Attachment K

Final Status Survey Report #11 Documentation

(UNDER SEPARATE COVER)

FINAL

COLUMBUS CLOSURE PROJECT CHARACTERIZATION AND FINAL STATUS SURVEY REPORT FOR MANHOLE 7 TO MANHOLE A SEWER LINE

Revision 2
June 16, 2006

Prepared by

ECC & E2 Closure Services
1425 State Route 142 East
West Jefferson, OH 43162

Contract Number: DE-AC24-04OH20171

Final Characterization and Final Status Report for ANFB MH-7 to MH-A Sewer Line

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1.0 Introduction

This report contains the final status surveys (FSS) of the manhole (MH)-7 to MH-A sanitary sewer line located at the Columbus Closure Project (CCP). 1425 State Route 142 East, West Jefferson, OH 43162. Final status surveys were conducted according to the guidance presented in the *Manual for Conducting Surveys in Support of License Termination*, NUREG/CR-5849 (NUREG/CR-5849) (ORAU, 1992) and the *Radiological Characterization and Final Status Plan for Battelle Columbus Laboratories Decommissioning Project, West Jefferson Site*, DD-97-02 (Final Status Plan) (Battelle, 2000). The final status surveys were conducted in October of 2004 and performed under Work Instruction 2806 (Closure Services, 2004).

The intent of this final status survey report is to provide a complete and unambiguous record of the radiological status of the MH-7 to MH-A sanitary sewer line excavation. Sufficient information and data is provided to enable an independent re-creation and evaluation at some future date of both the survey activities and the reported results for the excavation. Information in this report is also available in referenced technical basis documents, final status survey plans and procedures, and the *Battelle Memorial Institute Columbus Operations, Decommissioning Plan*, DD-93-19 (BMI Decommissioning Plan), and reporting and quality assurance procedures.

To the extent practicable, this final status survey report is presented with minimal information incorporated by reference. This final status survey report has been generated following the comprehensive, annotated outline presented in Chapter 9 of NUREG-5849 (ORAU, 1992).

1.1 Background

On April 16, 1943, BMI, acting through what is now its Battelle Columbus Operations (BCO), entered into Contract No. W-7405-ENG-92 with the Manhattan Engineering District to perform atomic energy research and development (R&D) activities. BCO performed nuclear materials research and development at privately-owned facilities for the Manhattan Engineering District and its successor agencies – the Atomic Energy Commission (AEC), the Energy Research and Development Agency (ERDA), and the Department of Energy (DOE). Research and development continued until 1988 (Battelle, 2003a).

The BCO facilities at the King Avenue Site, Columbus, Ohio, and the West Jefferson North (WJN) and South (WJS) Sites, West Jefferson, Ohio, became partially radiologically contaminated as a result of the R&D activities. Decontamination of the King Avenue Sites has been completed and activities continue at the WJN site. The DOE, as the successor to the AEC and the Government's earlier work, is the agreed party with predominant liability and responsibility for decontamination and decommissioning (D&D) of the BCO facilities (Battelle, 2003a). The Assistant Secretary for Nuclear

Energy of the DOE accepted the decontamination and decommissioning (D&D) of the WJN into the DOE's Surplus Facilities Management Program as a major project (DOE. 1986). The DOE is the agency funding and managing the cleanup of the WJN (Battelle. 2003a). However, the site is not a DOE-owned facility.

BMI holds U.S. Nuclear Regulatory Commission (NRC) license number SNM-7. BMI has continually operated and conducted D&D activities in full compliance with this NRC license. The BMI Decommissioning Plan for the WJN site does not serve as a declaration to terminate SNM-7, but establish the criteria for performing D&D activities. The end goal of the BMI Decommissioning Plan is to reach unrestricted use conditions for the site (Battelle. 2003a).

The DOE has contracted ECC&E2 Closure Services. LLC (Closure Services) to safely remove DOE radioactive materials and contamination from WJN site. Removal of radioactive material will be to levels allowing future use of the site without radiological restrictions as described in the BMI Decommissioning Plan. Closure Services has conducted characterization and final status surveys of the MH-7 to MH-A sanitary sewer line excavation to demonstrate that the area is available for unrestricted release.

2.0 Site Description

Created in 1984, the Battelle Columbus Decommissioning Project (BCLDP) is a remediation project that includes nine buildings at the King Avenue site and five at the WJN site. The CCP is the successor of the BCLDP. The WJN site has one remaining permanent structure (Well House). Three former research facilities, JN-1, JN-2, and JN-3 have been demolished as well as JN-6, the guard house. Several outfalls, filter beds, and wells are also located at the site. The MH-7 to MH-A sanitary sewer line connected the WJN site to the original north sanitary filter beds. Figure 1 presents the CCP.

2.1 Area Description

The MH-7 to MH-A sanitary sewer pipe runs east to west connecting the WJN sanitary system to the Abandoned North Filter Bed. The MH-7 to MH-A sanitary sewer line is constructed of six inch diameter vitrified clay pipe. The line is associated with the abandoned north filter bed which is known to be contaminated above the volumetric release limits presented in DD-93-03, Rev. 0, "Volumetric Release Criteria Technical Basis Document for Battelle Columbus Laboratory Decommissioning Project" (Battelle, 1993). For this reason, the pipe was removed and disposed of as low level waste. The location of the MH-7 to MH-A sanitary sewer line is presented as Figure 2.

Two classifications of areas are used in NUREG-5849 and are termed **affected** or **unaffected.** These classifications are defined as (NRC, 1992):

> **Affected Areas:** Areas that have potential radioactive contamination (based on plant operating history) or known radioactive contamination (based on past or preliminary radiological surveillance). This would normally include areas where radioactive materials were used and stored, where records indicate spills or other unusual occurrences that could have resulted in spread of contamination, and where radioactive materials were buried. Areas immediately surrounding or adjacent to locations where radioactive materials were used, stored, or buried are included in this classification because of the potential for inadvertent spread of contamination.
>
> **Unaffected Areas:** All areas not classified as affected. These areas are not expected to contain residual radioactivity, based on knowledge of site history and previous information.

The excavation of the MH-7 to MH-A sanitary sewer line was conducted in both affected and unaffected areas. The base, or floor, of the excavation was considered affected, and the sidewalls were considered unaffected.

3.0 Decommissioning Activities

3.1 Decommissioning Objective

The objective of the final status survey preformed on the MH-7 to MH-A sanitary sewer line was to statistically demonstrate that the remediation of the area was successful and that the excavation is free from residual radioactive contamination that would not make it suitable for unrestricted release. The excavation is determined to be free of residual radioactive contamination when remaining soil contamination levels are below those presented in DD-93-03, Rev. 0, "Volumetric Release Criteria Technical Basis Document for Battelle Columbus Laboratory Decommissioning Project" (Battelle, 1993A). **Table 1** presents the volumetric release criteria as presented in DD-93-03, Rev. 0.

4.0 Final Status Survey Procedures

Planning and implementation of the final status survey of the excavation non-affected and affected areas of the specified section of the MH-7 to MH-A sewer line adhered to the requirements the Final Status Plan (Battelle. 2000) and Work Instruction 2806 (CS. 2004)

4.1 Sampling Parameters

Final status soil samples were taken in the affected base of trench at a frequency of one sample per linear meter. Final status samples of the unaffected sidewalls were taken by dividing the sidewalls into equal sections and sampling each section per Work Instruction 2806 (CS. 2004). Analyses of samples by gamma and alpha spectroscopy were performed by the Onsite Radioanalytical Laboratory (RAL).

