eu-152	äDOSE(j)		4.688E-01	4.433E-01	3.964E-01	2.676E-01	8.615E-02	2.715E-02	6.124E-03	1.258E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OGd-152	Eu-152	2.792E-01	1.243E-17	3.621E-17	7.921E-17	1.901E-16	3.046E-16	2.928E-16	2.286E-16	1.521E-16	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OPu-238	Pu-238	1.840E-09	3.028E-10	2.984E-10	2.896E-10	2.605E-10	1.898E-10	1.343E-10	8.213E-11	4.457E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-238	Pu-238	1.000E+00	1.646E-01	1.621E-01	1.574E-01	1.416E-01	1.031E-01	7.301E-02	4.463E-02	2.422E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-238	äDOSE(j)		1.646E-01	1.621E-01	1.574E-01	1.416E-01	1.031E-01	7.301E-02	4.463E-02	2.422E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-234	Pu-238	1.000E+00	6.701E-08	1.983E-07	4.492E-07	1.211E-06	2.549E-06	2.974E-06	2.703E-06	1.943E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0Th-230	Pu-238	1.000E+00	4.908E-13	3.399E-12	1.754E-11	1.438E-10	9.310E-10	1.908E-09	2.799E-09	2.898E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ORa-226	Pu-238	1.000E+00	2.026E-15	3.014E-14	3.453E-13	8.562E-12	1.709E-10	6.201E-10	1.497E-09	2.327E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OPb-210	Pu-238	1.000E+00	2.435E-19	7.430E-18	1.808E-16	1.244E-14	6.060E-13	3.071E-12	8.959E-12	1.486E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OPu-239	Pu-239	1.000E+00	9.760E-01	9.692E-01	9.557E-01	9.085E-01	7.745E-01	6.418E-01	4.777E-01	3.156E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	Pu-239	1.000E+00	1.056E-09	3.148E-09	7.246E-09	2.070E-08	5.196E-08	7.330E-08	8.649E-08	8.317E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OPa-231	Pu-239	1.000E+00	1.165E-14	8.075E-14	4.169E-13	3.425E-12	2.234E-11	4.625E-11	6.901E-11	7.322E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0Ac-227	Pu-239	1.000E+00	4.873E-16	7.166E-15	7.998E-14	1.809E-12	2.824E-11	8.213E-11	1.544E-10	1.902E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OSr-90	Sr-90	1.000E+00	2.772E-02	2.659E-02	2.447E-02	1.829E-02	7.891E-03	3.341E-03	1.094E-03	3.265E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00
iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii

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

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

ONuclide	Parent	THF(i)	S(j,t), pCi/g										
(j)	(i)		t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	5.000E+01	7.500E+01	1.000E+02	3.000E+02	1.000E+03
AAAAAAA	AAAAAAA	AAAAAAA		AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA
Am-241	Am-241	1.000E+00		2.880E+01	2.814E+01	2.687E+01	2.285E+01	1.439E+01	9.059E+00	5.081E+00	2.849E+00	2.789E-02	2.588E-09
ONp-237	Am-241	1.000E+00		0.000E+00	9.213E-06	2.697E-05	8.255E-05	1.962E-04	2.630E-04	3.065E-04	3.244E-04	2.618E-04	8.046E-05
OU-233	Am-241	1.000E+00		0.000E+00	2.017E-11	1.775E-10	1.826E-09	1.325E-08	2.990E-08	5.242E-08	7.341E-08	1.344E-07	5.036E-08
OTh-229	Am-241	1.000E+00		0.000E+00	6.367E-16	1.691E-14	5.908E-13	1.357E-11	5.380E-11	1.508E-10	2.992E-10	2.492E-09	8.124E-09
OCs-137	Cs-137	1.000E+00		1.060E+03	1.036E+03	9.887E+02	8.405E+02	5.285E+02	3.323E+02	1.861E+02	1.042E+02	1.006E+00	8.911E-08
OEu-152	Eu-152	7.208E-01		1.903E+00	1.806E+00	1.625E+00	1.125E+00	3.936E-01	1.377E-01	3.703E-02	9.960E-03	2.728E-07	2.936E-23
Eu-152	Eu-152	2.792E-01		7.371E-01	6.994E-01	6.296E-01	4.359E-01	1.525E-01	5.333E-02	1.434E-02	3.858E-03	1.057E-07	1.137E-23
Eu-152	âS(j):			2.640E+00	2.505E+00	2.255E+00	1.561E+00	5.461E-01	1.910E-01	5.137E-02	1.382E-02	3.785E-07	4.073E-23
OGd-152	Eu-152	2.792E-01		0.000E+00	4.607E-15	1.312E-14	3.669E-14	7.073E-14	8.203E-14	8.568E-14	8.583E-14	7.768E-14	5.372E-14
OPu-238	Pu-238	1.840E-09		2.870E-08	2.847E-08	2.801E-08	2.647E-08	2.250E-08	1.913E-08	1.562E-08	1.275E-08	2.514E-09	8.563E-12
Pu-238	Pu-238	1.000E+00		1.560E+01	1.547E+01	1.522E+01	1.438E+01	1.223E+01	1.040E+01	8.486E+00	6.928E+00	1.366E+00	4.654E-03
Pu-238	âS(j):			1.560E+01	1.547E+01	1.522E+01	1.438E+01	1.223E+01	1.040E+01	8.486E+00	6.928E+00	1.366E+00	4.654E-03
OU-234	Pu-238	1.000E+00		0.000E+00	4.386E-05	1.294E-04	4.067E-04	1.032E-03	1.454E-03	1.768E-03	1.911E-03	1.072E-03	1.017E-05
OTh-230	Pu-238	1.000E+00		0.000E+00	1.979E-10	1.762E-09	1.883E-08	1.517E-07	3.780E-07	7.441E-07	1.160E-06	4.042E-06	5.579E-06
ORa-226	Pu-238	1.000E+00		0.000E+00	2.858E-14	7.626E-13	2.711E-11	6.518E-10	2.689E-09	7.871E-09	1.620E-08	1.509E-07	3.598E-07
OPb-210	Pu-238	1.000E+00		0.000E+00	2.208E-16	1.747E-14	1.988E-12	1.285E-10	7.978E-10	3.113E-09	7.670E-09	1.137E-07	3.147E-07
OPu-239	Pu-239	1.000E+00		8.400E+01	8.398E+01	8.394E+01	8.379E+01	8.338E+01	8.297E+01	8.246E+01	8.196E+01	7.802E+01	6.567E+01
OU-235	Pu-239	1.000E+00		0.000E+00	8.236E-08	2.449E-07	7.915E-07	2.177E-06	3.335E-06	4.517E-06	5.457E-06	8.400E-06	7.685E-06
OPa-231	Pu-239	1.000E+00		0.000E+00	8.701E-13	7.740E-12	8.255E-11	6.618E-10	1.640E-09	3.208E-09	4.970E-09	1.645E-08	1.924E-08
OAc-227	Pu-239	1.000E+00		0.000E+00	9.124E-15	2.379E-13	7.811E-12	1.527E-10	5.263E-10	1.268E-09	2.211E-09	9.377E-09	1.153E-08
OSr-90	Sr-90	1.000E+00		3.410E+01	3.282E+01	3.041E+01	2.327E+01	1.084E+01	5.049E+00	1.943E+00	7.477E-01	3.594E-04	8.756E-16
iiiiiii	iiiiiii	iiiiiii		iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii

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

ORESCALC.EXE execution time = 1.48 seconds

AÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ

Part I: Mixture Sums and Single Radionuclide Guidelines

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Time = 0.000E+00	13
Time = 1.000E+00	14
Time = 3.000E+00	15
Time = 1.000E+01	16
Time = 3.000E+01	17
Time = 5.000E+01	18
Time = 7.500E+01	19
Time = 1.000E+02	20
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Dose Conversion Factor (and Related) Parameter Summary
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0	3	3	3	3	3	3
Menu	Parameter	Current Value	Base Case*	Parameter Name		
AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
B-1	Dose conversion factors for inhalation, mrem/pCi:					
B-1	Ac-227+D	6.724E+00	6.700E+00	DCF2(1)		
B-1	Am-241	4.440E-01	4.440E-01	DCF2(2)		
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2(3)		
B-1	Np-237+D	5.400E-01	5.400E-01	DCF2(4)		
B-1	Pa-231	1.280E+00	1.280E+00	DCF2(5)		
B-1	Pb-210+D	2.320E-02	1.360E-02	DCF2(6)		
B-1	Pu-238	3.920E-01	3.920E-01	DCF2(7)		
B-1	Pu-239	4.290E-01	4.290E-01	DCF2(9)		
B-1	Ra-226+D	8.594E-03	8.580E-03	DCF2(10)		
B-1	Sr-90+D	1.308E-03	1.300E-03	DCF2(11)		
B-1	Th-229+D	2.169E+00	2.150E+00	DCF2(12)		
B-1	Th-230	3.260E-01	3.260E-01	DCF2(13)		
B-1	U-233	1.350E-01	1.350E-01	DCF2(14)		
B-1	U-234	1.320E-01	1.320E-01	DCF2(15)		
B-1	U-235+D	1.230E-01	1.230E-01	DCF2(16)		
D-1	Dose conversion factors for ingestion, mrem/pCi:					
D-1	Ac-227+D	1.480E-02	1.410E-02	DCF3(1)		
D-1	Am-241	3.640E-03	3.640E-03	DCF3(2)		
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3(3)		
D-1	Np-237+D	4.444E-03	4.440E-03	DCF3(4)		
D-1	Pa-231	1.060E-02	1.060E-02	DCF3(5)		
D-1	Pb-210+D	7.276E-03	5.370E-03	DCF3(6)		
D-1	Pu-238	3.200E-03	3.200E-03	DCF3(7)		
D-1	Pu-239	3.540E-03	3.540E-03	DCF3(9)		
D-1	Ra-226+D	1.321E-03	1.320E-03	DCF3(10)		
D-1	Sr-90+D	1.528E-04	1.420E-04	DCF3(11)		
D-1	Th-229+D	4.027E-03	3.530E-03	DCF3(12)		
D-1	Th-230	5.480E-04	5.480E-04	DCF3(13)		
D-1	U-233	2.890E-04	2.890E-04	DCF3(14)		
D-1	U-234	2.830E-04	2.830E-04	DCF3(15)		
D-1	U-235+D	2.673E-04	2.660E-04	DCF3(16)		
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	Am-241 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(2,1)		
D-34	Am-241 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-05	5.000E-05	RTF(2,2)		
D-34	Am-241 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(2,3)		
D-34	Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(3,1)		
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(3,2)		
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(3,3)		
D-34	Np-237+D , plant/soil concentration ratio, dimensionless	2.000E-02	2.000E-02	RTF(4,1)		
D-34	Np-237+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(4,2)		
D-34	Np-237+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(4,3)		
D-34						

Uncontrolled When Printed

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

Menu	Parameter	Current Value	Base Case*	Parameter Name
D-34	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(5,1)
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(5,2)
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(5,3)
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(6,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(6,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(6,3)
D-34	Pu-238 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(7,1)
D-34	Pu-238 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(7,2)
D-34	Pu-238 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(7,3)
D-34	Pu-239 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(9,1)
D-34	Pu-239 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(9,2)
D-34	Pu-239 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(9,3)
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(10,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(10,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(10,3)
D-34	Sr-90+D , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF(11,1)
D-34	Sr-90+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-03	8.000E-03	RTF(11,2)
D-34	Sr-90+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(11,3)
D-34	Th-229+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(12,1)
D-34	Th-229+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(12,2)
D-34	Th-229+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(12,3)
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(13,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(13,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(13,3)
D-34	U-233 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(14,1)
D-34	U-233 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(14,2)
D-34	U-233 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(14,3)
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(15,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(15,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(15,3)
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(16,1)
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(16,2)
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(16,3)
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	Am-241 , fish	3.000E+01	3.000E+01	BIOFAC(2,1)
D-5	Am-241 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(2,2)

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

Menu	Parameter	Current Value	Base Case*	Parameter Name
D-5	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC(3,1)
D-5	Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(3,2)
D-5	Np-237+D , fish	3.000E+01	3.000E+01	BIOFAC(4,1)
D-5	Np-237+D , crustacea and mollusks	4.000E+02	4.000E+02	BIOFAC(4,2)
D-5	Pa-231 , fish	1.000E+01	1.000E+01	BIOFAC(5,1)
D-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(5,2)
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(6,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(6,2)
D-5	Pu-238 , fish	3.000E+01	3.000E+01	BIOFAC(7,1)
D-5	Pu-238 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(7,2)
D-5	Pu-239 , fish	3.000E+01	3.000E+01	BIOFAC(9,1)
D-5	Pu-239 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(9,2)
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(10,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(10,2)
D-5	Sr-90+D , fish	6.000E+01	6.000E+01	BIOFAC(11,1)
D-5	Sr-90+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(11,2)
D-5	Th-229+D , fish	1.000E+02	1.000E+02	BIOFAC(12,1)
D-5	Th-229+D , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(12,2)
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(13,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(13,2)
D-5	U-233 , fish	1.000E+01	1.000E+01	BIOFAC(14,1)
D-5	U-233 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(14,2)
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(15,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(15,2)
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIOFAC(16,1)
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(16,2)

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

Site-Specific Parameter Summary									
Menu	Parameter	User Input	Default	Used by RESRAD			Parameter Name		
(If different from user input)									
AA									

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
Distribution coefficients for daughter Ac-227					
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	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	2.153E-02	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
Distribution coefficients for daughter Np-237					
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCC(4)
R016	Unsaturated zone 1 (cm**3/g)	not used	-1.000E+00	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	not used	-1.000E+00	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.687E-03	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)
Distribution coefficients for daughter Pa-231					
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(5,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.660E-03	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
Distribution coefficients for daughter Pb-210					
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC(6)
R016	Unsaturated zone 1 (cm**3/g)	not used	1.000E+02	---	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.338E-03	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
Distribution coefficients for daughter Ra-226					
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(10)
R016	Unsaturated zone 1 (cm**3/g)	not used	7.000E+01	---	DCNUCU(10,1)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(10)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	6.193E-03	ALEACH(10)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(10)
Distribution coefficients for daughter Th-229					
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(12)
R016	Unsaturated zone 1 (cm**3/g)	not used	6.000E+04	---	DCNUCU(12,1)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(12)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.244E-06	ALEACH(12)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(12)
Distribution coefficients for daughter Th-230					
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(13)
R016	Unsaturated zone 1 (cm**3/g)	not used	6.000E+04	---	DCNUCU(13,1)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(13)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.244E-06	ALEACH(13)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(13)

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Site-Specific Parameter Summary (continued)					
Menu	Parameter	User Input	Default	Used by RESRAD	Parameter Name
AAAAAA					
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)	1.752E+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)
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	---	TIV(1)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD	Parameter Name
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	---	EVSIN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSIN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
C14	DCF correction factor for gaseous forms of C14	not used	0.000E+00	---	CO2F
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX

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Site-Specific Parameter Summary (continued)

0	3	3	3	3	3	3	3
Menu	Parameter	User	Input	Default	Used by RESRAD	(If different from user input)	Parameter Name
AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
TITL	Maximum number of integration points for risk	257	---	---	---	---	KYMAX
iiiiii	iiiiii	iiiiii	iiiiii	iiiiii	iiiiii	iiiiii	iiiiii

Summary of Pathway Selections

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

Contaminated Zone Dimensions

Initial Soil Concentrations, pCi/g

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Area: 100.00 square meters

Am-241 1.880E+00

Thickness: 0.15 meters

Cs-137 2.541E+01

Cover Depth: 0.00 meters

Pu-238 2.000E-01

Pu-239 1.520E+00

Sr-90 9.700E-01

0

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)

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t (years): 0.000E+00 1.000E+00 3.000E+00 1.000E+01 3.000E+01 5.000E+01 7.500E+01 1.000E+02 3.000E+02 1.000E+03

TDOSE(t): 2.354E+00 2.293E+00 2.176E+00 1.810E+00 1.058E+00 6.074E-01 2.906E-01 1.267E-01 0.000E+00 0.000E+00

M(t): 9.415E-02 9.172E-02 8.704E-02 7.238E-02 4.234E-02 2.430E-02 1.162E-02 5.070E-03 0.000E+00 0.000E+00

0Maximum TDOSE(t): 2.354E+00 mrem/yr at t = 0.000E+00 years

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

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA
Am-241	2.569E-03	0.0011	1.782E-02	0.0076	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.489E-03	0.0019
Cs-137	2.308E+00	0.9803	1.730E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.333E-04	0.0004
Pu-238	1.036E-06	0.0000	1.686E-03	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.229E-04	0.0002
Pu-239	1.365E-05	0.0000	1.408E-02	0.0060	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.570E-03	0.0015
Sr-90	6.650E-04	0.0003	2.689E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.649E-05	0.0000
iiiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii
Total	2.311E+00	0.9817	3.362E-02	0.0143	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.411E-03	0.0040

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

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.487E-02	0.0106
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.308E+00	0.9807
Pu-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	2.110E-03	0.0009
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.766E-02	0.0075
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.884E-04	0.0003
iiiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii
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	2.354E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA
Am-241	2.510E-03	0.0011	1.729E-02	0.0075	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.357E-03	0.0019
Cs-137	2.248E+00	0.9802	1.679E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.088E-04	0.0004
Pu-238	1.027E-06	0.0000	1.661E-03	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.167E-04	0.0002
Pu-239	1.363E-05	0.0000	1.398E-02	0.0061	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.545E-03	0.0015
Sr-90	6.384E-04	0.0003	2.571E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.226E-05	0.0000
iiiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii
Total	2.251E+00	0.9816	3.298E-02	0.0144	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.220E-03	0.0040

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

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.416E-02	0.0105
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.249E+00	0.9806
Pu-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-03	0.0009
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.754E-02	0.0076
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.564E-04	0.0003
iiiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii
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	2.293E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA
Am-241	2.396E-03	0.0011	1.629E-02	0.0075	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.104E-03	0.0019
Cs-137	2.132E+00	0.9800	1.581E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.617E-04	0.0004
Pu-238	1.011E-06	0.0000	1.612E-03	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.045E-04	0.0002
Pu-239	1.357E-05	0.0000	1.378E-02	0.0063	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.496E-03	0.0016
Sr-90	5.884E-04	0.0003	2.349E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.432E-05	0.0000
iiiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii
Total	2.135E+00	0.9814	3.172E-02	0.0146	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.850E-03	0.0041

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

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.279E-02	0.0105
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.133E+00	0.9803
Pu-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	2.018E-03	0.0009
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.729E-02	0.0079
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.962E-04	0.0003
iiiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii
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	2.176E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0														
0														
	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.	
	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	
	Am-241	2.038E-03	0.0011	1.319E-02	0.0073	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.323E-03 0.0018
	Cs-137	1.772E+00	0.9790	1.280E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.166E-04 0.0003
	Pu-238	9.542E-07	0.0000	1.450E-03	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.639E-04 0.0002
	Pu-239	1.337E-05	0.0000	1.310E-02	0.0072	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.323E-03 0.0018
	Sr-90	4.418E-04	0.0002	1.712E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.145E-05 0.0000
	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii
	Total	1.774E+00	0.9804	2.777E-02	0.0153	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.688E-03 0.0042

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

0														
0														
	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.	
	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	
	Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.855E-02 0.0103
	Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.772E+00 0.9794
	Pu-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	1.815E-03 0.0010
	Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.644E-02 0.0091
	Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.204E-04 0.0003
	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii
	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	1.810E+00 1.0000

0*Sum of all water independent and dependent pathways.

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

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA
Am-241	1.282E-03	0.0012	7.115E-03	0.0067	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.793E-03	0.0017
Cs-137	1.032E+00	0.9754	6.895E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.321E-04	0.0003
Pu-238	8.085E-07	0.0000	1.056E-03	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.650E-04	0.0003
Pu-239	1.273E-05	0.0000	1.117E-02	0.0106	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.833E-03	0.0027
Sr-90	1.931E-04	0.0002	6.832E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.452E-05	0.0000
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
Total	1.034E+00	0.9768	1.935E-02	0.0183	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.247E-03	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

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.019E-02	0.0096
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.033E+00	0.9757
Pu-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	1.322E-03	0.0012
Pu-239	0.000E+00	0.0000	0.000E+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-02	0.0132
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.245E-04	0.0002
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
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	1.058E+00	1.0000

0*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 5.000E+01 years
Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	8.037E-04	0.0013	3.730E-03	0.0061	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.397E-04	0.0015
Cs-137	5.892E-01	0.9699	3.610E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.739E-04	0.0003
Pu-238	6.830E-07	0.0000	7.478E-04	0.0012	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.876E-04	0.0003
Pu-239	1.196E-05	0.0000	9.255E-03	0.0152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.347E-03	0.0039
Sr-90	8.289E-05	0.0001	2.650E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.510E-06	0.0000
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
Total	5.901E-01	0.9714	1.374E-02	0.0226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.658E-03	0.0060

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 5.000E+01 years
Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.473E-03	0.0090
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.893E-01	0.9702
Pu-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	9.360E-04	0.0015
Pu-239	0.000E+00	0.0000	0.000E+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-02	0.0191
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.505E-05	0.0002
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
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	6.074E-01	1.0000

0*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 7.500E+01 years
Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	4.433E-04	0.0015	1.566E-03	0.0054	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.946E-04	0.0014
Cs-137	2.789E-01	0.9596	1.513E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.289E-05	0.0003
Pu-238	5.488E-07	0.0000	4.571E-04	0.0016	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.147E-04	0.0004
Pu-239	1.072E-05	0.0000	6.887E-03	0.0237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.746E-03	0.0060
Sr-90	2.760E-05	0.0001	7.634E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.740E-06	0.0000
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
Total	2.793E-01	0.9613	8.912E-03	0.0307	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.331E-03	0.0080

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 7.500E+01 years
Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.404E-03	0.0083
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.789E-01	0.9599
Pu-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	5.723E-04	0.0020
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.644E-03	0.0297
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.111E-05	0.0001
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
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	2.906E-01	1.0000

0*Sum of all water independent and dependent pathways.

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

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA
Am-241	2.342E-04	0.0018	5.837E-04	0.0046	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.471E-04	0.0012
Cs-137	1.197E-01	0.9446	5.630E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.712E-05	0.0002
Pu-238	4.327E-07	0.0000	2.479E-04	0.0020	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.219E-05	0.0005
Pu-239	8.949E-06	0.0001	4.548E-03	0.0359	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.153E-03	0.0091
Sr-90	8.391E-06	0.0001	1.952E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.006E-07	0.0000
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
Total	1.200E-01	0.9466	5.380E-03	0.0424	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.390E-03	0.0110

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

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.650E-04	0.0076
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.198E-01	0.9448
Pu-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	3.105E-04	0.0025
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.710E-03	0.0450
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.287E-06	0.0001
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
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	1.267E-01	1.0000

0*Sum of all water independent and dependent pathways.

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

0														
0														
	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pu-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	0.000E+00	0.0000
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
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	0.000E+00	0.0000

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

0														
0														
	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pu-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	0.000E+00	0.0000
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
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	0.000E+00	0.0000

0*Sum of all water independent and dependent pathways.

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

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pu-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	0.000E+00	0.0000
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
iiiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii
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	0.000E+00	0.0000

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

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pu-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	0.000E+00	0.0000
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
iiiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii
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	0.000E+00	0.0000

0*Sum of all water independent and dependent pathways.

Dose/Source Ratios Summed Over All Pathways													
Parent and Progeny Principal Radionuclide Contributions Indicated													
0	Parent	Product	Thread	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g)									
	(i)	(j)	Fraction	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	5.000E+01	7.500E+01	1.000E+02	3.000E+02	1.000E+03
	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA
	Am-241	Am-241	1.000E+00	1.323E-02	1.285E-02	1.212E-02	9.868E-03	5.419E-03	2.911E-03	1.279E-03	5.130E-04	0.000E+00	0.000E+00
	Am-241	Np-237+D	1.000E+00	7.497E-09	2.217E-08	5.013E-08	1.345E-07	2.840E-07	3.406E-07	3.326E-07	2.689E-07	0.000E+00	0.000E+00
	Am-241	U-233	1.000E+00	7.360E-16	5.074E-15	2.591E-14	2.045E-13	1.193E-12	2.218E-12	2.902E-12	2.705E-12	0.000E+00	0.000E+00
	Am-241	Th-229+D	1.000E+00	5.229E-19	7.756E-18	8.824E-17	2.135E-15	3.988E-14	1.362E-13	3.072E-13	4.483E-13	0.000E+00	0.000E+00
	Am-241	äDSR(j)		1.323E-02	1.285E-02	1.212E-02	9.868E-03	5.419E-03	2.911E-03	1.279E-03	5.133E-04	0.000E+00	0.000E+00
	0Cs-137+D	Cs-137+D	1.000E+00	9.085E-02	8.849E-02	8.395E-02	6.975E-02	4.064E-02	2.319E-02	1.098E-02	4.713E-03	0.000E+00	0.000E+00
	0Pu-238	Pu-238	1.840E-09	1.941E-11	1.913E-11	1.856E-11	1.670E-11	1.216E-11	8.611E-12	5.265E-12	2.857E-12	0.000E+00	0.000E+00
	0Pu-238	Pu-238	1.000E+00	1.055E-02	1.039E-02	1.009E-02	9.077E-03	6.611E-03	4.680E-03	2.861E-03	1.553E-03	0.000E+00	0.000E+00
	Pu-238	U-234	1.000E+00	4.295E-09	1.271E-08	2.880E-08	7.760E-08	1.634E-07	1.906E-07	1.733E-07	1.246E-07	0.000E+00	0.000E+00
	Pu-238	Th-230	1.000E+00	3.146E-14	2.179E-13	1.125E-12	9.219E-12	5.968E-11	1.223E-10	1.794E-10	1.858E-10	0.000E+00	0.000E+00
	Pu-238	Ra-226+D	1.000E+00	1.298E-16	1.932E-15	2.213E-14	5.489E-13	1.096E-11	3.975E-11	9.598E-11	1.491E-10	0.000E+00	0.000E+00
	Pu-238	Pb-210+D	1.000E+00	1.561E-20	4.763E-19	1.159E-17	7.973E-16	3.885E-14	1.969E-13	5.743E-13	9.526E-13	0.000E+00	0.000E+00
	Pu-238	äDSR(j)		1.055E-02	1.039E-02	1.009E-02	9.077E-03	6.611E-03	4.680E-03	2.861E-03	1.553E-03	0.000E+00	0.000E+00
	0Pu-239	Pu-239	1.000E+00	1.162E-02	1.154E-02	1.138E-02	1.082E-02	9.220E-03	7.640E-03	5.687E-03	3.757E-03	0.000E+00	0.000E+00
	Pu-239	U-235+D	1.000E+00	1.257E-11	3.748E-11	8.626E-11	2.464E-10	6.186E-10	8.727E-10	1.030E-09	9.901E-10	0.000E+00	0.000E+00
	Pu-239	Pa-231	1.000E+00	1.387E-16	9.613E-16	4.963E-15	4.078E-14	2.660E-13	5.506E-13	8.215E-13	8.717E-13	0.000E+00	0.000E+00
	Pu-239	Ac-227+D	1.000E+00	5.801E-18	8.531E-17	9.522E-16	2.153E-14	3.362E-13	9.777E-13	1.838E-12	2.264E-12	0.000E+00	0.000E+00
	Pu-239	äDSR(j)		1.162E-02	1.154E-02	1.138E-02	1.082E-02	9.220E-03	7.640E-03	5.687E-03	3.757E-03	0.000E+00	0.000E+00
	0Sr-90+D	Sr-90+D	1.000E+00	8.128E-04	7.798E-04	7.177E-04	5.365E-04	2.314E-04	9.799E-05	3.207E-05	9.574E-06	0.000E+00	0.000E+00
	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí

The DSR includes contributions from associated (half-life ó 180 days) daughters.