4.2 Major Contaminants Identified

The characterization of the MH-7 to MH-A sanitary sewer line identified Cs-137 as the contaminant of concern. Other radioisotopes present include Co-60. Eu-152 and 154, Am-241, Sr-90, and Pu-238 and 239. Cs-137 is used as a surrogate for the other RCOC present in the soils as it typically accounts for 64 percent of the total isotopic activity. Further. the release criteria set for Cs-137 is considered conservative for the decommissioning activities. The surrogate relationship of Cs-137 to other RCOCs was calculated using data presented in **Table 2**. **Table 2** presents the isotopic quantity and activity concentrations of samples collected from the filter bed area by BMI from March through September 2000. These data are not associated with the excavation of the MH-7 to MH-A sewer line. Average activities for the multiple samples were calculated for each RCOC prior to setting the ratios against Cs-137.[1] For each RCOC, the average activity concentration was set as a ratio against the average Cs-137 activity concentration as obtained from previous actions at the filter beds. Cs-137 activity ratios for each RCOC utilized to calculate the RCOCs for the MH-7 to MH-A sewer line are presented at the lower portion of **Table 2**.

4.2.1 Guidelines Established

Table 1 presents the guidelines for residual radioactivity concentrations for soil and solid volumes as applied to the MH-7 to MH-A sanitary line excavation. Criteria for residual radioactivity concentrations in soil are defined in "Volumetric Release Criteria Technical Basis Document for Battelle Columbus Laboratories Decommissioning Project," DD-93-03. (Battelle, 1993). **Table 1** values have been generated primarily from various regulatory requirements. technical documents, and from soil guidelines generated by

[1] Battelle, *Radiological Status of Abandoned Filter Bed Presentation*, http://www.ohio.doe.gov/ccp_seb/. Posted 7/15/2003. Presentation provided by DOE to the CCP website. Page titled "Radioactive Inventory of the Abandoned North Filter Beds & Limit Fractions" contains sampling data obtained from March through September 2000 from the filter beds. Average Cs-137 ratios were utilized to calculate the activity concentrations of the isotopes of concern.

computer pathway analyses. Requirements such as those found in DOE Order 5400.5 have been incorporated into the volumetric release criteria. DOE Order 5400.5, Section IV.a.2, provides generic guidelines for residual concentrations of Ra-226, Ra-228. Th-230, and Th-232 that have been incorporated into the volumetric release criteria. Additionally, NRC Guidance has been received by the CCP establishing the soil radioactivity concentration guidelines for Co-60, Sr-90, Cs-137, Ra-226, and Ra-228, and for natural, enriched and depleted uranium.

Compliance to the cleanup criteria presented in **Table 1** is demonstrated through a "fraction of limit." The total quantity and activity concentration of each RCOC is calculated using the average isotopic ratio listed in **Table 2**, with the exception of the Cs-137 to Pu-241 ratio of 2.8 (obtained from ORIGEN 2.1 derived values, Battelle, 2003b). Calculated results for Co-60, Cs-137, Sr-90, Eu-152 and 154, Pu-239, 240 and 241, and Am-241 are then compared to the respective release criteria and a "fraction of the limit" is calculated. The "fraction of the limit" is determined by summing the ratios of each isotopic concentration to the respective release limit. Summed ratios must be less than one to meet sample release criteria. A modified screening criteria of 11 pCi/g for Cs-137 has been calculated using the "fraction of the limit" obtained from the filter bed surrogate ratio.

Exposure rates were compared to the 5 microRoentgen per hour (μR/hr) above mean background limit listed in DD-97-02, Rev. 0 (Battelle, 2000). Survey measurements are those 1-meter above the ground surface. The calculated mean background exposure rate and the 95 percent confidence intervals used for the CCP open area grounds is 8 ± 2 μR/hr. Compliance to the limit is met when the exposure rate survey is less then or equal to the limits of DD-97-02, Rev. 0 (Battelle, 2000). Initial compliance screening is met if individual exposure rates are less than or equal to 13 μR/hr. Further assessment of compliance allows for exposure rates to be averaged of a 100 m^2 grid area to meet the limit of less than or equal to 5 μR/hr above background at 1-meter above the ground surface. Additionally, exposure rates over any discreet area may not exceed 5 μR/hr above background.

Data collected from trench-like culverts located on Battelle property unassociated with site operations indicate a geometry effect, increasing the background exposure rates inside the trenches by 3 to 5 μR/hr. Trench exposure rate measurements must be less than or equal to 18 μR/hr. The same compliance assessment is applied to these measurements as stated above.

5.0 Equipment and Procedures

5.1 Equipment

Survey instruments sensitive to gamma radiation are used to monitor excavation surfaces for residual radioactive materials. Ludlum Model 44-10 two-inch by two-inch sodium iodide detectors with Eberline ESP-2 meters were used to scan the excavation. Ludlum Model 19 exposure rate meters were used to obtain microRoentgen per hour measurements.

Other instrumentation were used in the Onsite Radioanalytical Laboratory (RAL) to support of the final status survey includes:

- A VMS based Canberra Procount data acquisition system in conjunction with high purity germanium detectors for gamma spectroscopy of soil samples.
- A Tennelec Model LB5100 Simultaneous Alpha and Beta Gas Proportional Counter to count smear samples

5.2 Scanning Minimum Detectable Activities

Scanning minimum detectable concentrations (MDC_{scan}) is determined to demonstrate that the MDC_{scan} is less than the modified Cs-137 cleanup criteria. The MDC_{scan} is calculated utilizing the methodology described in NUREG-1507 and the background count rate and a default detector response to Cs-137 (NRC, 1998). The equation during the walkover surveys of the CCP incorporates a d' of 1.38 and a surveyor efficiency of 0.5. The ambient background in the area was 16.000 counts per minute (cpm). The following is the calculation of the MDC_{scan}:

B_i = (16,000 cpm) x (1 sec) x (1 min/60 sec) = 267 counts

MDCR = (1.38) x ($\sqrt{267\,counts}$) x (60 sec/1min) = 1353 cpm

$MDCR_{surveyor}$ = 1353 cpm/ $\sqrt{0.5}$ = 1913 cpm

MDER = 1913 cpm/(900 cpm/μR/hr) = 2.13 μR/hr

$$MDC_{scan} = (5pCi/g) * \frac{2.13\mu R/hr}{1.307\mu R/hr} = 8.15pCi/g$$

5.3 Procedures

The Characterization Team was formally trained and qualified to applicable procedures prior to the initiation of the characterization and final status surveys. Documentation of training is maintained by CCP Project Records.

The following plans and procedures were utilized for the surveys:

DD-93-19, Rev. 5	Decommissioning Plan, Battelle Memorial Institute Columbus Operations
DD-97-02, Rev. 0	Radiological Characterization and Final Status Plan for BCLDP West Jefferson Site
SC-SP-004.2, Rev. 3	Manual and Mechanical Collection of Surface and Subsurface Soil Samples in Support of Site Characterization
WI-2806	Excavation and Trench Sampling and Surveys

6.0 Survey Findings

6.1 Exposure Rate Surveys

The calculated mean background exposure rate and the 95 percent confidence intervals used for the CCP grounds are 8 ± 2 μR/hr. The exposure rate readings for the excavation are presented in **Table 3**. The exposure rate readings were individually compared to the mean background value of 8 ± 2 μR/hr in order to show compliance with the 5 μR /hr above background release criterion (grounds exposure rate surveys must be less than 13 μR/hr to be compliant, trenches. 16 to 18 μR/hr). The average one meter measurement was 15.5 μR/hr, the minimum measurement was 14 μR/hr and the maximum measurement was 16 μR/hr.

6.2 Excavation Sampling

Samples of the excavation base were taken at a rate of one per linear meter per Section 6.3.3 of DD-97-02, Rev. 0. Ten samples were taken from the sidewalls of the excavation in accordance with Section 6.4.3 of DD-97-02, Rev. 0. A summary table of the Cs-137 results in relation to the sample location is presented as **Table 4**. Sample results for the base and sidewall sampling are presented as **Tables 5 and 6**, respectively. **Tables 5 and 6** present all radionuclides activities and minimum detectable activities of the analyses.

Tables 7 and 8 present the analytical results evaluated against the release criterion presented in **Table 1** of the excavation base and sidewalls, respectively. The total quantity and activity concentrations are calculated using the average isotopic ratios of radionuclides to Cs-137 as obtained for the filter beds, with the exception of Plutonium (Pu)-241 (Battelle, 2003b). Pu-241 is calculated by applying a ratio to sum of Pu-238 and Pu-239 (obtained from ORIGEN 2.1 derived values, Battelle, 2003b), resulting in a Cs-137 to Pu-241 ratio of 2.8. See **Table 2**. Results for cobalt-60, Cs-137, strontium-90, europium-152 and 154, Pu-239, 240 and 241, and americium-241 are compared to the respective release criteria and a "fraction of limit" calculated. The "fraction of limit" was determined by summing the ratios of each isotopic concentration to the respective release limit. The sum of ratios must be less than one to meet sample release criteria. The "fraction of limit" for the MH-7 to MH-A Sewer Line was not calculated due to the low concentrations of Cs-137 in respect to the modified cleanup criteria. The following is a summary Table of the Cs-137 results.

Location	Number of Samples	Average (pCi/g)	Standard Deviation (pCi/g)	Range (pCi/g)	Comparison Value (pCi/g)	Cleanup Criteria (pCi/g)
Excavation Base	30	1.10	2.45	0.02 – 12.3	N/A	11
Excavation Sidewalls	10	0.24	0.50	0.08 – 1.62	0.53	11

Statistical analyses were performed on the sidewall sample data in accordance with Section 6.4.3 of DD-97-02, Rev. 0. The statistical analysis utilizes the guidance in Section 8.5 of NUREG/CR-5849 which utilizes the comparison of the μ_a value (EPA 1989) to relate to a given limit value (CG) at a desired confidence level (i.e., 95 percent) for demonstrating release. The calculation of the Cs-137 comparison value, 0.53 pCi/g, was less than the cleanup criteria of 11 pCi/g. The comparison value is presented as **Table 9**.

6.3 Scanning Measurements

Scanning of the MH-7 to MH-A sanitary line excavation was performed with a two inch by two inch sodium iodide detector. Samples were taken in locations where the DLV (17,980 cpm) was exceeded. Walkover survey results are presented **Table 10**. The corresponding sample results are presented in **Table 4**.

6.4 Overburden Sampling

Twenty samples were taken from the excavation overburden in accordance with Section 6.4.3 of DD-97-02, Rev. 0 and Work Instruction 2806. The overburden soil from ground surface to three feet above the contaminated pipe is designated as overburden "A". The next two feet of soil (from three feet to one foot above the pipe) is designated as overburden "B". A summary table of the Cs-137 results in relation to the sample location is presented as **Table 11**. Sample results for the overburden sampling are presented in **Tables 12 and 13**. The only man-made radionuclide detected was Cs-137. The following is a summary Table of the Cs-137 results.

Location	Number of Samples	Average (pCi/g)	Standard Deviation (pCi/g)	Range (pCi/g)	Comparison Value (pCi/g)	Cleanup Criteria (pCi/g)
Overburden A	10	0.08	0.05	0.04 – 0.20	0.11	11
Overburden B	10	0.14	0.19	0.03 – 0.59	0.25	11

Statistical analyses were performed on the overburden sample data in accordance with Section in the same manner as Section 6.2 of this document. The calculation of the Cs-137 comparison values, 0.11 and 0.25 pCi/g, was less than the cleanup criteria of 11 pCi/g. The calculation is presented as **Tables 14 and 15**.

7.0 Conclusions

The characterization and final status survey results demonstrate that the radiological endpoint criteria objectives of the NRC-approved Decommissioning Plan have been met for the excavation addressed by this effort. (Battelle. 2003) Reported analytical results for media samples obtained from the excavation and overburden used as backfill are below the residual radioactivity concentrations for soil and solid volumes as presented in **Table 1**.

Remaining soil contamination levels are below those presented in DD-93-03. Rev. 0, "Volumetric Release Criteria Technical Basis Document for Battelle Columbus Laboratory Decommissioning Project" (Battelle, 1993A). The decommissioning objective has been satisfied. The final status survey performed on the MH-7 to MH-A Sewer Line statistically demonstrates that the remediation of the area was successful and that the excavation is free from residual radioactive contamination making it suitable for unrestricted release.

8.0 References

American National Standards Institute (ANSI), 1997. ANSI-N323a. "Radiation Protection Instrumentation Test and Calibration."

Battelle, 2003a. "Decommissioning Plan for the Battelle Memorial Institute Columbus Operations," DD-93-19.

Battelle, 2003b. Radiological Status of Abandoned Filter Bed Presentation, http://www.ohio.doe.gov/ccp_seb/, Posted 7/15/2003. Presentation provided by DOE to the CCP website. Page titled "Radioactive Inventory of the Abandoned North Filter Beds & Limit Fractions" contains sampling data obtained from March through September 2000 from the filter beds. Average Cs-137 ratios were utilized to calculate the activity concentrations of the isotopes of concern.

Battelle, 2003c. Waste Characterization, Classification, and Shipping Support Technical Basis Document, Rev. 5 for BCLDP West Jefferson Facility, November 2003. Isotopic mixture for Pu-241 is calculated using the values obtained form the ORIGEN2.1-derived data values presented in the technical basis document.

Battelle, 2000. "Radiological Characterization and Final Status Survey Plan for Battelle Columbus Laboratory Decommissioning Project West Jefferson Site." DD-97-02.

Battelle, 1993. "Volumetric Release Criteria Technical Basis Document for Battelle Columbus Laboratories Decommissioning Project," DD-93-03.

ECC&E2 Closure Services, LLC (Closure Services, 2004). Work Instruction 2806, Rev. 2, Excavation and Trench Sampling and Survey.

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U.S. Department of Energy (DOE), 1986. May 29, 1986 memorandum, Voight to Vaughan, approved by Vaughan, June 10, 1986.

U.S. Nuclear Regulatory Commission (NRC), 1998. "Minimum Detectable Concentrations With Typical Radiation Survey Instruments for Various Contaminants and Field Conditions" NUREG-1507.

Oak Ridge Associated Universities (ORAU). 1992. "Manual for Conducting Radiological Surveys in Support of License Termination, Draft Report for Comment" NUREG/CR-5849, ORAU-92/C57, prepared for the Nuclear Regulatory Commission by the Environmental Survey and Assessment Program, Energy/Environmental Systems Division, ORAU, 1992.