0

Single Radionuclide Soil Guidelines G(i,t) in pCi/g												
Basic Radiation Dose Limit = 2.500E+01 mrem/yr												
0Nuclide	(i)	t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	5.000E+01	7.500E+01	1.000E+02	3.000E+02	1.000E+03
	AAAAAA		AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
	Am-241		1.890E+03	1.945E+03	2.063E+03	2.533E+03	4.613E+03	8.587E+03	1.955E+04	4.870E+04	*3.431E+12	*3.431E+12
	Cs-137		2.752E+02	2.825E+02	2.978E+02	3.584E+02	6.151E+02	1.078E+03	2.277E+03	5.305E+03	*8.704E+13	*8.704E+13
	Pu-238		2.370E+03	2.405E+03	2.478E+03	2.754E+03	3.782E+03	5.342E+03	8.737E+03	1.610E+04	*1.712E+13	*1.712E+13
	Pu-239		2.152E+03	2.167E+03	2.197E+03	2.311E+03	2.711E+03	3.272E+03	4.396E+03	6.655E+03	*6.214E+10	*6.214E+10
	Sr-90		3.076E+04	3.206E+04	3.483E+04	4.660E+04	1.080E+05	2.551E+05	7.795E+05	2.611E+06	*1.365E+14	*1.365E+14
	íííííííííí		íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí
	*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

0Nuclide	Initial	tmin	DSR(i,tmin)	G(i,tmin)	DSR(i,tmax)	G(i,tmax)
(i)	(pCi/g)	(years)		(pCi/g)		(pCi/g)
AAAAAA	AAAAAA	AAAAAAAAAAAA	AAAAAAAA	AAAAAAAA	AAAAAAAA	AAAAAAAA
Am-241	1.880E+00	0.000E+00	1.323E-02	1.890E+03	1.323E-02	1.890E+03
Cs-137	2.541E+01	0.000E+00	9.085E-02	2.752E+02	9.085E-02	2.752E+02
Pu-238	2.000E-01	0.000E+00	1.055E-02	2.370E+03	1.055E-02	2.370E+03
Pu-239	1.520E+00	0.000E+00	1.162E-02	2.152E+03	1.162E-02	2.152E+03
Sr-90	9.700E-01	0.000E+00	8.128E-04	3.076E+04	8.128E-04	3.076E+04
iiiiiii	iiiiiii	iiiiiiiiiiiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii

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

ONuclide	Parent	THF(i)	DOSE(j,t), mrem/yr										
(j)	(i)	t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	5.000E+01	7.500E+01	1.000E+02	3.000E+02	1.000E+03	
AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	
Am-241	Am-241	1.000E+00	2.487E-02	2.416E-02	2.279E-02	1.855E-02	1.019E-02	5.473E-03	2.404E-03	9.645E-04	0.000E+00	0.000E+00	
ONp-237	Am-241	1.000E+00	1.409E-08	4.168E-08	9.424E-08	2.528E-07	5.339E-07	6.403E-07	6.253E-07	5.055E-07	0.000E+00	0.000E+00	
OU-233	Am-241	1.000E+00	1.384E-15	9.539E-15	4.870E-14	3.845E-13	2.243E-12	4.169E-12	5.456E-12	5.085E-12	0.000E+00	0.000E+00	
0Th-229	Am-241	1.000E+00	9.830E-19	1.458E-17	1.659E-16	4.014E-15	7.497E-14	2.560E-13	5.775E-13	8.428E-13	0.000E+00	0.000E+00	
OCs-137	Cs-137	1.000E+00	2.308E+00	2.249E+00	2.133E+00	1.772E+00	1.033E+00	5.893E-01	2.789E-01	1.198E-01	0.000E+00	0.000E+00	
OPu-238	Pu-238	1.840E-09	3.882E-12	3.825E-12	3.713E-12	3.340E-12	2.433E-12	1.722E-12	1.053E-12	5.713E-13	0.000E+00	0.000E+00	
Pu-238	Pu-238	1.000E+00	2.110E-03	2.079E-03	2.018E-03	1.815E-03	1.322E-03	9.360E-04	5.722E-04	3.105E-04	0.000E+00	0.000E+00	
Pu-238	ãDOSE(j)		2.110E-03	2.079E-03	2.018E-03	1.815E-03	1.322E-03	9.360E-04	5.722E-04	3.105E-04	0.000E+00	0.000E+00	
OU-234	Pu-238	1.000E+00	8.590E-10	2.543E-09	5.759E-09	1.552E-08	3.268E-08	3.812E-08	3.466E-08	2.492E-08	0.000E+00	0.000E+00	
0Th-230	Pu-238	1.000E+00	6.292E-15	4.358E-14	2.249E-13	1.844E-12	1.194E-11	2.446E-11	3.588E-11	3.716E-11	0.000E+00	0.000E+00	
ORa-226	Pu-238	1.000E+00	2.597E-17	3.864E-16	4.427E-15	1.098E-13	2.191E-12	7.950E-12	1.920E-11	2.983E-11	0.000E+00	0.000E+00	
OPb-210	Pu-238	1.000E+00	3.122E-21	9.525E-20	2.318E-18	1.595E-16	7.769E-15	3.937E-14	1.149E-13	1.905E-13	0.000E+00	0.000E+00	
OPu-239	Pu-239	1.000E+00	1.766E-02	1.754E-02	1.729E-02	1.644E-02	1.401E-02	1.161E-02	8.644E-03	5.710E-03	0.000E+00	0.000E+00	
OU-235	Pu-239	1.000E+00	1.911E-11	5.697E-11	1.311E-10	3.746E-10	9.402E-10	1.326E-09	1.565E-09	1.505E-09	0.000E+00	0.000E+00	
OPa-231	Pu-239	1.000E+00	2.109E-16	1.461E-15	7.544E-15	6.198E-14	4.043E-13	8.369E-13	1.249E-12	1.325E-12	0.000E+00	0.000E+00	
0Ac-227	Pu-239	1.000E+00	8.817E-18	1.297E-16	1.447E-15	3.273E-14	5.110E-13	1.486E-12	2.794E-12	3.442E-12	0.000E+00	0.000E+00	
OSr-90	Sr-90	1.000E+00	7.884E-04	7.564E-04	6.962E-04	5.204E-04	2.245E-04	9.505E-05	3.111E-05	9.287E-06	0.000E+00	0.000E+00	
ffffff	ffffff	ffffff	ffffff	ffffff	ffffff	ffffff	ffffff	ffffff	ffffff	ffffff	ffffff	ffffff	
THF(i) is the thread fraction of the parent nuclide.													

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

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

ONuclide	Parent	THF(i)	S(j,t), pCi/g										
(j)	(i)		t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	5.000E+01	7.500E+01	1.000E+02	3.000E+02	1.000E+03
AAAAAAA	AAAAAAA	AAAAAAA		AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA
Am-241	Am-241	1.000E+00		1.880E+00	1.837E+00	1.754E+00	1.492E+00	9.392E-01	5.913E-01	3.316E-01	1.860E-01	1.821E-03	1.689E-10
ONp-237	Am-241	1.000E+00		0.000E+00	6.014E-07	1.760E-06	5.389E-06	1.281E-05	1.717E-05	2.001E-05	2.118E-05	1.709E-05	5.252E-06
OU-233	Am-241	1.000E+00		0.000E+00	1.317E-12	1.159E-11	1.192E-10	8.650E-10	1.952E-09	3.422E-09	4.792E-09	8.775E-09	3.287E-09
OTh-229	Am-241	1.000E+00		0.000E+00	4.156E-17	1.104E-15	3.857E-14	8.861E-13	3.512E-12	9.841E-12	1.953E-11	1.627E-10	5.303E-10
OCs-137	Cs-137	1.000E+00		2.541E+01	2.483E+01	2.370E+01	2.015E+01	1.267E+01	7.966E+00	4.460E+00	2.497E+00	2.412E-02	2.136E-09
OPu-238	Pu-238	1.840E-09		3.680E-10	3.650E-10	3.591E-10	3.393E-10	2.885E-10	2.452E-10	2.002E-10	1.634E-10	3.223E-11	1.098E-13
Pu-238	Pu-238	1.000E+00		2.000E-01	1.984E-01	1.952E-01	1.844E-01	1.568E-01	1.333E-01	1.088E-01	8.882E-02	1.752E-02	5.967E-05
Pu-238	âS(j):			2.000E-01	1.984E-01	1.952E-01	1.844E-01	1.568E-01	1.333E-01	1.088E-01	8.882E-02	1.752E-02	5.967E-05
OU-234	Pu-238	1.000E+00		0.000E+00	5.623E-07	1.659E-06	5.214E-06	1.322E-05	1.864E-05	2.267E-05	2.450E-05	1.374E-05	1.303E-07
OTh-230	Pu-238	1.000E+00		0.000E+00	2.538E-12	2.259E-11	2.414E-10	1.945E-09	4.846E-09	9.540E-09	1.488E-08	5.182E-08	7.153E-08
ORa-226	Pu-238	1.000E+00		0.000E+00	3.664E-16	9.777E-15	3.476E-13	8.356E-12	3.448E-11	1.009E-10	2.077E-10	1.935E-09	4.613E-09
OPb-210	Pu-238	1.000E+00		0.000E+00	2.830E-18	2.239E-16	2.549E-14	1.647E-12	1.023E-11	3.992E-11	9.834E-11	1.457E-09	4.035E-09
OPu-239	Pu-239	1.000E+00		1.520E+00	1.520E+00	1.519E+00	1.516E+00	1.509E+00	1.501E+00	1.492E+00	1.483E+00	1.412E+00	1.188E+00
OU-235	Pu-239	1.000E+00		0.000E+00	1.490E-09	4.431E-09	1.432E-08	3.940E-08	6.035E-08	8.174E-08	9.875E-08	1.520E-07	1.391E-07
OPa-231	Pu-239	1.000E+00		0.000E+00	1.574E-14	1.401E-13	1.494E-12	1.198E-11	2.968E-11	5.805E-11	8.993E-11	2.977E-10	3.482E-10
OAc-227	Pu-239	1.000E+00		0.000E+00	1.651E-16	4.304E-15	1.413E-13	2.764E-12	9.524E-12	2.295E-11	4.000E-11	1.697E-10	2.086E-10
OSr-90	Sr-90	1.000E+00		9.700E-01	9.336E-01	8.650E-01	6.620E-01	3.084E-01	1.436E-01	5.527E-02	2.127E-02	1.022E-05	2.491E-17
iiiiiii	iiiiiii	iiiiiii		iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii

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

ORESCALC.EXE execution time = 1.43 seconds

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[illegible]

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

0	3		3	Current	3	Base	3	Parameter
Menu	3	Parameter	3	Value	3	Case*	3	Name
AA								

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

Menu	Parameter	Current Value	Base Case*	Parameter Name
D-34	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(5,1)
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(5,2)
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(5,3)
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(6,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(6,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(6,3)
D-34	Pu-238 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(7,1)
D-34	Pu-238 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(7,2)
D-34	Pu-238 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(7,3)
D-34	Pu-239 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(9,1)
D-34	Pu-239 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(9,2)
D-34	Pu-239 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(9,3)
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(10,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(10,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(10,3)
D-34	Sr-90+D , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF(11,1)
D-34	Sr-90+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-03	8.000E-03	RTF(11,2)
D-34	Sr-90+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(11,3)
D-34	Th-229+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(12,1)
D-34	Th-229+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(12,2)
D-34	Th-229+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(12,3)
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(13,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(13,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(13,3)
D-34	U-233 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(14,1)
D-34	U-233 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(14,2)
D-34	U-233 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(14,3)
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(15,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(15,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(15,3)
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(16,1)
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(16,2)
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(16,3)
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	Am-241 , fish	3.000E+01	3.000E+01	BIOFAC(2,1)
D-5	Am-241 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(2,2)

Dose Conversion Factor (and Related) Parameter Summary (continued)

File: FGR 13 MORBIDITY

Menu	Parameter	Current Value	Base Case*	Parameter Name
D-5	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC(3,1)
D-5	Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(3,2)
D-5				
D-5	Np-237+D , fish	3.000E+01	3.000E+01	BIOFAC(4,1)
D-5	Np-237+D , crustacea and mollusks	4.000E+02	4.000E+02	BIOFAC(4,2)
D-5				
D-5	Pa-231 , fish	1.000E+01	1.000E+01	BIOFAC(5,1)
D-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(5,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(6,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(6,2)
D-5				
D-5	Pu-238 , fish	3.000E+01	3.000E+01	BIOFAC(7,1)
D-5	Pu-238 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(7,2)
D-5				
D-5	Pu-239 , fish	3.000E+01	3.000E+01	BIOFAC(9,1)
D-5	Pu-239 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(9,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(10,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(10,2)
D-5				
D-5	Sr-90+D , fish	6.000E+01	6.000E+01	BIOFAC(11,1)
D-5	Sr-90+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(11,2)
D-5				
D-5	Th-229+D , fish	1.000E+02	1.000E+02	BIOFAC(12,1)
D-5	Th-229+D , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(12,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(13,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(13,2)
D-5				
D-5	U-233 , fish	1.000E+01	1.000E+01	BIOFAC(14,1)
D-5	U-233 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(14,2)
D-5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(15,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(15,2)
D-5				
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIOFAC(16,1)
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(16,2)

*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)	1.000E+02	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	1.500E-01	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	not used	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	5.000E+01	1.000E+02	---	T(6)
R011	Times for calculations (yr)	7.500E+01	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+02	1.000E+03	---	T(8)
R011	Times for calculations (yr)	3.000E+02	0.000E+00	---	T(9)
R011	Times for calculations (yr)	1.000E+03	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Am-241	7.200E-01	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Cs-137	9.100E+01	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): Pu-238	3.610E-01	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): Pu-239	4.490E+00	0.000E+00	---	S1(9)
R012	Initial principal radionuclide (pCi/g): Sr-90	3.620E+00	0.000E+00	---	S1(11)
R012	Concentration in groundwater (pCi/L): Am-241	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): Pu-238	not used	0.000E+00	---	W1(7)
R012	Concentration in groundwater (pCi/L): Pu-239	not used	0.000E+00	---	W1(9)
R012	Concentration in groundwater (pCi/L): Sr-90	not used	0.000E+00	---	W1(11)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	3.400E+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)	3.260E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	0.000E+00	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
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

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD	Parameter Name
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 Am-241				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(2)
R016	Unsat. zone 1 (cm**3/g)	not used	2.000E+01	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	not used	2.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.153E-02	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	4.600E+03	4.600E+03	---	DCNUCC(3)
R016	Unsat. zone 1 (cm**3/g)	not used	4.600E+03	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	not used	4.600E+03	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.449E-05	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for Pu-238				
R016	Contaminated zone (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCC(7)
R016	Unsat. zone 1 (cm**3/g)	not used	2.000E+03	---	DCNUCU(7,1)
R016	Saturated zone (cm**3/g)	not used	2.000E+03	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.173E-04	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for Pu-239				
R016	Contaminated zone (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCC(9)
R016	Unsat. zone 1 (cm**3/g)	not used	2.000E+03	---	DCNUCU(9,1)
R016	Saturated zone (cm**3/g)	not used	2.000E+03	---	DCNUCS(9)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.173E-04	ALEACH(9)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(9)
R016	Distribution coefficients for Sr-90				
R016	Contaminated zone (cm**3/g)	3.000E+01	3.000E+01	---	DCNUCC(11)
R016	Unsat. zone 1 (cm**3/g)	not used	3.000E+01	---	DCNUCU(11,1)
R016	Saturated zone (cm**3/g)	not used	3.000E+01	---	DCNUCS(11)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.440E-02	ALEACH(11)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(11)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD	Parameter Name
AAAAAA					
R016	Distribution coefficients for daughter Ac-227				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	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	2.153E-02	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for daughter Np-237				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCC(4)
R016	Unsaturated zone 1 (cm**3/g)	not used	-1.000E+00	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	not used	-1.000E+00	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.687E-03	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)
R016	Distribution coefficients for daughter Pa-231				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(5,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.660E-03	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC(6)
R016	Unsaturated zone 1 (cm**3/g)	not used	1.000E+02	---	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.338E-03	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R016	Distribution coefficients for daughter Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(10)
R016	Unsaturated zone 1 (cm**3/g)	not used	7.000E+01	---	DCNUCU(10,1)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(10)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	6.193E-03	ALEACH(10)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(10)
R016	Distribution coefficients for daughter Th-229				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(12)
R016	Unsaturated zone 1 (cm**3/g)	not used	6.000E+04	---	DCNUCU(12,1)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(12)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.244E-06	ALEACH(12)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(12)
R016	Distribution coefficients for daughter Th-230				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(13)
R016	Unsaturated zone 1 (cm**3/g)	not used	6.000E+04	---	DCNUCU(13,1)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(13)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.244E-06	ALEACH(13)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(13)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD	Parameter Name
AAAAAA					
R016	Distribution coefficients for daughter U-233				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(14)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(14,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(14)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.660E-03	ALEACH(14)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(14)
R016	Distribution coefficients for daughter U-234				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(15)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(15,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(15)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.660E-03	ALEACH(15)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(15)
R016	Distribution coefficients for daughter U-235				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(16)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(16,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(16)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.660E-03	ALEACH(16)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(16)
R017	Inhalation rate (m**3/yr)	1.230E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	6.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	2.500E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	1.000E+00	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)	3.800E-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)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	(If different from user input)	Parameter Name
AAAAAA					
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)	1.752E+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)
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	---	TIV(1)