FIGURES

FIGURE 1
SITE MAP

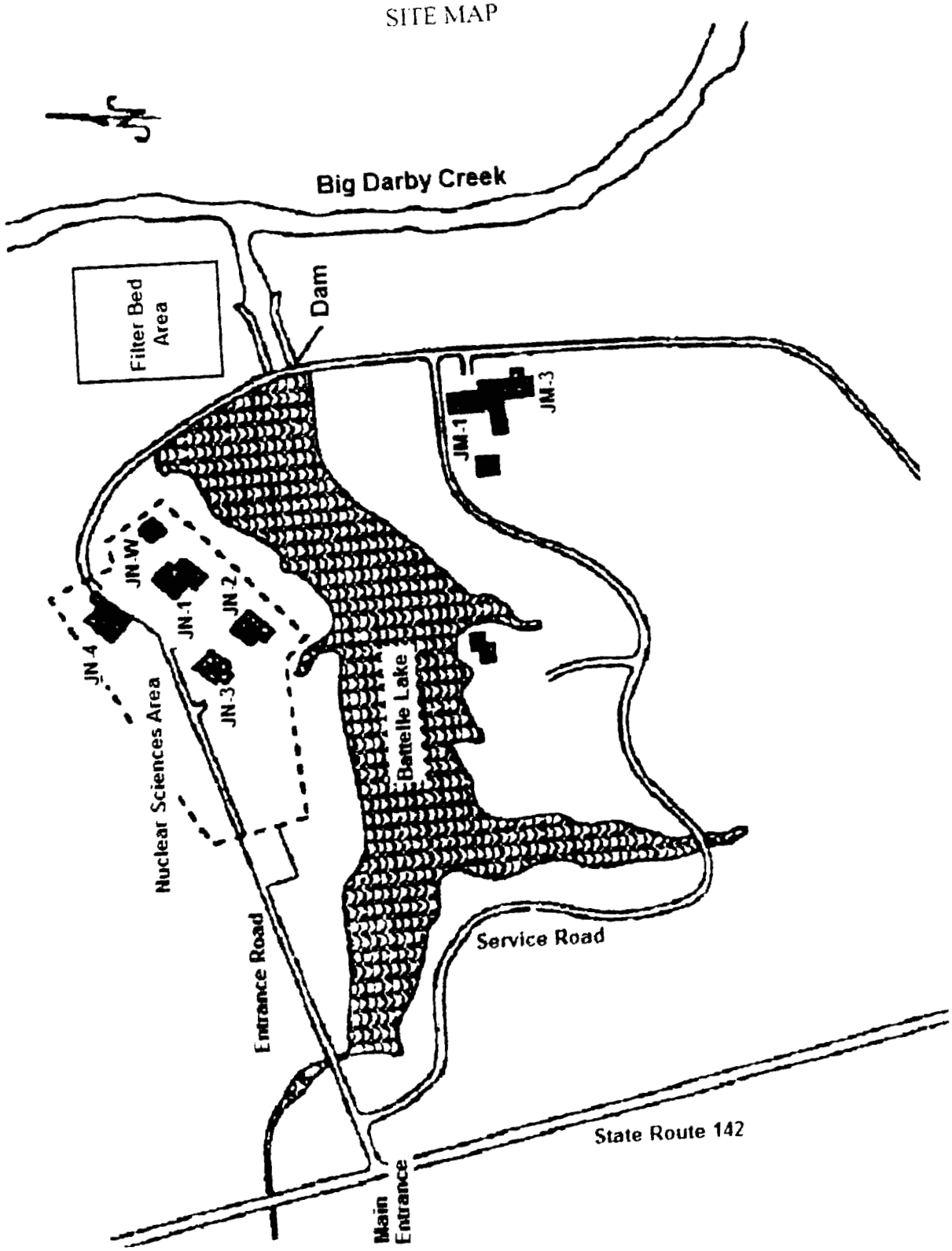
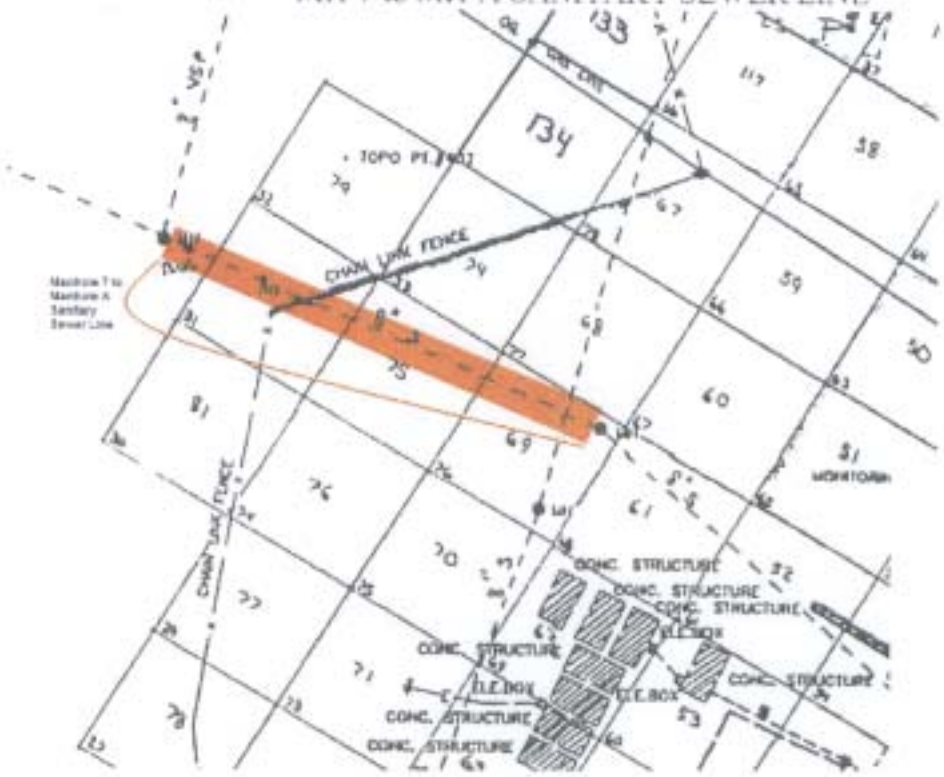


Figure 2

MH-7 to MH-A SANITARY SEWER LINE



TABLES

TABLE 1

BCLDP GUIDELINES FOR RESIDUAL
RADIOACTIVITY CONCENTRATIONS FOR SOIL AND SOLID VOLUMES

Radionuclide[a]	King Avenue Concentration (pCi/g)[b]	West Jefferson Concentration (pCi/g)[b]
Natural Uranium	10[1]	na[c]
Enriched Uranium	30[1]	30[1]
Depleted Uranium	35[1]	35[1]
Ac-227	19	19
Am-241	na[c]	30
Am-243	na	30
Ce-144	na	2.100
Cm-243	na	0.79
Cm-244	na	1.0
Co-60	8[2]	8[2]
Cs-134	na	33
Cs-137	15[2]	15[2]
C-14	940	940
Eu-152	na	36
Eu-154	na	32
Eu-155	na	1,800
Fe-55	na	2.7E+07
H-3[d]	41,000	38,000
I-129	na	13
Mn-54	na	61
Ni-59	na	1.3E+07
Ni-63	na	4.9E+06
Np-237	na	0.58
Pa-231	18	18
Pb-210	140	na
Pu-238	na	25[4]
Pu-239	na	25[4]
Pu-240	na	25[4]
Pu-241	na	25[4]
Pu-242	na	25[4]

Radionuclide[a]	King Avenue Concentration (pCi/g)[b]	West Jefferson Concentration (pCi/g)[b]
Ra-226 (0-15 cm of soil)	5[2,3]	na
Ra-226 (>15 cm of soil)	15[2,3]	na
Ra-228	5[2,3]	na
Ru-106	na	180
Sb-125	na	118
Sm-151	na	6.700
Sr-90	5[2]	5[2]
Th-228	29	na
Th-230	5[3]	na
Th-232	5[3]	na

Table 1 Notes and References

Notes:

a. Activity concentrations above natural background concentrations. Where more than one radionuclide is present, the sum of the ratios of the individual radionuclide concentrations to their respective concentration limits shall not exceed 1.

b. Concentrations for which no specific reference is cited have been derived from RESRAD calculations and are the more restrictive values calculated for soil deposition at a depth of 5 meters.

c. Indicates that this radionuclide is not expected to be found at the indicated site.

d. Difference in tritium activity concentrations are due to the difference in depths of the water tables at two sites. The water table depth at King Avenue is deeper than that at West Jefferson.

References:

1. Options 1 and 2 of the Branch Technical Position, "Disposal or Onsite Storage of Thorium or Uranium Wastes from Past Operations" (46 FR 52061, October 23, 1981).

2. NRC Memorandum, "Acceptable Cleanup Criteria and Practices for Decontamination and Decommissioning (License No. SNM-7)" dated April 17, 1992, to Harley L. Toy, License Coordinator and Manager, Nuclear Sciences, Battelle Memorial Institute from J.W.N. Hickey, Chief, Fuel Cycle Safety Branch, Division of Industrial and Medical Nuclear Safety, Office of Nuclear Material Safety and Safeguards.