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Site-Specific Parameter Summary (continued)

Site Specific Parameter Summary (continued)					
Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
=====					
R19B	Translocation Factor for Leafy	not used	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	not used	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	not used	2.000E+01	---	WLAM
=====					
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
C14	DCF correction factor for gaseous forms of C14	not used	0.000E+00	---	CO2F
=====					
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
=====					
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
=====					
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX

Uncontrolled When Printed

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD	Parameter Name
TITL	Maximum number of integration points for risk	257	---	---	KYMAX

Summary of Pathway Selections

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

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
AAAAAAAAAAAAAAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAAAAAAAAAAAAAA	
Area:	100.00 square meters	Am-241	7.200E-01
Thickness:	0.15 meters	Cs-137	9.100E+01
Cover Depth:	0.00 meters	Pu-238	3.610E-01
		Pu-239	4.490E+00
		Sr-90	3.620E+00

0

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)											
AAAAAAAAAAAAAAAAAAAAAAAAAAAA											
t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	5.000E+01	7.500E+01	1.000E+02	3.000E+02	1.000E+03	
TDOSE(t):	8.335E+00	8.120E+00	7.705E+00	6.408E+00	3.747E+00	2.149E+00	1.027E+00	4.467E-01	0.000E+00	0.000E+00	
M(t):	3.334E-01	3.248E-01	3.082E-01	2.563E-01	1.499E-01	8.596E-02	4.106E-02	1.787E-02	0.000E+00	0.000E+00	
0Maximum TDOSE(t):	8.335E+00 mrem/yr	at t = 0.000E+00 years									

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

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

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Am-241	9.837E-04	0.0001	6.823E-03	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.719E-03	0.0002
Cs-137	8.264E+00	0.9914	6.196E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.984E-03	0.0004
Pu-238	1.870E-06	0.0000	3.043E-03	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.634E-04	0.0001
Pu-239	4.033E-05	0.0000	4.158E-02	0.0050	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.055E-02	0.0013
Sr-90	2.482E-03	0.0003	1.003E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.601E-04	0.0000
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
Total	8.267E+00	0.9918	5.161E-02	0.0062	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.637E-02	0.0020

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

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.526E-03	0.0011
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.267E+00	0.9918
Pu-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	3.808E-03	0.0005
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.217E-02	0.0063
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.942E-03	0.0004
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
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	8.335E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

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

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Am-241	9.612E-04	0.0001	6.622E-03	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.669E-03	0.0002
Cs-137	8.050E+00	0.9913	6.013E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.896E-03	0.0004
Pu-238	1.855E-06	0.0000	2.998E-03	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.522E-04	0.0001
Pu-239	4.025E-05	0.0000	4.130E-02	0.0051	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.047E-02	0.0013
Sr-90	2.383E-03	0.0003	9.593E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.443E-04	0.0000
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
Total	8.053E+00	0.9917	5.107E-02	0.0063	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.613E-02	0.0020

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

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.252E-03	0.0011
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.053E+00	0.9917
Pu-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	3.752E-03	0.0005
Pu-239	0.000E+00	0.0000	0.000E+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-02	0.0064
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.823E-03	0.0003
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
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	8.120E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

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

Water Independent Pathways (Inhalation excludes radon)

0	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
0	Radio-	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
	Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr
	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
	Am-241	9.178E-04	0.0001	6.238E-03	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.572E-03
	Cs-137	7.637E+00	0.9911	5.663E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.728E-03
	Pu-238	1.824E-06	0.0000	2.910E-03	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.301E-04
	Pu-239	4.008E-05	0.0000	4.072E-02	0.0053	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.033E-02
	Sr-90	2.196E-03	0.0003	8.768E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.147E-04
	iiiiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii
	Total	7.640E+00	0.9915	5.001E-02	0.0065	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.567E-02

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

0	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
0	Radio-	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
	Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr
	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
	Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.727E-03
	Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.639E+00
	Pu-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	3.642E-03
	Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.109E-02
	Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.598E-03
	iiiiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii
	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	7.705E+00

0*Sum of all water independent and dependent pathways.

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

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

Water Independent Pathways (Inhalation excludes radon)

Water Independent Pathways (Inhalation excludes radon)															
0	Ground			Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAA		AAAAA	AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA	
Nuclide	mrem/yr	fract.		mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAAA		AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Am-241	7.805E-04	0.0001		5.052E-03	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.273E-03	0.0002
Cs-137	6.345E+00	0.9901		4.584E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.208E-03	0.0003
Pu-238	1.722E-06	0.0000		2.618E-03	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.568E-04	0.0001
Pu-239	3.950E-05	0.0000		3.871E-02	0.0060	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.816E-03	0.0015
Sr-90	1.649E-03	0.0003		6.390E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.293E-04	0.0000
iiiiiii	iiiiiii	iiiiiii		iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
Total	6.347E+00	0.9905		4.649E-02	0.0073	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.418E-02	0.0022
0															

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

Water Dependent Pathways														
0	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAAAAAAAAAAA		AAAAAAAAAAAAAA		AAAAAAAAAAAAAA		AAAAAAAAAAAAAA		AAAAAAAAAAAAAA		AAAAAAAAAAAAAA		AAAAAAAAAAAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.105E-03	0.0011
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.347E+00	0.9905
Pu-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	3.277E-03	0.0005
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.856E-02	0.0076
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.942E-03	0.0003
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
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	6.408E+00	1.0000
0*Sum of all water independent and dependent pathways.														

0*Sum of all water independent and dependent pathways.

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

As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Water Independent Pathways (Inhalation excludes radon)																			
0	Ground			Inhalation			Radon			Plant			Meat			Milk		Soil	
Radio-	AAAAA		AAAAA	AAAAA		AAAAA	AAAAA		AAAAA	AAAAA		AAAAA	AAAAA		AAAAA	AAAAA		AAAAA	
Nuclide	mrem/yr	fract.		mrem/yr	fract.		mrem/yr	fract.		mrem/yr	fract.		mrem/yr	fract.		mrem/yr	fract.		
AAAAAA	AAAAAA	AAAAAA		AAAAAA	AAAAAA		AAAAAA	AAAAAA		AAAAAA	AAAAAA		AAAAAA	AAAAAA		AAAAAA	AAAAAA		
Am-241	4.908E-04	0.0001		2.725E-03	0.0007		0.000E+00	0.0000		0.000E+00	0.0000		0.000E+00	0.0000		0.000E+00	0.0000		
Cs-137	3.697E+00	0.9867		2.469E-05	0.0000		0.000E+00	0.0000		0.000E+00	0.0000		0.000E+00	0.0000		0.000E+00	0.0000		
Pu-238	1.459E-06	0.0000		1.907E-03	0.0005		0.000E+00	0.0000		0.000E+00	0.0000		0.000E+00	0.0000		0.000E+00	0.0000		
Pu-239	3.762E-05	0.0000		3.299E-02	0.0088		0.000E+00	0.0000		0.000E+00	0.0000		0.000E+00	0.0000		0.000E+00	0.0000		
Sr-90	7.207E-04	0.0002		2.550E-05	0.0000		0.000E+00	0.0000		0.000E+00	0.0000		0.000E+00	0.0000		0.000E+00	0.0000		
ffffff	ffffff	fffff		ffffff	fffff		ffffff	fffff		ffffff	fffff		ffffff	fffff		ffffff	fffff		
Total	3.699E+00	0.9871		3.768E-02	0.0101		0.000E+00	0.0000		0.000E+00	0.0000		0.000E+00	0.0000		0.000E+00	0.0000		
0																			

0

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

		Water Dependent Pathways															
0		Water		Fish		Radon		Plant		Meat		Milk		All Pathways*			
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA		
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	
AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	
Pu-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	0.000E+00	0.0000	0.000E+00	0.0000	
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	
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	0.000E+00	0.0000	0.000E+00	0.0000	

0*Sum of all water independent and dependent pathways.

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

As mrem/yr and Fraction of Total Dose At t = 5.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

		Water Independent Pathways (Inhalation excludes radon)															
0		Ground		Inhalation		Radon		Plant		Meat		Milk		Soil			
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA		
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	
AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	
Am-241	3.078E-04	0.0001	1.428E-03	0.0007	0.000E+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-04	0.0002	
Cs-137	2.110E+00	0.9818	1.293E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.227E-04	0.0003	
Pu-238	1.233E-06	0.0000	1.350E-03	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.386E-04	0.0002	
Pu-239	3.534E-05	0.0000	2.734E-02	0.0127	0.000E+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-03	0.0032	
Sr-90	3.093E-04	0.0001	9.889E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.549E-05	0.0000	
ffffff	ffffff	fffff	ffffff	fffff	ffffff	fffff	ffffff	fffff	ffffff	fffff	ffffff	fffff	ffffff	fffff	ffffff	fffff	
Total	2.111E+00	0.9821	3.014E-02	0.0140	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.289E-03	0.0039	
0																	

0

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

As mrem/yr and Fraction of Total Dose At t = 5.000E+01 years

Water Dependent Pathways

		Water Dependent Pathways																	
0		Water		Fish		Radon		Plant		Meat		Milk		All Pathways*					
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA				
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.			
AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA			
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.096E-03	0.0010			
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.111E+00	0.9821			
Pu-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	0.000E+00	0.0000	1.690E-03	0.0008			
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.431E-02	0.0160			
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.547E-04	0.0002			
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii			
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	0.000E+00	0.0000	2.149E+00	1.0000			
0*Sum of all water independent and dependent pathways.																			

0*Sum of all water independent and dependent pathways.

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

As mrem/yr and Fraction of Total Dose At t = 7.500E+01 years

Water Independent Pathways (Inhalation excludes radon)

0	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
0	Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
	Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr
	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
	Am-241	1.698E-04	0.0002	5.999E-04	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.511E-04
	Cs-137	9.987E-01	0.9729	5.419E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.611E-04
	Pu-238	9.906E-07	0.0000	8.250E-04	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.070E-04
	Pu-239	3.166E-05	0.0000	2.034E-02	0.0198	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.159E-03
	Sr-90	1.030E-04	0.0001	2.849E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.023E-05
	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
	Total	9.990E-01	0.9731	2.178E-02	0.0212	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.788E-03

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

As mrem/yr and Fraction of Total Dose At t = 7.500E+01 years

Water Dependent Pathways

0	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
0	Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
	Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr
	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
	Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.208E-04
	Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.989E-01
	Pu-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	1.033E-03
	Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.553E-02
	Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.161E-04
	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
	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	1.027E+00

0*Sum of all water independent and dependent pathways.

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

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

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Am-241	8.971E-05	0.0002	2.235E-04	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.632E-05	0.0001
Cs-137	4.288E-01	0.9599	2.016E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.712E-05	0.0002
Pu-238	7.810E-07	0.0000	4.475E-04	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.123E-04	0.0003
Pu-239	2.644E-05	0.0001	1.343E-02	0.0301	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.407E-03	0.0076
Sr-90	3.132E-05	0.0001	7.285E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.614E-06	0.0000
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
Total	4.289E-01	0.9602	1.411E-02	0.0316	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.675E-03	0.0082

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

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.696E-04	0.0008
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.289E-01	0.9601
Pu-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	5.605E-04	0.0013
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.687E-02	0.0378
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.466E-05	0.0001
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
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	4.467E-01	1.0000

0*Sum of all water independent and dependent pathways.

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

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

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pu-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	0.000E+00	0.0000
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
iiiiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii
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	0.000E+00	0.0000

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

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

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pu-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	0.000E+00	0.0000
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
iiiiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii
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	0.000E+00	0.0000

0*Sum of all water independent and dependent pathways.

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

As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pu-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	0.000E+00	0.0000
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
iiiiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii
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	0.000E+00	0.0000

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

As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pu-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	0.000E+00	0.0000
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
iiiiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii
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	0.000E+00	0.0000

0*Sum of all water independent and dependent pathways.

Dose/Source Ratios Summed Over All Pathways												
Parent and Progeny Principal Radionuclide Contributions Indicated												
0 Parent	Product	Thread	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g)									
(i)	(j)	Fraction	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	5.000E+01	7.500E+01	1.000E+02	3.000E+02	1.000E+03
AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA
Am-241	Am-241	1.000E+00	1.323E-02	1.285E-02	1.212E-02	9.868E-03	5.419E-03	2.911E-03	1.279E-03	5.130E-04	0.000E+00	0.000E+00
Am-241	Np-237+D	1.000E+00	7.497E-09	2.217E-08	5.013E-08	1.345E-07	2.840E-07	3.406E-07	3.326E-07	2.689E-07	0.000E+00	0.000E+00
Am-241	U-233	1.000E+00	7.360E-16	5.074E-15	2.591E-14	2.045E-13	1.193E-12	2.218E-12	2.902E-12	2.705E-12	0.000E+00	0.000E+00
Am-241	Th-229+D	1.000E+00	5.229E-19	7.756E-18	8.824E-17	2.135E-15	3.988E-14	1.362E-13	3.072E-13	4.483E-13	0.000E+00	0.000E+00
Am-241	äDSR(j)		1.323E-02	1.285E-02	1.212E-02	9.868E-03	5.419E-03	2.911E-03	1.279E-03	5.133E-04	0.000E+00	0.000E+00
OCs-137+D	Cs-137+D	1.000E+00	9.085E-02	8.849E-02	8.395E-02	6.975E-02	4.064E-02	2.319E-02	1.098E-02	4.713E-03	0.000E+00	0.000E+00
OPu-238	Pu-238	1.840E-09	1.941E-11	1.913E-11	1.856E-11	1.670E-11	1.216E-11	8.611E-12	5.265E-12	2.857E-12	0.000E+00	0.000E+00
OPu-238	Pu-238	1.000E+00	1.055E-02	1.039E-02	1.009E-02	9.077E-03	6.611E-03	4.680E-03	2.861E-03	1.553E-03	0.000E+00	0.000E+00
Pu-238	U-234	1.000E+00	4.295E-09	1.271E-08	2.880E-08	7.760E-08	1.634E-07	1.906E-07	1.733E-07	1.246E-07	0.000E+00	0.000E+00
Pu-238	Th-230	1.000E+00	3.146E-14	2.179E-13	1.125E-12	9.219E-12	5.968E-11	1.223E-10	1.794E-10	1.858E-10	0.000E+00	0.000E+00
Pu-238	Ra-226+D	1.000E+00	1.298E-16	1.932E-15	2.213E-14	5.489E-13	1.096E-11	3.975E-11	9.598E-11	1.491E-10	0.000E+00	0.000E+00
Pu-238	Pb-210+D	1.000E+00	1.561E-20	4.763E-19	1.159E-17	7.973E-16	3.885E-14	1.969E-13	5.743E-13	9.526E-13	0.000E+00	0.000E+00
Pu-238	äDSR(j)		1.055E-02	1.039E-02	1.009E-02	9.077E-03	6.611E-03	4.680E-03	2.861E-03	1.553E-03	0.000E+00	0.000E+00
OPu-239	Pu-239	1.000E+00	1.162E-02	1.154E-02	1.138E-02	1.082E-02	9.220E-03	7.640E-03	5.687E-03	3.757E-03	0.000E+00	0.000E+00
Pu-239	U-235+D	1.000E+00	1.257E-11	3.748E-11	8.626E-11	2.464E-10	6.186E-10	8.727E-10	1.030E-09	9.901E-10	0.000E+00	0.000E+00
Pu-239	Pa-231	1.000E+00	1.387E-16	9.613E-16	4.963E-15	4.078E-14	2.660E-13	5.506E-13	8.215E-13	8.717E-13	0.000E+00	0.000E+00
Pu-239	Ac-227+D	1.000E+00	5.801E-18	8.531E-17	9.522E-16	2.153E-14	3.362E-13	9.777E-13	1.838E-12	2.264E-12	0.000E+00	0.000E+00
Pu-239	äDSR(j)		1.162E-02	1.154E-02	1.138E-02	1.082E-02	9.220E-03	7.640E-03	5.687E-03	3.757E-03	0.000E+00	0.000E+00
OSr-90+D	Sr-90+D	1.000E+00	8.128E-04	7.798E-04	7.177E-04	5.365E-04	2.314E-04	9.799E-05	3.207E-05	9.574E-06	0.000E+00	0.000E+00
íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí

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

0Nuclide	(i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	5.000E+01	7.500E+01	1.000E+02	3.000E+02	1.000E+03
AAAAAAAA	AAAAAAAA	AAAAAAAA	AAAAAAAA	AAAAAAAA	AAAAAAAA	AAAAAAAA	AAAAAAAA	AAAAAAAA	AAAAAAAA	AAAAAAAA	AAAAAAAA
Am-241	1.890E+03	1.945E+03	2.063E+03	2.533E+03	4.613E+03	8.587E+03	1.955E+04	4.870E+04	*3.431E+12	*3.431E+12	
Cs-137	2.752E+02	2.825E+02	2.978E+02	3.584E+02	6.151E+02	1.078E+03	2.277E+03	5.305E+03	*8.704E+13	*8.704E+13	
Pu-238	2.370E+03	2.405E+03	2.478E+03	2.754E+03	3.782E+03	5.342E+03	8.737E+03	1.610E+04	*1.712E+13	*1.712E+13	
Pu-239	2.152E+03	2.167E+03	2.197E+03	2.311E+03	2.711E+03	3.272E+03	4.396E+03	6.655E+03	*6.214E+10	*6.214E+10	
Sr-90	3.076E+04	3.206E+04	3.483E+04	4.660E+04	1.080E+05	2.551E+05	7.795E+05	2.611E+06	*1.365E+14	*1.365E+14	
íííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí

*At specific activity limit

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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
0Nuclide Initial      tmin      DSR(i,tmin) G(i,tmin) DSR(i,tmax) G(i,tmax)
(i)      (pCi/g)      (years)      (pCi/g)      (pCi/g)
AAAAAA  AAAAAA  AAAAAA  AAAAAA  AAAAAA  AAAAAA
Am-241  7.200E-01  0.000E+00  1.323E-02  1.890E+03  1.323E-02  1.890E+03
Cs-137  9.100E+01  0.000E+00  9.085E-02  2.752E+02  9.085E-02  2.752E+02
Pu-238  3.610E-01  0.000E+00  1.055E-02  2.370E+03  1.055E-02  2.370E+03
Pu-239  4.490E+00  0.000E+00  1.162E-02  2.152E+03  1.162E-02  2.152E+03
Sr-90   3.620E+00  0.000E+00  8.128E-04  3.076E+04  8.128E-04  3.076E+04
iiiiiii iiiiii  iiiiii  iiiiii  iiiiii  iiiiii  iiiiii

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Individual Nuclide Dose Summed Over All Pathways													
Parent Nuclide and Branch Fraction Indicated													
ONuclide	Parent	THF(i)	DOSE(j,t), mrem/yr										
(j)	(i)		t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	5.000E+01	7.500E+01	1.000E+02	3.000E+02	1.000E+03
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Am-241	Am-241	1.000E+00	9.526E-03	9.252E-03	8.727E-03	7.105E-03	3.902E-03	2.096E-03	9.205E-04	3.694E-04	0.000E+00	0.000E+00	0.000E+00
ONp-237	Am-241	1.000E+00	5.398E-09	1.596E-08	3.609E-08	9.682E-08	2.045E-07	2.452E-07	2.395E-07	1.936E-07	0.000E+00	0.000E+00	0.000E+00
OU-233	Am-241	1.000E+00	5.299E-16	3.653E-15	1.865E-14	1.472E-13	8.592E-13	1.597E-12	2.090E-12	1.948E-12	0.000E+00	0.000E+00	0.000E+00
0Th-229	Am-241	1.000E+00	3.765E-19	5.585E-18	6.353E-17	1.537E-15	2.871E-14	9.805E-14	2.212E-13	3.228E-13	0.000E+00	0.000E+00	0.000E+00
0Cs-137	Cs-137	1.000E+00	8.267E+00	8.053E+00	7.639E+00	6.347E+00	3.699E+00	2.111E+00	9.989E-01	4.289E-01	0.000E+00	0.000E+00	0.000E+00
0Pu-238	Pu-238	1.840E-09	7.007E-12	6.904E-12	6.702E-12	6.029E-12	4.391E-12	3.109E-12	1.901E-12	1.031E-12	0.000E+00	0.000E+00	0.000E+00
Pu-238	Pu-238	1.000E+00	3.808E-03	3.752E-03	3.642E-03	3.277E-03	2.386E-03	1.689E-03	1.033E-03	5.605E-04	0.000E+00	0.000E+00	0.000E+00
Pu-238	äDOSE(j)		3.808E-03	3.752E-03	3.642E-03	3.277E-03	2.386E-03	1.689E-03	1.033E-03	5.605E-04	0.000E+00	0.000E+00	0.000E+00
OU-234	Pu-238	1.000E+00	1.551E-09	4.590E-09	1.040E-08	2.801E-08	5.898E-08	6.881E-08	6.255E-08	4.497E-08	0.000E+00	0.000E+00	0.000E+00
0Th-230	Pu-238	1.000E+00	1.136E-14	7.867E-14	4.060E-13	3.328E-12	2.155E-11	4.415E-11	6.476E-11	6.706E-11	0.000E+00	0.000E+00	0.000E+00
ORa-226	Pu-238	1.000E+00	4.687E-17	6.975E-16	7.990E-15	1.981E-13	3.955E-12	1.435E-11	3.465E-11	5.384E-11	0.000E+00	0.000E+00	0.000E+00
0Pb-210	Pu-238	1.000E+00	5.634E-21	1.719E-19	4.183E-18	2.878E-16	1.402E-14	7.107E-14	2.073E-13	3.439E-13	0.000E+00	0.000E+00	0.000E+00
0Pu-239	Pu-239	1.000E+00	5.217E-02	5.181E-02	5.109E-02	4.856E-02	4.140E-02	3.431E-02	2.553E-02	1.687E-02	0.000E+00	0.000E+00	0.000E+00
OU-235	Pu-239	1.000E+00	5.644E-11	1.683E-10	3.873E-10	1.107E-09	2.777E-09	3.918E-09	4.623E-09	4.446E-09	0.000E+00	0.000E+00	0.000E+00
0Pa-231	Pu-239	1.000E+00	6.229E-16	4.316E-15	2.229E-14	1.831E-13	1.194E-12	2.472E-12	3.689E-12	3.914E-12	0.000E+00	0.000E+00	0.000E+00
0Ac-227	Pu-239	1.000E+00	2.605E-17	3.830E-16	4.275E-15	9.668E-14	1.510E-12	4.390E-12	8.254E-12	1.017E-11	0.000E+00	0.000E+00	0.000E+00
0Sr-90	Sr-90	1.000E+00	2.942E-03	2.823E-03	2.598E-03	1.942E-03	8.377E-04	3.547E-04	1.161E-04	3.466E-05	0.000E+00	0.000E+00	0.000E+00
iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii
THF(i) is the thread fraction of the parent nuclide.													

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

Individual Nuclide Soil Concentration													
Parent Nuclide and Branch Fraction Indicated				S(j,t), pCi/g									
ONuclide	Parent	THF(i)	t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	5.000E+01	7.500E+01	1.000E+02	3.000E+02	1.000E+03
(j)	(i)												
AAAAAAA	AAAAAAA	AAAAAAA		AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA
Am-241	Am-241	1.000E+00		7.200E-01	7.035E-01	6.717E-01	5.713E-01	3.597E-01	2.265E-01	1.270E-01	7.123E-02	6.973E-04	6.470E-11
ONp-237	Am-241	1.000E+00		0.000E+00	2.303E-07	6.742E-07	2.064E-06	4.905E-06	6.574E-06	7.663E-06	8.110E-06	6.544E-06	2.011E-06
OU-233	Am-241	1.000E+00		0.000E+00	5.043E-13	4.439E-12	4.565E-11	3.313E-10	7.475E-10	1.311E-09	1.835E-09	3.361E-09	1.259E-09
0Th-229	Am-241	1.000E+00		0.000E+00	1.592E-17	4.226E-16	1.477E-14	3.393E-13	1.345E-12	3.769E-12	7.481E-12	6.231E-11	2.031E-10
OCs-137	Cs-137	1.000E+00		9.100E+01	8.891E+01	8.488E+01	7.216E+01	4.537E+01	2.853E+01	1.597E+01	8.943E+00	8.638E-02	7.650E-09
OPu-238	Pu-238	1.840E-09		6.642E-10	6.589E-10	6.483E-10	6.125E-10	5.207E-10	4.426E-10	3.613E-10	2.950E-10	5.817E-11	1.982E-13
Pu-238	Pu-238	1.000E+00		3.610E-01	3.581E-01	3.523E-01	3.329E-01	2.830E-01	2.406E-01	1.964E-01	1.603E-01	3.162E-02	1.077E-04
Pu-238	äS(j):			3.610E-01	3.581E-01	3.523E-01	3.329E-01	2.830E-01	2.406E-01	1.964E-01	1.603E-01	3.162E-02	1.077E-04
OU-234	Pu-238	1.000E+00		0.000E+00	1.015E-06	2.994E-06	9.411E-06	2.387E-05	3.364E-05	4.091E-05	4.423E-05	2.480E-05	2.353E-07
0Th-230	Pu-238	1.000E+00		0.000E+00	4.581E-12	4.077E-11	4.356E-10	3.511E-09	8.747E-09	1.722E-08	2.685E-08	9.354E-08	1.291E-07
ORa-226	Pu-238	1.000E+00		0.000E+00	6.613E-16	1.765E-14	6.274E-13	1.508E-11	6.223E-11	1.821E-10	3.750E-10	3.493E-09	8.326E-09
OPb-210	Pu-238	1.000E+00		0.000E+00	5.109E-18	4.042E-16	4.601E-14	2.973E-12	1.846E-11	7.205E-11	1.775E-10	2.630E-09	7.283E-09
OPu-239	Pu-239	1.000E+00		4.490E+00	4.489E+00	4.487E+00	4.479E+00	4.457E+00	4.435E+00	4.408E+00	4.381E+00	4.170E+00	3.510E+00
OU-235	Pu-239	1.000E+00		0.000E+00	4.402E-09	1.309E-08	4.231E-08	1.164E-07	1.783E-07	2.414E-07	2.917E-07	4.490E-07	4.108E-07
OPa-231	Pu-239	1.000E+00		0.000E+00	4.651E-14	4.137E-13	4.413E-12	3.538E-11	8.768E-11	1.715E-10	2.657E-10	8.794E-10	1.028E-09
0Ac-227	Pu-239	1.000E+00		0.000E+00	4.877E-16	1.271E-14	4.175E-13	8.164E-12	2.813E-11	6.779E-11	1.182E-10	5.012E-10	6.162E-10
OSr-90	Sr-90	1.000E+00		3.620E+00	3.484E+00	3.228E+00	2.471E+00	1.151E+00	5.360E-01	2.063E-01	7.937E-02	3.816E-05	9.295E-17
iiiiiii	iiiiiii	iiiiiii		iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
THF(i) is the thread fraction of the parent nuclide.													
ORESCALC.EXE execution time = 1.41 seconds													

Exhibit 2

RESRAD Summary Report: CAU 383 CAS 12-25-02

Oil Spill: 20 Pages

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Dose Conversion Factor (and Related) Parameter Summary

File: FGR 13 MORBIDITY

Menu	Parameter	Current Value	Base Case*	Parameter Name
Dose conversion factors for inhalation, mrem/pCi:				
B-1	Ac-227+D	6.724E+00	6.700E+00	DCF2(1)
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2(2)
B-1	Pa-231	1.280E+00	1.280E+00	DCF2(3)
B-1	Pu-239	4.290E-01	4.290E-01	DCF2(4)
B-1	U-235+D	1.230E-01	1.230E-01	DCF2(5)
Dose conversion factors for ingestion, mrem/pCi:				
D-1	Ac-227+D	1.480E-02	1.410E-02	DCF3(1)
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3(2)
D-1	Pa-231	1.060E-02	1.060E-02	DCF3(3)
D-1	Pu-239	3.540E-03	3.540E-03	DCF3(4)
D-1	U-235+D	2.673E-04	2.660E-04	DCF3(5)
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	Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(2,1)
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(2,2)
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(2,3)
D-34	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(3,1)
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(3,2)
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(3,3)
D-34	Pu-239 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(4,1)
D-34	Pu-239 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(4,2)
D-34	Pu-239 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(4,3)
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(5,1)
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(5,2)
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(5,3)
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	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC(2,1)
D-5	Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(2,2)
D-5	Pa-231 , fish	1.000E+01	1.000E+01	BIOFAC(3,1)
D-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(3,2)
D-5	Pu-239 , fish	3.000E+01	3.000E+01	BIOFAC(4,1)
D-5	Pu-239 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(4,2)
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIOFAC(5,1)
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(5,2)

*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	Parameter Name
R011	Area of contaminated zone (m**2)	1.000E+02	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	1.500E-01	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	not used	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	5.000E+01	1.000E+02	---	T(6)
R011	Times for calculations (yr)	7.500E+01	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+02	1.000E+03	---	T(8)
R011	Times for calculations (yr)	3.000E+02	0.000E+00	---	T(9)
R011	Times for calculations (yr)	1.000E+03	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Cs-137	2.050E+01	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Pu-239	1.040E+00	0.000E+00	---	S1(4)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Pu-239	not used	0.000E+00	---	W1(4)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	3.400E+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)	3.260E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	0.000E+00	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
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