3. DOE Order 5400.5, "Radiation Protection of the Public and the Environment".

4. NRC Policy and Guidance Directive FC83-23, "Termination of Byproduct, Source, and Special Nuclear Material Licenses".

Table 2
Cesium-137 Surrogate Analysis Data & Modified Cs-137 Screening Criteria

Sample ID (a,b)	Cs-137 Activity (pCi/g)	Co-60 Activity (pCi/g)	Eu-152 Activity (pCi/g)	Eu-154 Activity (pCi/g)	Am-241 Activity (b) (pCi/g)	Sr-90 Activity (pCi/g)	Pu-238 Activity (pCi/g)	Pu-239 Activity (pCi/g)
16741	40.1	0.05	<0.098	<0.053	1.36 g	<0.172	<0.009	0.053
16746	21.6	0.04	<0.079	<0.051	1.29 a	<0.184	0.026	0.9
16747	26.1	0.06	<0.077	<0.046	0.89 g	<0.175	<0.011	0.116
16751	8	<0.024	<0.068	<0.047	0.93g	<0.151	0.021	0.496
16752	39.1	0.06	<0.086	<0.046	10.74 a	<0.167	0.131	5.822
16607	74.2	0.28	7.26	0.65	1.18 a	0.59	0.0213	0.629
16608	18.7	0.07	4.03	0.26	0.47 a	<0.180	0.016	0.287
16668	41.6	0.08	<0.098	<0.061	2.59 a	NA	0.036	1.846
16686	38.1	0.07	<0.050	<0.031	4.71 a	NA	0.135	3.84
19079	11.7	0.17	8.02	0.64	0.018	4.39	<0.016	0.034
19080	32.4	<0.016	0.562	<0.053	<0.016	0.21	<0.019	<0.017
Average	*31.99*	*0.084*	*1.857*	*0.176*	*2.2*	*0.691*	*0.04*	*1.276*

Calculated Cs-137 Surrogate Ratio (c)	
Cs-137/Co-60	381
Cs-137/Eu-152	17
Cs-137/Eu-154	182
Cs-137Am-241	15
Cs-137/Sr-90	46
Cs-137/Pu-238	800
Cs-137/Pu-239	25
Cs-137/Pu-241 (d)	2.8

Modified Cs-137 Screening Criteria			
Cleanup Criteria (pCi/g)		*Surrogate Activity (pCi/g)*	*Summed Ratio*
Cs-137	15	11	0.73
Co-60	8	0.028884026	0.00
Eu-152	36	0.638543295	0.02
Eu-154	32	0.060518912	0.00
Am-241	30	0.756486402	0.03
Sr-90	5	0.237605502	0.05
Pu-238	25	0.013754298	0.00
Pu-239	25	0.438762113	0.02
Pu-241	25	3.928571429	0.16
		Unity Rule (e)	*1.00*

Notes.

(a) Battelle reported analytical results of samples obtained from the filter bed area between March and September 2000.

(b) Reported data obtained from gamma spectroscopy analysis

(c) Surrogate ratio calculated by dividing average Cs-137 activity by average activity of isotope of concern

(d) Pu-241 is calculated by applying a ratio to sum of Pu-238 and Pu-239 (obtained from ORIGEN 2.1 derived values, Battelle, 2003c), resulting in a Cs-137 to Pu-241 ratio of 2.8.

(e) Unity Rule applied to surrogate calculated activity resulting in modified Cs-137 screening level of 11 pCi/g

TABLE 3
MH-7 TO MH-A DOSE RATE SURVEY
TRENCH

1	
2	
3	16
4	
5	
6	
7	
8	
9	16
10	
11	
12	
13	
14	
15	
16	14
17	
18	
19	
20	
21	
22	
23	16
24	
25	
26	
27	
28	
29	
30	

Results in µR/hr

Table 4

MH-7 to MH-A Excavation Base and Sidewall Soil Result Sumary

SIDE		TRENCH		SIDE	
1	3.09E-02(ND)	1	6.21E-01	1	2.49E-02(ND)
		2	1.22E+00		
		3	7.78E-01		
		4	6.56E-02		
		5	2.44E-02(ND)		
		6	2.15E-02(ND)		
2	7.81E-02	7	2.34E-02(ND)	2	2.47E-02(ND)
		8	3.32E-01		
		9	2.09E-01		
		10	2.04E-01		
		11	1.23E+01		
		12	2.29E-01		
3	4.49E-02(ND)	13	1.62E-02	3	2.86E-02(ND)
		14	7.98E-03		
		15	1.32E+00		
		16	6.32E-01		
		17	1.17E-01		
		18	1.96E-01		
4	4.20E-01	19	2.34E-01	4	4.81E-02(ND)
		20	6.67E-02		
		21	4.90E-01		
		22	9.27E-02		
		23	7.47E-02		
		24	5.89E+00		
5	1.62E+00	25	3.25E+00	5	3.97E-02(ND)
		26	2.83E+00		
		27	9.68E-01		
		28	2.72E-01		
		29	1.87E-01		
		30	2.60E-01		

Cs-137 Results in pCi/g
ND = Non Detect

Table 5
MH-7 to MH-A Excavation Base Soil Analytical Results

Analytical Parameter	RL04-1337-0369			RL04-1338-0370			RL04-1339-0371		
	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)
Be-7	-4.68E-02	1.29E-01	2.18E-01	-2.94E-02	1.33E-01	2.26E-01	-1.59E-02	1.30E-01	2.22E-01
K-40	1.00E+01	1.16E+00	1.81E-01	9.65E+00	1.12E+00	2.12E-01	1.01E+01	1.18E+00	1.82E-01
Co-58	-1.49E-02	1.16E-02	1.81E-02	-6.78E-03	1.23E-02	2.10E-02	-1.37E-02	1.24E-02	2.00E-02
Co-60	-1.76E-02	1.34E-02	2.00E-02	9.96E-04	1.34E-02	2.39E-02	3.09E-03	1.20E-02	2.21E-02
Zn-65	1.52E-03	3.71E-02	5.59E-02	1.78E-02	5.64E-02	5.67E-02	-2.13E-02	3.96E-02	5.54E-02
Sb-125	-7.64E-03	4.10E-02	7.02E-02	-7.58E-03	4.34E-02	7.41E-02	-3.51E-02	4.07E-02	6.70E-02
I-131	-1.16E-02	2.21E-02	3.74E-02	6.33E-03	2.35E-02	4.12E-02	-4.00E-03	2.18E-02	3.76E-02
Cs-134	-1.39E-03	1.32E-02	1.94E-02	2.55E-03	1.48E-02	2.22E-02	3.29E-03	1.42E-02	2.16E-02
Cs-137	6.21E-01	7.66E-02	2.84E-02	1.22E+00	1.38E-01	2.46E-02	7.79E-01	9.14E-02	2.30E-02
Eu-152	1.25E-01	7.90E-02	9.43E-02	2.21E-01	7.82E-02	1.03E-01	9.90E-02	5.96E-02	8.76E-02
Eu-154	8.72E-02	5.48E-02	7.17E-02	1.54E-01	5.35E-02	7.87E-02	5.01E-02	4.11E-02	7.12E-02
Tl-208	1.59E-01	3.09E-02	2.31E-02	1.39E-01	2.86E-02	2.31E-02	1.20E-01	2.94E-02	4.37E-02
Bi-212	6.36E-01	2.77E-01	2.98E-01	3.39E-01	2.28E-01	3.14E-01	6.23E-01	2.39E-01	2.51E-01
Pb-212	4.58E-01	6.45E-02	5.64E-02	3.98E-01	5.78E-02	5.65E-02	4.55E-01	6.01E-02	5.24E-02
Bi-214	1.14E+00	9.26E-02	4.35E-02	1.09E+00	8.76E-02	4.81E-02	1.02E+00	8.46E-02	4.38E-02
Pb-214	1.15E+00	9.85E-02	5.91E-02	1.04E+00	9.34E-02	6.08E-02	9.79E-01	9.24E-02	5.78E-02
Ac-228	5.32E-01	7.42E-02	7.76E-02	4.31E-01	1.03E-01	1.52E-01	5.34E-01	7.60E-02	8.01E-01
Th-234	1.53E+00	2.35E+00	8.98E-01	1.97E+00	2.50E+00	8.94E-01	-1.44E+00	2.40E+00	8.45E-01
U-235	9.09E-02	1.40E-01	5.23E-02	2.30E-02	1.44E-01	5.21E-02	5.54E-02	1.37E-01	5.10E-02
Am-241	-6.22E-03	4.12E-01	7.11E-01	-1.02E-01	4.35E-01	7.43E-01	3.06E-01	4.23E-01	7.44E-01

Analytical Parameter	RL04-1340-0372			RL04-1341-0373			RL04-1342-0374		
	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)
Be-7	-6.91E-02	1.06E-01	1.76E-01	-1.52E-02	9.73E-02	1.68E-01	-2.02E-03	1.08E-01	1.86E-01
K-40	1.12E+01	1.27E+00	1.87E-01	1.13E+01	1.28E+00	1.93E-01	1.12E+01	1.27E+00	1.75E-01
Co-58	-1.91E-02	1.18E-02	1.76E-02	-4.58E-03	1.23E-02	2.13E-02	-7.78E-03	1.11E-02	1.87E-02
Co-60	4.54E-03	1.32E-02	2.41E-02	5.37E-04	1.21E-02	2.16E-02	6.16E-03	1.17E-02	2.20E-02
Zn-65	-2.01E-02	3.50E-02	4.87E-02	-5.75E-03	3.25E-02	4.81E-02	-1.34E-02	3.30E-02	4.72E-02
Sb-125	-4.34E-04	3.35E-02	5.82E-02	1.25E-02	3.32E-02	5.89E-02	1.81E-02	3.33E-02	5.95E-02
I-131	-6.86E-03	1.90E-02	3.25E-02	4.72E-03	1.81E-02	3.21E-02	9.04E-03	1.90E-02	3.39E-02
Cs-134	-7.75E-03	1.29E-02	1.80E-02	2.56E-03	1.23E-02	1.87E-02	2.34E-03	1.21E-02	1.84E-02
Cs-137	6.56E-02	2.32E-02	2.04E-02	8.35E-03	1.37E-02	2.44E-02	-8.28E-03	1.32E-02	2.15E-02
Eu-152	8.23E-03	5.11E-02	7.04E-02	-3.43E-02	5.14E-02	6.72E-02	1.56E-02	4.95E-02	6.58E-02
Eu-154	1.63E-02	3.64E-02	6.23E-02	-1.33E-02	3.55E-02	5.91E-02	4.40E-03	3.45E-02	5.85E-02
Tl-208	1.56E-01	2.99E-02	4.35E-02	1.29E-01	2.72E-02	2.12E-02	1.45E-01	2.84E-02	4.30E-02
Bi-212	7.43E-01	2.96E-01	2.74E-01	4.21E-01	2.42E-01	2.95E-01	4.09E-01	2.79E-01	2.84E-01
Pb-212	4.65E-01	6.04E-02	4.63E-02	5.28E-01	6.11E-02	4.51E-02	4.95E-01	6.28E-02	4.76E-02
Bi-214	7.69E-01	6.96E-02	3.97E-02	8.31E-01	7.56E-02	4.05E-02	8.43E-01	7.13E-02	3.93E-02
Pb-214	8.40E-01	8.10E-02	4.93E-02	8.30E-01	7.96E-02	4.84E-02	8.76E-01	7.91E-02	4.62E-02
Ac-228	4.70E-01	7.12E-02	8.68E-02	4.78E-01	6.71E-02	7.40E-02	5.19E-01	7.31E-02	7.12E-02
Th-234	-5.80E-02	2.02E+00	7.98E-01	7.42E-01	2.01E+00	7.80E-01	-1.78E-01	1.99E+00	7.76E-01
U-235	6.19E-02	1.29E-01	4.51E-02	-9.73E-03	1.28E-01	4.55E-02	5.37E-02	1.23E-01	4.51E-02
Am-241	2.86E-01	3.76E-01	6.64E-01	-1.97E-01	3.55E-01	6.01E-01	8.19E-02	3.64E-01	6.35E-01

Table 5

MH-7 to MH-A Excavation Base Soil Analytical Results

Analytical Parameter	RL04-1343-0375			RL04-1344-0376			RL04-1345-0377		
	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)
Be-7	-6.76E-02	9.74E-02	1.61E-01	-1.18E-01	1.17E-01	1.89E-01	1.98E-02	1.61E-01	2.87E-01
K-40	1.19E+01	1.34E+00	2.03E-01	1.28E+01	1.44E+00	1.84E-01	1.21E+01	1.48E+00	2.36E-01
Co-58	-5.75E-03	1.25E-02	1.83E-02	-1.18E-02	1.28E-02	2.11E-02	-2.50E-02	1.83E-02	2.79E-02
Co-60	-8.08E-03	1.18E-02	1.94E-02	3.21E-03	1.30E-02	2.37E-02	2.07E-04	1.95E-02	3.57E-02
Zn-65	-1.74E-02	3.15E-02	4.40E-02	5.82E-03	3.43E-02	5.28E-02	-2.87E-02	4.99E-02	8.92E-02
Sb-125	8.57E-03	3.43E-02	6.01E-02	1.95E-03	3.94E-02	6.83E-02	1.16E-02	5.45E-02	9.73E-02
I-131	-1.19E-03	1.85E-02	3.22E-02	1.53E-02	2.24E-02	4.01E-02	6.80E-03	3.22E-02	5.78E-02
Cs-134	2.32E-04	1.13E-02	1.68E-02	-7.90E-03	1.40E-02	1.96E-02	2.69E-03	2.00E-02	3.08E-02
Cs-137	4.33E-03	1.35E-02	2.34E-02	3.32E-01	5.15E-02	2.40E-02	2.09E-01	4.40E-02	4.07E-02
Eu-152	-1.23E-03	5.03E-02	6.79E-02	3.28E-03	5.89E-02	7.98E-02	-7.13E-02	8.12E-02	1.11E-01
Eu-154	1.47E-02	3.54E-02	6.04E-02	7.39E-03	4.06E-02	6.88E-02	2.00E-02	5.66E-02	9.77E-02
Tl-208	1.47E-01	2.90E-02	2.13E-02	1.71E-01	3.07E-02	2.40E-02	1.51E-01	3.46E-02	3.01E-02
Bi-212	5.97E-01	2.69E-01	2.51E-01	5.46E-01	2.38E-01	2.91E-01	6.95E-01	4.35E-01	4.32E-01
Pb-212	5.39E-01	6.13E-02	4.39E-02	5.87E-01	6.68E-02	5.08E-02	4.87E-01	8.01E-02	1.29E-01
Bi-214	7.84E-01	7.34E-02	3.75E-02	8.60E-01	7.75E-02	4.44E-02	9.45E-01	1.00E-01	6.66E-02
Pb-214	8.12E-01	7.65E-02	4.80E-02	9.48E-01	8.49E-02	5.48E-02	9.42E-01	1.01E-02	7.56E-02
Ac-228	5.15E-01	7.02E-02	6.88E-02	6.61E-01	8.29E-02	8.11E-02	5.44E-01	1.06E-01	1.19E-01
Th-234	-1.16E-01	1.95E+00	7.71E-01	2.55E+00	2.50E+00	8.68E-01	-1.89E+00	3.14E+00	1.14E+00
U-235	9.88E-02	1.24E-01	4.38E-02	1.45E-01	1.40E-01	4.96E-02	-1.05E-01	1.90E-01	6.73E-02
Am-241	1.29E-01	3.48E-01	6.09E-01	-1.01E-03	3.97E-01	6.86E-01	2.32E-01	5.50E-01	9.82E-01