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD	Parameter Name

R015	Number of unsaturated zone strata	not used	1	---	NS
R015	Unsat. zone 1, thickness (m)	not used	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	not used	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	not used	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	not used	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	not used	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	not used	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	not used	1.000E+01	---	HCUZ(1)

R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	4.600E+03	4.600E+03	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	not used	4.600E+03	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	not used	4.600E+03	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.449E-05	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)

R016	Distribution coefficients for Pu-239				
R016	Contaminated zone (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCC(4)
R016	Unsaturated zone 1 (cm**3/g)	not used	2.000E+03	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	not used	2.000E+03	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.173E-04	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)

R016	Distribution coefficients for daughter Ac-227				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	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	2.153E-02	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)

R016	Distribution coefficients for daughter Pa-231				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.660E-03	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)

R016	Distribution coefficients for daughter U-235				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(5,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.660E-03	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)

R017	Inhalation rate (m**3/yr)	1.230E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	6.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	2.500E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	1.000E+00	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)	3.800E-02	2.500E-01	---	FOTD

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD	Parameter Name
Shape factor flag, external gamma					
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
Fractions of annular areas within AREA:					
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
Fruits, vegetables and grain consumption (kg/yr)					
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)
Soil ingestion rate (g/yr)					
R018	Soil ingestion rate (g/yr)	1.752E+02	3.650E+01	---	SOIL
Drinking water intake (L/yr)					
R018	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI
Contamination fraction of drinking water					
R018	Contamination fraction of drinking water	not used	1.000E+00	---	FDW
Contamination fraction of household water					
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
Contamination fraction of livestock water					
R018	Contamination fraction of livestock water	not used	1.000E+00	---	FLW
Contamination fraction of irrigation water					
R018	Contamination fraction of irrigation water	not used	1.000E+00	---	FIRW
Contamination fraction of aquatic food					
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
Contamination fraction of plant food					
R018	Contamination fraction of plant food	not used	-1	---	FPLANT
Contamination fraction of meat					
R018	Contamination fraction of meat	not used	-1	---	FMEAT
Contamination fraction of milk					
R018	Contamination fraction of milk	not used	-1	---	FMILK
Livestock fodder intake for meat (kg/day)					
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	---	LFI5
Livestock fodder intake for milk (kg/day)					
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
Livestock water intake for meat (L/day)					
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	---	LWI5
Livestock water intake for milk (L/day)					
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	---	LWI6
Livestock soil intake (kg/day)					
R019	Livestock soil intake (kg/day)	not used	5.000E-01	---	LSI

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

Uncontrolled When Printed

Site-Specific Parameter Summary (continued)

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

Summary of Pathway Selections

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

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
AAAAAAAAAAAAAAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAAAAAAAAAAAAAA	
Area:	100.00 square meters	Cs-137	2.050E+01
Thickness:	0.15 meters	Pu-239	1.040E+00
Cover Depth:	0.00 meters		

0

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)										
AAAAAAAAAAAAAAAAAAAAAAAAAAAA										
t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	5.000E+01	7.500E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	1.874E+00	1.826E+00	1.733E+00	1.441E+00	8.428E-01	4.834E-01	2.309E-01	1.005E-01	0.000E+00	0.000E+00
M(t):	7.498E-02	7.304E-02	6.931E-02	5.764E-02	3.371E-02	1.934E-02	9.238E-03	4.021E-03	0.000E+00	0.000E+00
0Maximum TDOSE(t):	1.874E+00 mrem/yr at t = 0.000E+00 years									

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

0	Water Independent Pathways (Inhalation excludes radon)													
0	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA
Cs-137	1.862E+00	0.9932	1.396E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.723E-04	0.0004
Pu-239	9.341E-06	0.0000	9.632E-03	0.0051	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.443E-03	0.0013
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
Total	1.862E+00	0.9932	9.646E-03	0.0051	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.115E-03	0.0017

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

0	Water Dependent Pathways													
0	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.862E+00	0.9936
Pu-239	0.000E+00	0.0000	0.000E+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-02	0.0064
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
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	1.874E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0	Water Independent Pathways (Inhalation excludes radon)													
0	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA
Cs-137	1.813E+00	0.9931	1.355E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.525E-04	0.0004
Pu-239	9.322E-06	0.0000	9.565E-03	0.0052	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.426E-03	0.0013
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
Total	1.813E+00	0.9931	9.579E-03	0.0052	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.078E-03	0.0017

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

0	Water Dependent Pathways													
0	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.814E+00	0.9934
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.200E-02	0.0066
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
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	1.826E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0	Water Independent Pathways (Inhalation excludes radon)													
0	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA
Cs-137	1.720E+00	0.9928	1.276E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.145E-04	0.0004
Pu-239	9.285E-06	0.0000	9.432E-03	0.0054	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.392E-03	0.0014
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
Total	1.720E+00	0.9928	9.444E-03	0.0055	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.006E-03	0.0017

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

0	Water Dependent Pathways													
0	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.721E+00	0.9932
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.183E-02	0.0068
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
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	1.733E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0	Water Independent Pathways (Inhalation excludes radon)													
0	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Cs-137	1.429E+00	0.9918	1.033E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.974E-04	0.0003
Pu-239	9.148E-06	0.0000	8.965E-03	0.0062	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.274E-03	0.0016
fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff
Total	1.429E+00	0.9918	8.976E-03	0.0062	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.771E-03	0.0019

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

0	Water Dependent Pathways													
0	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.430E+00	0.9922
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.125E-02	0.0078
fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff
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	1.441E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0	Water Independent Pathways (Inhalation excludes radon)													
0	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Cs-137	8.329E-01	0.9883	5.562E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.679E-04	0.0003
Pu-239	8.713E-06	0.0000	7.642E-03	0.0091	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.938E-03	0.0023
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
Total	8.329E-01	0.9883	7.648E-03	0.0091	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.206E-03	0.0026

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

0	Water Dependent Pathways													
0	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.332E-01	0.9886
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.589E-03	0.0114
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
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	8.428E-01	1.0000

0*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 5.000E+01 years

Water Independent Pathways (Inhalation excludes radon)														
	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA
Cs-137	4.753E-01	0.9833	2.912E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.403E-04	0.0003
Pu-239	8.186E-06	0.0000	6.332E-03	0.0131	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.606E-03	0.0033
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
Total	4.753E-01	0.9833	6.335E-03	0.0131	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.746E-03	0.0036

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 5.000E+01 years

Water Dependent Pathways														
	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.755E-01	0.9836
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.946E-03	0.0164
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
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	4.834E-01	1.0000

0*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 7.500E+01 years

0	Water Independent Pathways (Inhalation excludes radon)													
0	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA
Cs-137	2.250E-01	0.9741	1.221E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.881E-05	0.0003
Pu-239	7.333E-06	0.0000	4.712E-03	0.0204	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.195E-03	0.0052
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
Total	2.250E-01	0.9742	4.713E-03	0.0204	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.254E-03	0.0054

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 7.500E+01 years

0	Water Dependent Pathways													
0	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.250E-01	0.9744
Pu-239	0.000E+00	0.0000	0.000E+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-03	0.0256
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
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	2.309E-01	1.0000
0*Sum of all water independent and dependent pathways.														

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

Water Independent Pathways (Inhalation excludes radon)																												
0	Ground				Inhalation				Radon				Plant				Meat				Milk				Soil			
Radio-	mrem/yr		fract.		mrem/yr		fract.		mrem/yr		fract.		mrem/yr		fract.		mrem/yr		fract.		mrem/yr		fract.		mrem/yr		fract.	
Nuclide	mrem/yr		fract.		mrem/yr		fract.		mrem/yr		fract.		mrem/yr		fract.		mrem/yr		fract.		mrem/yr		fract.		mrem/yr		fract.	
Cs-137	9.659E-02	0.9609	4.542E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.188E-05	0.0002	7.891E-04	0.0079		
Pu-239	6.123E-06	0.0001	3.112E-03	0.0310	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.110E-04	0.0081				
Total	9.660E-02	0.9610	3.112E-03	0.0310	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.110E-04	0.0081				

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																												
0	Water				Fish				Radon				Plant				Meat				Milk				All Pathways*			
Radio-	mrem/yr fract.				mrem/yr fract.				mrem/yr fract.				mrem/yr fract.				mrem/yr fract.				mrem/yr fract.				mrem/yr fract.			
Nuclide	mrem/yr fract.				mrem/yr fract.				mrem/yr fract.				mrem/yr fract.				mrem/yr fract.				mrem/yr fract.				mrem/yr fract.			
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA			
Cs-137	0.000E+00	0.0000	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.661E-02	0.9611			
Pu-239	0.000E+00	0.0000	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.907E-03	0.0389			
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii			
Total	0.000E+00	0.0000	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.005E-01	1.0000			

0*Sum of all water independent and dependent pathways.

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

0	Water Independent Pathways (Inhalation excludes radon)															
0	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil			
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff
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	0.000E+00	0.0000	0.000E+00	0.0000

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

0	Water Dependent Pathways															
0	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*			
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff
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	0.000E+00	0.0000	0.000E+00	0.0000

0*Sum of all water independent and dependent pathways.

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

0	Water Independent Pathways (Inhalation excludes radon)															
0	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil			
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff
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	0.000E+00	0.0000	0.000E+00	0.0000

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

0	Water Dependent Pathways															
0	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*			
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff
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	0.000E+00	0.0000	0.000E+00	0.0000

0*Sum of all water independent and dependent pathways.

Dose/Source Ratios Summed Over All Pathways													
Parent and Progeny		Principal Radionuclide Contributions Indicated											
0	Parent	Product	Thread	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g)									
	(i)	(j)	Fraction	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	5.000E+01	7.500E+01	1.000E+02	3.000E+02	1.000E+03
	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA
	Cs-137+D	Cs-137+D	1.000E+00	9.085E-02	8.849E-02	8.395E-02	6.975E-02	4.064E-02	2.319E-02	1.098E-02	4.713E-03	0.000E+00	0.000E+00
0	Pu-239	Pu-239	1.000E+00	1.162E-02	1.154E-02	1.138E-02	1.082E-02	9.220E-03	7.640E-03	5.687E-03	3.757E-03	0.000E+00	0.000E+00
	Pu-239	U-235+D	1.000E+00	1.257E-11	3.748E-11	8.626E-11	2.464E-10	6.186E-10	8.727E-10	1.030E-09	9.901E-10	0.000E+00	0.000E+00
	Pu-239	Pa-231	1.000E+00	1.387E-16	9.613E-16	4.963E-15	4.078E-14	2.660E-13	5.506E-13	8.215E-13	8.717E-13	0.000E+00	0.000E+00
	Pu-239	Ac-227+D	1.000E+00	5.801E-18	8.531E-17	9.522E-16	2.153E-14	3.362E-13	9.777E-13	1.838E-12	2.264E-12	0.000E+00	0.000E+00
	Pu-239	äDSR(j)		1.162E-02	1.154E-02	1.138E-02	1.082E-02	9.220E-03	7.640E-03	5.687E-03	3.757E-03	0.000E+00	0.000E+00
	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí

The DSR includes contributions from associated (half-life 6 180 days) daughters.

0

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

Onuclide	(i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	5.000E+01	7.500E+01	1.000E+02	3.000E+02	1.000E+03
AAAAAAA		AAAAAAAAA	AAAAAAAAA	AAAAAAAAA	AAAAAAAAA	AAAAAAAAA	AAAAAAAAA	AAAAAAAAA	AAAAAAAAA	AAAAAAAAA	AAAAAAAAA
Cs-137		2.752E+02	2.825E+02	2.978E+02	3.584E+02	6.151E+02	1.078E+03	2.277E+03	5.305E+03	*8.704E+13	*8.704E+13
Pu-239		2.152E+03	2.167E+03	2.197E+03	2.311E+03	2.711E+03	3.272E+03	4.396E+03	6.655E+03	*6.214E+10	*6.214E+10
iiiiiii		iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii

*At specific activity limit

0

	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					
0Nuclide	Initial	tmin	DSR(i,tmin)	G(i,tmin)	DSR(i,tmax)	G(i,tmax)
(i)	(pCi/g)	(years)		(pCi/g)		(pCi/g)
AAAAAAAA	AAAAAAAAAA	AAAAAAAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA
Cs-137	2.050E+01	0.000E+00	9.085E-02	2.752E+02	9.085E-02	2.752E+02
Pu-239	1.040E+00	0.000E+00	1.162E-02	2.152E+03	1.162E-02	2.152E+03
ffffffif	fffffffiff	ffffffffffiffiffif	ffffffffff	ffffffffff	ffffffffff	ffffffffff

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

ONuclide	Parent	THF(i)	DOSE(j,t), mrem/yr										
(j)	(i)		t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	5.000E+01	7.500E+01	1.000E+02	3.000E+02	1.000E+03
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Cs-137	Cs-137	1.000E+00	1.862E+00	1.814E+00	1.721E+00	1.430E+00	8.332E-01	4.755E-01	2.250E-01	9.661E-02	0.000E+00	0.000E+00	0.000E+00
OPu-239	Pu-239	1.000E+00	1.208E-02	1.200E-02	1.183E-02	1.125E-02	9.589E-03	7.946E-03	5.914E-03	3.907E-03	0.000E+00	0.000E+00	0.000E+00
OU-235	Pu-239	1.000E+00	1.307E-11	3.898E-11	8.972E-11	2.563E-10	6.433E-10	9.076E-10	1.071E-09	1.030E-09	0.000E+00	0.000E+00	0.000E+00
OPa-231	Pu-239	1.000E+00	1.443E-16	9.997E-16	5.162E-15	4.241E-14	2.766E-13	5.726E-13	8.544E-13	9.065E-13	0.000E+00	0.000E+00	0.000E+00
OAc-227	Pu-239	1.000E+00	6.033E-18	8.872E-17	9.902E-16	2.239E-14	3.497E-13	1.017E-12	1.912E-12	2.355E-12	0.000E+00	0.000E+00	0.000E+00
iiiiii	iiiiii	iiiiii	iiiiii	iiiiii	iiiiii	iiiiii	iiiiii	iiiiii	iiiiii	iiiiii	iiiiii	iiiiii	iiiiii