Analytical Parameter	RL04-1346-0378			RL04-1347-0379			RL04-1476-0504		
	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)
Be-7	7.51E-02	1.71E-01	3.09E-01	-1.23E-01	4.58E-01	7.68E-01	8.91E-03	3.63E-02	6.11E-02
K-40	1.25E+01	1.52E+00	2.79E-01	1.33E+01	1.61E+00	3.05E-01	1.41E+01	1.44E+00	5.62E-02
Co-58	5.61E-03	1.81E-02	3.39E-02	3.27E-02	3.02E-02	5.61E-02	-1.25E-04	4.48E-03	6.62E-03
Co-60	-7.63E-03	1.80E-02	3.10E-02	6.93E-02	2.80E-02	3.30E-02	-3.45E-03	4.57E-03	7.41E-03
Zn-65	6.79E-03	5.30E-02	8.28E-02	3.93E-01	1.44E-01	1.76E-01	-6.36E-03	1.23E-02	1.72E-02
Sb-125	4.19E-03	5.12E-02	9.10E-02	1.08E-01	1.42E-01	2.46E-01	9.89E-03	1.26E-02	2.14E-02
I-131	1.42E-02	3.19E-02	5.78E-02	3.83E-02	7.59E-02	1.32E-01	1.09E-03	4.73E-03	8.03E-03
Cs-134	-1.26E-02	1.92E-02	2.63E-02	-1.10E-02	4.17E-02	5.97E-02	1.26E-03	4.63E-03	6.69E-03
Cs-137	2.04E-01	4.30E-02	3.55E-02	1.23E+01	1.31E+00	6.43E-02	2.29E-01	2.54E-02	7.02E-03
Eu-152	7.25E-03	7.62E-02	1.20E-01	3.40E+00	1.97E-01	1.66E-01	2.84E-02	1.80E-02	2.47E-02
Eu-154	1.48E-02	5.33E-02	9.18E-02	2.65E-01	1.12E-01	1.37E-01	1.51E-02	1.24E-02	2.07E-02
Tl-208	1.63E-01	3.85E-02	6.36E-02	2.56E-01	9.97E-02	9.39E-02	2.04E-01	2.01E-02	7.36E-03
Bi-212	5.52E-01	3.83E-01	4.15E-01	7.03E-01	4.00E-01	7.67E-01	6.66E-01	1.29E-01	9.60E-02
Pb-212	5.45E-01	7.98E-02	7.13E-02	6.11E-01	1.33E-01	1.93E-01	6.62E-01	4.55E-02	1.58E-02
Bi-214	8.46E-01	9.82E-02	5.81E-02	8.74E-01	1.27E-01	1.26E-01	7.31E-01	4.10E-02	1.43E-02
Pb-214	9.06E-01	1.07E-01	7.63E-02	9.71E-01	1.71E-01	1.81E-01	7.72E-01	4.88E-02	1.72E-02
Ac-228	5.86E-01	1.07E-01	1.29E-01	6.06E-01	1.72E-01	2.89E-01	6.47E-01	4.00E-02	2.62E-02
Th-234	1.12E+00	3.07E+00	1.23E+00	-6.65E-01	5.85E+00	2.23E+00	1.62E-01	7.24E-01	2.79E-01
U-235	-1.40E-02	1.92E-01	6.76E-02	1.77E-02	3.72E-01	1.19E-01	9.74E-02	1.49E-02	1.23E-02
Am-241	1.73E-01	5.57E-01	9.87E-01	-4.19E-01	1.09E+00	1.84E+00	-8.30E-02	1.28E-01	2.15E-01

Table 5

MH-7 to MH-A Excavation Base Soil Analytical Results

Analytical Parameter	RL04-1477-0505			RL04-1478-0506			RL04-1351-0383		
	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)
Be-7	-2.02E-02	3.30E-02	5.45E-02	-3.09E-03	3.24E-02	5.41E-02	1.78E-01	2.23E-01	4.05E-01
K-40	1.42E+01	1.45E+00	5.80E-02	1.38E+01	1.41E+00	5.68E-02	1.31E+01	1.60E+00	3.55E-01
Co-58	-1.60E-03	4.22E-03	6.14E-03	-3.32E-03	4.12E-03	5.86E-03	7.42E-03	1.93E-02	3.63E-02
Co-60	-8.46E-04	4.42E-03	7.34E-03	-8.15E-04	4.20E-03	6.97E-03	-5.96E-04	2.14E-02	3.86E-02
Zn-65	-8.16E-03	1.16E-02	1.60E-02	-8.22E-03	1.11E-02	1.53E-02	1.18E-01	5.49E-02	9.28E-02
Sb-125	-1.60E-03	1.16E-02	1.95E-02	-3.97E-03	1.09E-02	1.82E-02	-8.60E-04	6.88E-02	1.20E-01
I-131	9.77E-04	4.56E-03	7.76E-03	2.41E-03	4.43E-03	7.56E-03	-1.09E-02	3.92E-02	6.75E-02
Cs-134	2.88E-04	4.41E-03	6.33E-03	-2.11E-04	4.10E-03	5.86E-03	-2.97E-03	2.35E-02	3.48E-02
Cs-137	1.52E-02	6.21E-03	7.00E-03	7.98E-03	5.26E-03	6.56E-03	1.32E+00	1.65E-01	3.77E-02
Eu-152	1.25E-02	1.67E-02	2.17E-02	-2.47E-03	1.60E-02	2.08E-02	2.54E-01	1.35E-01	1.63E-01
Eu-154	6.68E-03	1.16E-02	1.94E-02	-2.54E-03	1.12E-02	1.86E-02	1.77E-02	9.34E-02	1.19E-01
Tl-208	1.89E-01	1.90E-02	7.04E-03	1.66E-01	1.72E-02	6.55E-03	1.78E-01	4.50E-02	3.71E-02
Bi-212	6.70E-01	1.20E-01	9.47E-02	6.52E-01	1.19E-01	8.94E-02	7.21E-01	3.37E-01	6.59E-01
Pb-212	6.50E-01	4.47E-02	1.46E-02	6.12E-01	4.16E-02	1.40E-02	4.58E-01	8.37E-02	1.41E-01
Bi-214	6.95E-01	4.02E-02	1.34E-02	6.99E-01	3.95E-02	1.27E-02	8.43E-01	9.60E-02	7.59E-02
Pb-214	7.48E-01	4.70E-02	1.61E-02	7.18E-01	4.45E-02	1.56E-02	7.97E-01	1.06E-01	8.85E-02
Ac-228	5.93E-01	3.84E-02	2.56E-02	5.64E-01	3.59E-02	2.41E-02	5.67E-01	1.05E-01	1.22E-01
Th-234	-5.92E-03	6.93E-01	2.71E-01	7.74E-02	5.70E-01	2.56E-01	7.98E-01	3.39E+00	1.42E+00
U-235	1.01E-01	1.58E-02	1.17E-02	3.25E-02	4.05E-02	1.42E-02	3.96E-02	2.13E-01	7.79E-02
Am-241	-7.72E-02	,123	2.07E-01	-1.36E-01	1.17E-01	1.94E-01	-2.43E-01	6.40E-01	1.09E+00