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

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

ONuclide	Parent	THF(i)	S(j,t), pCi/g										
(j)	(i)		t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	5.000E+01	7.500E+01	1.000E+02	3.000E+02	1.000E+03
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Cs-137	Cs-137	1.000E+00	2.050E+01	2.003E+01	1.912E+01	1.626E+01	1.022E+01	6.427E+00	3.598E+00	2.015E+00	1.946E-02	1.723E-09	1.723E-09
OPu-239	Pu-239	1.000E+00	1.040E+00	1.040E+00	1.039E+00	1.037E+00	1.032E+00	1.027E+00	1.021E+00	1.015E+00	9.660E-01	8.131E-01	8.131E-01
OU-235	Pu-239	1.000E+00	0.000E+00	1.020E-09	3.032E-09	9.799E-09	2.696E-08	4.129E-08	5.592E-08	6.757E-08	1.040E-07	9.515E-08	9.515E-08
OPa-231	Pu-239	1.000E+00	0.000E+00	1.077E-14	9.582E-14	1.022E-12	8.194E-12	2.031E-11	3.972E-11	6.153E-11	2.037E-10	2.382E-10	2.382E-10
OAc-227	Pu-239	1.000E+00	0.000E+00	1.130E-16	2.945E-15	9.671E-14	1.891E-12	6.516E-12	1.570E-11	2.737E-11	1.161E-10	1.427E-10	1.427E-10
iiiiii	iiiiii	iiiiii	iiiiii	iiiiii	iiiiii	iiiiii	iiiiii	iiiiii	iiiiii	iiiiii	iiiiii	iiiiii	iiiiii

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

ORESCALC.EXE execution time = 1.05 seconds

Exhibit 3

RESRAD Summary Report: CAU 383 CAS 12-28-02

RMA: 23 Pages

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Time = 0.000E+00	11
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Dose Conversion Factor (and Related) Parameter Summary (continued)
File: FGR 13 MORBIDITY

0	3		3	Current	3	Base	3	Parameter
Menu	3	Parameter	3	Value	3	Case*	3	Name
AAAAA	3	AAAAA	3	AAAAA	3	AAAAA	3	AAAAA
D-34	3	Ra-226+D , plant/soil concentration ratio, dimensionless	3	4.000E-02	3	4.000E-02	3	RTF(8,1)
D-34	3	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3	1.000E-03	3	1.000E-03	3	RTF(8,2)
D-34	3	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3	1.000E-03	3	1.000E-03	3	RTF(8,3)
D-34	3		3		3		3	
D-34	3	Th-230 , plant/soil concentration ratio, dimensionless	3	1.000E-03	3	1.000E-03	3	RTF(9,1)
D-34	3	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3	1.000E-04	3	1.000E-04	3	RTF(9,2)
D-34	3	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3	5.000E-06	3	5.000E-06	3	RTF(9,3)
D-34	3		3		3		3	
D-34	3	U-234 , plant/soil concentration ratio, dimensionless	3	2.500E-03	3	2.500E-03	3	RTF(10,1)
D-34	3	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3	3.400E-04	3	3.400E-04	3	RTF(10,2)
D-34	3	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3	6.000E-04	3	6.000E-04	3	RTF(10,3)
D-34	3		3		3		3	
D-34	3	U-235+D , plant/soil concentration ratio, dimensionless	3	2.500E-03	3	2.500E-03	3	RTF(11,1)
D-34	3	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3	3.400E-04	3	3.400E-04	3	RTF(11,2)
D-34	3	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3	6.000E-04	3	6.000E-04	3	RTF(11,3)
D-5	3		3		3		3	
D-5	3	Bioaccumulation factors, fresh water, L/kg:	3		3		3	
D-5	3	Ac-227+D , fish	3	1.500E+01	3	1.500E+01	3	BIOFAC(1,1)
D-5	3	Ac-227+D , crustacea and mollusks	3	1.000E+03	3	1.000E+03	3	BIOFAC(1,2)
D-5	3		3		3		3	
D-5	3	Cs-137+D , fish	3	2.000E+03	3	2.000E+03	3	BIOFAC(2,1)
D-5	3	Cs-137+D , crustacea and mollusks	3	1.000E+02	3	1.000E+02	3	BIOFAC(2,2)
D-5	3		3		3		3	
D-5	3	Pa-231 , fish	3	1.000E+01	3	1.000E+01	3	BIOFAC(3,1)
D-5	3	Pa-231 , crustacea and mollusks	3	1.100E+02	3	1.100E+02	3	BIOFAC(3,2)
D-5	3		3		3		3	
D-5	3	Pb-210+D , fish	3	3.000E+02	3	3.000E+02	3	BIOFAC(4,1)
D-5	3	Pb-210+D , crustacea and mollusks	3	1.000E+02	3	1.000E+02	3	BIOFAC(4,2)
D-5	3		3		3		3	
D-5	3	Pu-238 , fish	3	3.000E+01	3	3.000E+01	3	BIOFAC(5,1)
D-5	3	Pu-238 , crustacea and mollusks	3	1.000E+02	3	1.000E+02	3	BIOFAC(5,2)
D-5	3		3		3		3	
D-5	3	Pu-239 , fish	3	3.000E+01	3	3.000E+01	3	BIOFAC(7,1)
D-5	3	Pu-239 , crustacea and mollusks	3	1.000E+02	3	1.000E+02	3	BIOFAC(7,2)
D-5	3		3		3		3	
D-5	3	Ra-226+D , fish	3	5.000E+01	3	5.000E+01	3	BIOFAC(8,1)
D-5	3	Ra-226+D , crustacea and mollusks	3	2.500E+02	3	2.500E+02	3	BIOFAC(8,2)
D-5	3		3		3		3	
D-5	3	Th-230 , fish	3	1.000E+02	3	1.000E+02	3	BIOFAC(9,1)
D-5	3	Th-230 , crustacea and mollusks	3	5.000E+02	3	5.000E+02	3	BIOFAC(9,2)
D-5	3		3		3		3	
D-5	3	U-234 , fish	3	1.000E+01	3	1.000E+01	3	BIOFAC(10,1)
D-5	3	U-234 , crustacea and mollusks	3	6.000E+01	3	6.000E+01	3	BIOFAC(10,2)
D-5	3		3		3		3	
D-5	3	U-235+D , fish	3	1.000E+01	3	1.000E+01	3	BIOFAC(11,1)
D-5	3	U-235+D , crustacea and mollusks	3	6.000E+01	3	6.000E+01	3	BIOFAC(11,2)
iiiiii	3	iiiiii	3	iiiiii	3	iiiiii	3	iiiiii

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

Menu	Parameter	User Input	Default	Used by RESRAD	Parameter Name

R011	Area of contaminated zone (m**2)	1.000E+02	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	1.500E-01	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	not used	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	5.000E+01	1.000E+02	---	T(6)
R011	Times for calculations (yr)	7.500E+01	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+02	1.000E+03	---	T(8)
R011	Times for calculations (yr)	3.000E+02	0.000E+00	---	T(9)
R011	Times for calculations (yr)	1.000E+03	0.000E+00	---	T(10)

R012	Initial principal radionuclide (pCi/g): Cs-137	1.140E+02	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Pu-238	2.320E-01	0.000E+00	---	S1(5)
R012	Initial principal radionuclide (pCi/g): Pu-239	2.090E+00	0.000E+00	---	S1(7)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Pu-238	not used	0.000E+00	---	W1(5)
R012	Concentration in groundwater (pCi/L): Pu-239	not used	0.000E+00	---	W1(7)

R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	3.400E+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)	3.260E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	0.000E+00	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
R013	Accuracy for water/soil computations	not used	1.000E-03	---	EPS

R014	Density of saturated zone (g/cm**3)	not used	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	not used	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	not used	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	not used	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	not used	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	not used	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	not used	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	not used	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	not used	ND	---	MODEL

Site-Specific Parameter Summary (continued)					
Menu	Parameter	User Input	Default	Used by RESRAD	Parameter Name
AA					

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Menu		Parameter	User Input	Default	(If different from user input)	Parameter Name
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)	
Fruits, vegetables and grain consumption (kg/yr)						
R018	Leafy vegetable consumption (kg/yr)	not used	1.600E+02	---	DIET(1)	
R018	Milk consumption (L/yr)	not used	1.400E+01	---	DIET(2)	
R018	Meat and poultry consumption (kg/yr)	not used	9.200E+01	---	DIET(3)	
R018	Fish consumption (kg/yr)	not used	6.300E+01	---	DIET(4)	
R018	Other seafood consumption (kg/yr)	not used	5.400E+00	---	DIET(5)	
R018	Soil ingestion rate (g/yr)	not used	9.000E-01	---	DIET(6)	
R018	Drinking water intake (L/yr)	1.752E+02	3.650E+01	---	SOIL	
R018	Contamination fraction of drinking water	not used	5.100E+02	---	DWI	
R018	Contamination fraction of household water	not used	1.000E+00	---	FDW	
R018	Contamination fraction of livestock water	not used	1.000E+00	---	FHHW	
R018	Contamination fraction of irrigation water	not used	1.000E+00	---	FLW	
R018	Contamination fraction of aquatic food	not used	1.000E+00	---	FIRW	
R018	Contamination fraction of plant food	not used	5.000E-01	---	FR9	
R018	Contamination fraction of meat	not used	-1	---	FPLANT	
R018	Contamination fraction of milk	not used	-1	---	FMEAT	
R018	Contamination fraction of milk	not used	-1	---	FMILK	
Livestock fodder intake for meat (kg/day)						
R019	Livestock fodder intake for milk (kg/day)	not used	6.800E+01	---	LFI5	
R019	Livestock water intake for meat (L/day)	not used	5.500E+01	---	LFI6	
R019	Livestock water intake for milk (L/day)	not used	5.000E+01	---	LWI5	
R019	Livestock soil intake (kg/day)	not used	1.600E+02	---	LWI6	
R019	Mass loading for foliar deposition (g/m**3)	not used	5.000E-01	---	LSI	
R019	Depth of soil mixing layer (m)	not used	1.000E-04	---	MLFD	
R019	Depth of roots (m)	1.500E-01	1.500E-01	---	DM	
R019	Drinking water fraction from ground water	not used	9.000E-01	---	DROOT	
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWDW	
R019	Livestock water fraction from ground water	not used	1.000E+00	---	FGWHH	
R019	Irrigation fraction from ground water	not used	1.000E+00	---	FGWLW	
R019	Irrigation fraction from ground water	not used	1.000E+00	---	FGWIR	
Wet weight crop yield for Non-Leafy (kg/m**2)						
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	7.000E-01	---	YV(1)	
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.500E+00	---	YV(2)	
R19B	Growing Season for Non-Leafy (years)	not used	1.100E+00	---	YV(3)	
R19B	Growing Season for Leafy (years)	not used	1.700E-01	---	TE(1)	
R19B	Growing Season for Fodder (years)	not used	2.500E-01	---	TE(2)	
R19B	Translocation Factor for Non-Leafy	not used	8.000E-02	---	TE(3)	
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	---	TIV(1)	

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Site-Specific Parameter Summary (continued)					
0	3	3	3	3	3
Menu	Parameter	User	Default	Used by RESRAD	Parameter Name
AAAAAA					
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	---	EVSIN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSIN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
C14	DCF correction factor for gaseous forms of C14	not used	0.000E+00	---	CO2F
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
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	---	HMX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX

Site-Specific Parameter Summary (continued)				
0	3	3	3	3
Menu	Parameter	User Input	Used by RESRAD	Parameter Name
AAAA	AAAA	AAAA	AAAA	AAAA
TITL	Maximum number of integration points for risk	257	---	KYMAX
ffff	ffff	ffff	ffff	ffff

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
ffff	ffff

Contaminated Zone Dimensions				Initial Soil Concentrations, pCi/g						
AAAAAAAAAAAAAAAAAAAAAAAAAAAA				AAAAAAAAAAAAAAAAAAAAAAAAAAAA						
Area:	100.00	square meters		Cs-137	1.140E+02					
Thickness:	0.15	meters		Pu-238	2.320E-01					
Cover Depth:	0.00	meters		Pu-239	2.090E+00					
0										
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)										
AAAAAAAAAAAAAAAAAAAAAAAAAAAA										
t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	5.000E+01	7.500E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	1.038E+01	1.011E+01	9.596E+00	7.976E+00	4.654E+00	2.661E+00	1.264E+00	5.455E-01	0.000E+00	0.000E+00
M(t):	4.153E-01	4.046E-01	3.839E-01	3.190E-01	1.862E-01	1.064E-01	5.056E-02	2.182E-02	0.000E+00	0.000E+00
0Maximum TDOSE(t): 1.038E+01 mrem/yr at t = 0.000E+00 years										

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

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

Water Independent Pathways (Inhalation excludes radon)

0

0	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAAA	AAAAAAA	AAAAA	AAAAAAA	AAAAA	AAAAAAA	AAAAA	AAAAAAA	AAAAA	AAAAAAA	AAAAA	AAAAAAA	AAAAA	AAAAAAA	AAAAA
Cs-137	1.035E+01	0.9971	7.761E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.739E-03	0.0004
Pu-238	1.202E-06	0.0000	1.956E-03	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.906E-04	0.0000
Pu-239	1.877E-05	0.0000	1.936E-02	0.0019	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.909E-03	0.0005
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
Total	1.035E+01	0.9971	2.139E-02	0.0021	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.138E-03	0.0009

0

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

0

0	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.036E+01	0.9974
Pu-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	2.447E-03	0.0002
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.428E-02	0.0023
iiiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii
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+01	1.0000

0*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)													
0	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil
0	Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
	Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
	Cs-137	1.008E+01	0.9970	7.533E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	Pu-238	1.192E-06	0.0000	1.927E-03	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	Pu-239	1.873E-05	0.0000	1.922E-02	0.0019	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
	Total	1.008E+01	0.9970	2.122E-02	0.0021	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
0													

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													
0	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*
0	Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
	Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
	Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.9974
	Pu-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	0.0002
	Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0024
	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
	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	1.0000
0													

0*Sum of all water independent and dependent pathways.

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

		Water Independent Pathways (Inhalation excludes radon)														
		Ground		Inhalation		Radon		Plant		Meat		Milk		Soil		
Radio-	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Cs-137	9.567E+00	0.9969	7.094E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.417E-03	0.0004
Pu-238	1.172E-06	0.0000	1.870E-03	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.692E-04	0.0000
Pu-239	1.866E-05	0.0000	1.895E-02	0.0020	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.807E-03	0.0005
iiiiiiii	iiiiiiiiii	iiiiiiii	iiiiiiiiii	iiiiiiii	iiiiiiiiii	iiiiiiii	iiiiiiiiii	iiiiiiii	iiiiiiiiii	iiiiiiii	iiiiiiiiii	iiiiiiii	iiiiiiiiii	iiiiiiii	iiiiiiiiii	iiiiiiii
Total	9.567E+00	0.9969	2.090E-02	0.0022	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.693E-03	0.0009
0																

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																
0	Water				Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAAAAAAAAAAAAA				AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.570E+00	0.9973
Pu-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	0.000E+00	0.0000	2.341E-03	0.0002
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+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-02	0.0025
iiiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii
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	0.000E+00	0.0000	9.596E+00	1.0000
0*Sum of all water independent and dependent pathways.																

0*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)															
	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil		
Radio-	AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	
AAAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	
Cs-137	7.948E+00	0.9965	5.743E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.766E-03	0.0003	
Pu-238	1.107E-06	0.0000	1.683E-03	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.221E-04	0.0001	
Pu-239	1.838E-05	0.0000	1.802E-02	0.0023	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.569E-03	0.0006	
iiiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	
Total	7.948E+00	0.9966	1.976E-02	0.0025	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.757E-03	0.0010	

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

Water Dependent Pathways															
	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*		
Radio-	AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	
AAAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.951E+00	0.9969	
Pu-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	2.106E-03	0.0003	
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.260E-02	0.0028	
iiiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	
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	7.976E+00	1.0000	

0*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)													
	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil
Radio-	AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr
AAAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAA
Cs-137	4.632E+00	0.9952	3.093E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.490E-03
Pu-238	9.379E-07	0.0000	1.225E-03	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.074E-04
Pu-239	1.751E-05	0.0000	1.536E-02	0.0033	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.895E-03
iiiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii
Total	4.632E+00	0.9952	1.661E-02	0.0036	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.692E-03

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													
	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*
Radio-	AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr
AAAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAA
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.633E+00
Pu-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	1.534E-03
Pu-239	0.000E+00	0.0000	0.000E+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
iiiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii
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	4.654E+00

0*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 5.000E+01 years

Water Independent Pathways (Inhalation excludes radon)													
	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil
Radio-	AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr
AAAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAA
Cs-137	2.643E+00	0.9933	1.619E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.801E-04
Pu-238	7.923E-07	0.0000	8.674E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.176E-04
Pu-239	1.645E-05	0.0000	1.273E-02	0.0048	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.227E-03
iiiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii
Total	2.643E+00	0.9933	1.361E-02	0.0051	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.225E-03

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 5.000E+01 years

Water Dependent Pathways													
	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*
Radio-	AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr
AAAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAA
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.644E+00
Pu-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	1.086E-03
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.597E-02
iiiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii
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	2.661E+00

0*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 7.500E+01 years

Water Independent Pathways (Inhalation excludes radon)														
0	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Cs-137	1.251E+00	0.9898	6.789E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.270E-04	0.0003
Pu-238	6.366E-07	0.0000	5.302E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.330E-04	0.0001
Pu-239	1.474E-05	0.0000	9.469E-03	0.0075	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.401E-03	0.0019
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
Total	1.251E+00	0.9898	1.001E-02	0.0079	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.861E-03	0.0023
0														

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 7.500E+01 years

Water Dependent Pathways														
0	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.251E+00	0.9901
Pu-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	6.638E-04	0.0005
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.189E-02	0.0094
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
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	1.264E+00	1.0000
0*Sum of all water independent and dependent pathways.														

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

Water Independent Pathways (Inhalation excludes radon)																					
0	Ground			Inhalation			Radon			Plant			Meat			Milk			Soil		
Radio-	AAAAAAAAAAAA			AAAAAAAAAAAA			AAAAAAAAAAAA			AAAAAAAAAAAA			AAAAAAAAAAAA			AAAAAAAAAAAA			AAAAAAAAAAAA		
Nuclide	mrem/yr	fract.		mrem/yr	fract.		mrem/yr	fract.		mrem/yr	fract.		mrem/yr	fract.		mrem/yr	fract.		mrem/yr	fract.	
AAAAAA	AAAAAAAAAA	AAAAAA		AAAAAAAAAA	AAAAAA		AAAAAAAAAA	AAAAAA		AAAAAAAAAA	AAAAAA		AAAAAAAAAA	AAAAAA		AAAAAAAAAA	AAAAAA		AAAAAAAAAA	AAAAAA	
Cs-137	5.371E-01	0.9847		2.526E-06	0.0000		0.000E+00	0.0000		0.000E+00	0.0000		0.000E+00	0.0000		0.000E+00	0.0000		0.000E+00	0.0000	
Pu-238	5.019E-07	0.0000		2.876E-04	0.0005		0.000E+00	0.0000		0.000E+00	0.0000		0.000E+00	0.0000		0.000E+00	0.0000		0.000E+00	0.0000	
Pu-239	1.230E-05	0.0000		6.253E-03	0.0115		0.000E+00	0.0000		0.000E+00	0.0000		0.000E+00	0.0000		0.000E+00	0.0000		0.000E+00	0.0000	
iiiiiii	iiiiiii	iiiiii		iiiiiii	iiiiii		iiiiiii	iiiiii		iiiiiii	iiiiii		iiiiiii	iiiiii		iiiiiii	iiiiii		iiiiiii	iiiiii	
Total	5.371E-01	0.9847		6.543E-03	0.0120		0.000E+00	0.0000		0.000E+00	0.0000		0.000E+00	0.0000		0.000E+00	0.0000		0.000E+00	0.0000	
0																					

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														
0	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA	AAAAAA	AAAAA
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.373E-01	0.9849
Pu-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	3.602E-04	0.0007
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.851E-03	0.0144
iiiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii
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	5.455E-01	1.0000
0*Sum of all water independent and dependent pathways.														

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

Water Independent Pathways (Inhalation excludes radon)																												
0	Ground				Inhalation				Radon				Plant				Meat				Milk				Soil			
Radio-	AAAAA				AAAAA				AAAAA				AAAAA				AAAAA				AAAAA				AAAAA			
Nuclide	mrem/yr		fract.		mrem/yr		fract.		mrem/yr		fract.		mrem/yr		fract.		mrem/yr		fract.		mrem/yr		fract.		mrem/yr		fract.	
AAAAAA	AAAAAA		AAAAAA		AAAAAA		AAAAAA		AAAAAA		AAAAAA		AAAAAA		AAAAAA		AAAAAA		AAAAAA		AAAAAA		AAAAAA		AAAAAA		AAAAAA	
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pu-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	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff	fffff
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	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
0																												

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)															
		Ground		Inhalation		Radon		Plant		Meat		Milk		Soil			
Radio-	Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Cs-137		0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pu-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	0.000E+00	0.0000	0.000E+00	0.0000
Pu-239		0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii
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	0.000E+00	0.0000	0.000E+00	0.0000

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

		Water Dependent Pathways															
		Water		Fish		Radon		Plant		Meat		Milk		All Pathways*			
Radio-	Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Cs-137		0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pu-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	0.000E+00	0.0000	0.000E+00	0.0000
Pu-239		0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii
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	0.000E+00	0.0000	0.000E+00	0.0000

0*Sum of all water independent and dependent pathways.

Uncontrolled When Printed

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

0Nuclide	Parent	THF(i)	DOSE(j,t), mrem/yr										
(j)	(i)		t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	5.000E+01	7.500E+01	1.000E+02	3.000E+02	1.000E+03
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Cs-137	Cs-137	1.000E+00	1.036E+01	1.009E+01	9.570E+00	7.951E+00	4.633E+00	2.644E+00	1.251E+00	5.373E-01	0.000E+00	0.000E+00	0.000E+00
0Pu-238	Pu-238	1.840E-09	4.503E-12	4.437E-12	4.307E-12	3.875E-12	2.822E-12	1.998E-12	1.221E-12	6.628E-13	0.000E+00	0.000E+00	0.000E+00
Pu-238	Pu-238	1.000E+00	2.447E-03	2.411E-03	2.341E-03	2.106E-03	1.534E-03	1.086E-03	6.638E-04	3.602E-04	0.000E+00	0.000E+00	0.000E+00
Pu-238	äDOSE(j)		2.447E-03	2.411E-03	2.341E-03	2.106E-03	1.534E-03	1.086E-03	6.638E-04	3.602E-04	0.000E+00	0.000E+00	0.000E+00
0U-234	Pu-238	1.000E+00	9.965E-10	2.950E-09	6.680E-09	1.800E-08	3.790E-08	4.422E-08	4.020E-08	2.890E-08	0.000E+00	0.000E+00	0.000E+00
0Th-230	Pu-238	1.000E+00	7.299E-15	5.056E-14	2.609E-13	2.139E-12	1.385E-11	2.838E-11	4.162E-11	4.310E-11	0.000E+00	0.000E+00	0.000E+00
0Ra-226	Pu-238	1.000E+00	3.012E-17	4.482E-16	5.135E-15	1.273E-13	2.542E-12	9.223E-12	2.227E-11	3.460E-11	0.000E+00	0.000E+00	0.000E+00
0Pb-210	Pu-238	1.000E+00	3.621E-21	1.105E-19	2.688E-18	1.850E-16	9.012E-15	4.567E-14	1.332E-13	2.210E-13	0.000E+00	0.000E+00	0.000E+00
0Pu-239	Pu-239	1.000E+00	2.428E-02	2.412E-02	2.378E-02	2.260E-02	1.927E-02	1.597E-02	1.189E-02	7.851E-03	0.000E+00	0.000E+00	0.000E+00
0U-235	Pu-239	1.000E+00	2.627E-11	7.833E-11	1.803E-10	5.151E-10	1.293E-09	1.824E-09	2.152E-09	2.069E-09	0.000E+00	0.000E+00	0.000E+00
0Pa-231	Pu-239	1.000E+00	2.900E-16	2.009E-15	1.037E-14	8.522E-14	5.559E-13	1.151E-12	1.717E-12	1.822E-12	0.000E+00	0.000E+00	0.000E+00
0Ac-227	Pu-239	1.000E+00	1.212E-17	1.783E-16	1.990E-15	4.500E-14	7.027E-13	2.043E-12	3.842E-12	4.733E-12	0.000E+00	0.000E+00	0.000E+00
íííííííí	íííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí

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

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

0Nuclide	Parent	THF(i)	S(j,t), pCi/g										
(j)	(i)		t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	5.000E+01	7.500E+01	1.000E+02	3.000E+02	1.000E+03
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Cs-137	Cs-137	1.000E+00	1.140E+02	1.114E+02	1.063E+02	9.040E+01	5.684E+01	3.574E+01	2.001E+01	1.120E+01	1.082E-01	9.584E-09	
0Pu-238	Pu-238	1.840E-09	4.269E-10	4.234E-10	4.166E-10	3.936E-10	3.346E-10	2.845E-10	2.322E-10	1.896E-10	3.739E-11	1.273E-13	
Pu-238	Pu-238	1.000E+00	2.320E-01	2.301E-01	2.264E-01	2.139E-01	1.819E-01	1.546E-01	1.262E-01	1.030E-01	2.032E-02	6.921E-05	
Pu-238	äS(j):		2.320E-01	2.301E-01	2.264E-01	2.139E-01	1.819E-01	1.546E-01	1.262E-01	1.030E-01	2.032E-02	6.921E-05	
0U-234	Pu-238	1.000E+00	0.000E+00	6.522E-07	1.924E-06	6.048E-06	1.534E-05	2.162E-05	2.629E-05	2.843E-05	1.594E-05	1.512E-07	
0Th-230	Pu-238	1.000E+00	0.000E+00	2.944E-12	2.620E-11	2.800E-10	2.256E-09	5.622E-09	1.107E-08	1.726E-08	6.011E-08	8.298E-08	
0Ra-226	Pu-238	1.000E+00	0.000E+00	4.250E-16	1.134E-14	4.032E-13	9.693E-12	3.999E-11	1.170E-10	2.410E-10	2.245E-09	5.351E-09	
0Pb-210	Pu-238	1.000E+00	0.000E+00	3.283E-18	2.598E-16	2.957E-14	1.911E-12	1.187E-11	4.630E-11	1.141E-10	1.690E-09	4.681E-09	
0Pu-239	Pu-239	1.000E+00	2.090E+00	2.089E+00	2.088E+00	2.085E+00	2.075E+00	2.064E+00	2.052E+00	2.039E+00	1.941E+00	1.634E+00	
0U-235	Pu-239	1.000E+00	0.000E+00	2.049E-09	6.093E-09	1.969E-08	5.417E-08	8.298E-08	1.124E-07	1.358E-07	2.090E-07	1.912E-07	
0Pa-231	Pu-239	1.000E+00	0.000E+00	2.165E-14	1.926E-13	2.054E-12	1.647E-11	4.081E-11	7.981E-11	1.237E-10	4.094E-10	4.787E-10	
0Ac-227	Pu-239	1.000E+00	0.000E+00	2.270E-16	5.918E-15	1.943E-13	3.800E-12	1.310E-11	3.156E-11	5.500E-11	2.333E-10	2.868E-10	
íííííííí	íííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí

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

0RESALC.EXE execution time = 1.47 seconds

Appendix E

Closure Summary

E.1.0 Closure Summary

A land-use restriction will be applied as part of the closure in place alternative for CAU 383. These restrictions will be applied to control use and limit access to the site to prevent inadvertent exposure to the radionuclide contaminated soil identified in the muckpile (CAS 12-06-06) and the benzo(a)pyrene identified in the oil spill (CAS 12-25-02). The radionuclide contamination was identified at various depths in the muckpile at levels which exceeded the FALs. The benzo(a)pyrene was only found in one sample at the surface in the oil spill CAS at a level which exceeded the FAL. The completed land-use restriction form and associated documentation are included.

The following warning appears on the signs posted around CAU 383.

WARNING

Radiologically Contaminated Areas

FFACO Sites CAU 383, Area 12 E-Tunnel Sites

CAS 12-28-02, Radioactive Material Area

CAS 12-06-06, E-Tunnel Muckpile

CAS 12-25-02, Oil Spill

Access to this area is not permitted without U.S. Government permission.

Before working in this area,

Contact Real Estate Services at 295-2528

This site can be closed without further corrective action.

CAU Use Restriction Information

CAU Number/Description: 383/Area 12 E-Tunnel Sites

Applicable CAS Numbers/Descriptions: 12-06-06/Muckpile, 12-25-02/Oil Spill, 12-28-02/Radioactive Material

Contact (organization/project): DTRA Environmental Program Manager

Surveyed Area (UTM, Zone 11, NAD 27, meters): See Attached Figure

NW Corner 4,115,986.2 N 571,510.5 E

W Center 4,115,938.0 N 571,475.6 E

SW Corner 4,115,685.5 N 571,517.4 E

SE Corner 4,115,656.1 N 572,005.6 E

NE Corner 4,115,814.5 N 572,067.8 E

Survey Date: 6/23/2004 **Survey Method (GPS, etc):** GPS

Site Monitoring Requirements: Certify that markers and postings are in place, intact, and readable.

Required Frequency (quarterly, annually?): Annually

If Monitoring Has Started, Indicate last Completion Date: _____

Use Restrictions

The future use of any land related to this Corrective Action Unit (CAU), as described by the above surveyed location, is restricted from any DOE or Air Force activity that may alter or modify the containment control as approved by the state and identified in the CAU Closure Report or other CAU documentation unless appropriate concurrence is obtained in advance.

Comments: See the Closure Report for additional information on the condition of the site(s). Results of the annual inspection will be provided in the annual Post Closure Inspection Monitoring Report.

Submitted By: **Date:** 2/21/07

Submitted By: **Date:** 2/21/07

**cc with copy of survey map (paper and digital (.dgn) formats):
CAU Files (2 copies)**

Figure E.1-1
CAU 383 Area 12 E-Tunnel Sites

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