Analytical Parameter	RL04-1352-0384			RL04-1353-0385			RL04-1354-0386		
	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)
Be-7	6.01E-02	1.89E-01	3.37E-01	-5.09E-02	1.61E-01	2.77E-01	5.22E-02	1.61E-01	2.91E-01
K-40	1.28E+01	1.58E+00	2.98E-01	1.47E+01	1.79E+00	3.01E-01	1.28E+01	1.57E+00	3.04E-01
Co-58	-1.60E-02	1.81E-02	2.99E-02	-2.97E-03	1.94E-02	3.49E-02	-1.32E-02	1.78E-02	2.99E-02
Co-60	1.15E-02	1.98E-02	3.87E-02	6.60E-03	1.88E-02	3.63E-02	9.90E-04	1.59E-02	2.99E-02
Zn-65	-3.99E-02	6.26E-02	8.60E-02	2.46E-02	5.10E-02	8.45E-02	1.30E-03	4.94E-02	7.67E-02
Sb-125	1.22E-02	5.83E-02	1.04E-01	-9.30E-03	5.24E-02	9.15E-02	2.21E-02	4.70E-02	8.68E-02
I-131	-3.21E-02	3.56E-02	5.89E-02	3.77E-03	2.93E-02	5.27E-02	-3.85E-03	2.99E-02	5.26E-02
Cs-134	-2.93E-03	2.12E-02	3.14E-02	3.95E-03	1.87E-02	2.95E-02	4.05E-03	1.78E-02	2.81E-02
Cs-137	6.33E-01	8.65E-02	3.84E-02	1.17E-01	4.27E-02	3.67E-02	1.96E-01	4.92E-02	3.48E-02
Eu-152	1.63E-01	1.21E-01	1.29E-01	-4.16E-03	8.16E-02	1.10E-01	2.43E-02	7.35E-02	9.59E-02
Eu-154	1.14E-01	8.37E-02	1.04E-01	2.00E-02	5.65E-02	9.78E-02	-2.09E-02	5.15E-02	8.62E-02
Tl-208	1.74E-01	3.77E-02	3.60E-02	1.87E-01	4.78E-02	7.19E-02	1.57E-01	4.44E-02	6.75E-02
Bi-212	7.32E-01	3.77E-01	4.12E-01	7.39E-01	5.26E-01	4.50E-01	7.43E-01	3.40E-01	4.43E-01
Pb-212	5.75E-01	8.31E-02	7.60E-02	5.50E-01	9.06E-02	1.40E-01	4.80E-01	9.38E-02	1.30E-01
Bi-214	7.05E-01	9.00E-02	6.79E-02	7.92E-01	9.66E-02	6.41E-02	7.60E-01	9.03E-02	6.42E-02
Pb-214	8.12E-01	9.60E-02	8.21E-02	8.45E-01	9.94E-02	7.16E-02	7.97E-01	9.48E-02	7.40E-02
Ac-228	6.55E-01	1.66E-01	2.66E-01	6.25E-01	1.82E-01	2.63E-01	7.82E-01	1.68E-01	2.71E-01
Th-234	-1.42E+00	3.06E+00	1.25E+00	-3.33E-01	3.08E+00	1.33E+00	-1.06E+00	2.84E+00	1.19E+00
U-235	6.92E-02	1.84E-01	7.05E-02	1.07E-02	1.89E-01	6.85E-02	1.60E-01	1.84E-01	6.66E-02
Am-241	-2.24E-03	5.47E-01	9.58E-01	1.50E-03	5.47E-02	9.60E-01	1.62E-01	5.36E-01	9.53E-01

Table 5

MH-7 to MH-A Excavation Base Soil Analytical Results

Analytical Parameter	RL04-1355-0387			RL04-1356-0388			RL04-1357-0389		
	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)
Be-7	-1.61E-01	1.86E-01	3.02E-01	3.90E-03	1.86E-01	3.31E-01	3.38E-02	1.93E-01	3.47E-01
K-40	1.34E+01	1.69E+00	3.46E-01	1.37E+01	1.74E+00	3.72E-01	1.42E+01	1.77E+00	3.52E-01
Co-58	-6.10E-03	1.95E-02	3.48E-02	5.12E-03	2.14E-02	4.04E-02	-1.26E-02	2.20E-02	3.78E-02
Co-60	5.42E-03	2.19E-02	4.19E-02	-1.07E-02	2.20E-02	3.75E-02	6.13E-04	2.21E-02	4.01E-02
Zn-65	-1.89E-02	6.29E-02	9.22E-02	-6.71E-02	6.04E-02	7.08E-02	-1.16E-02	6.00E-02	9.01E-02
Sb-125	1.68E-02	5.88E-02	1.07E-01	-5.75E-03	6.18E-02	1.09E-01	3.96E-02	6.55E-02	1.21E-01
I-131	-2.41E-02	3.19E-02	5.35E-02	-1.33E-02	3.47E-02	6.02E-02	-3.56E-02	3.65E-02	5.99E-02
Cs-134	-2.06E-02	2.05E-02	2.58E-02	-1.32E-02	2.33E-02	3.25E-02	1.18E-02	2.41E-02	3.89E-02
Cs-137	2.34E-01	5.64E-02	3.92E-02	6.67E-02	3.44E-02	3.91E-02	4.91E-01	8.11E-02	4.25E-02
Eu-152	2.08E-02	8.53E-02	1.12E-01	9.65E-03	8.34E-02	1.15E-01	9.58E-02	9.15E-02	1.40E-01
Eu-154	2.86E-03	5.93E-02	1.02E-01	1.93E-02	5.87E-02	1.02E-01	3.37E-02	6.38E-02	1.12E-01
Tl-208	2.10E-01	4.34E-02	8.03E-02	1.94E-01	5.24E-02	3.67E-02	2.31E-01	4.93E-02	4.01E-02
Bi-212	6.93E-01	4.02E-01	4.34E-01	8.29E-01	4.59E-01	4.79E-01	6.31E-01	3.95E-01	5.37E-01
Pb-212	4.48E-01	1.12E-01	1.54E-01	5.78E-01	9.83E-02	1.58E-01	7.11E-01	1.17E-01	1.63E-01
Bi-214	7.15E-01	1.18E-01	1.98E-01	8.24E-01	1.08E-01	6.88E-02	8.28E-01	1.08E-01	8.04E-02
Pb-214	7.12E-01	9.17E-02	9.36E-02	8.77E-01	1.08E-01	8.57E-02	9.06E-01	1.13E-01	9.13E-02
Ac-228	8.22E-01	1.87E-01	3.24E-01	6.74E-01	1.70E-01	3.05E-01	7.27E-01	1.21E-01	1.23E-01
Th-234	-7.87E-01	3.35E+00	1.34E+00	5.13E-01	3.30E+00	1.41E+00	-1.12E+00	3.47E+00	1.46E+00
U-235	1.27E-01	2.07E-01	7.79E-02	8.25E-04	2.19E-01	8.12E-02	-8.43E-02	2.20E-01	7.80E-02
Am-241	-2.70E-01	5.99E-01	1.03E+00	-1.63E-01	5.67E-01	9.85E-01	5.12E-01	6.17E-01	1.13E+00

Analytical Parameter	RL04-1358-0390			RL04-1359-0391			RL04-1360-0392		
	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)
Be-7	-5.84E-02	1.72E-01	2.98E-01	1.87E-03	1.91E-01	3.41E-01	-4.49E-02	3.81E-01	6.50E-01
K-40	1.53E+01	1.91E+00	2.63E-01	1.55E+01	1.92E+00	2.85E-01	1.71E+01	2.11E+00	3.69E-01
Co-58	-1.76E-02	1.97E-02	3.24E-02	-1.32E-04	2.35E-02	4.32E-02	9.01E-03	2.22E-02	4.29E-02
Co-60	1.32E-02	2.10E-02	4.26E-02	3.14E-03	2.36E-02	4.46E-02	2.04E-02	2.82E-02	5.61E-02
Zn-65	1.07E-02	5.44E-02	8.82E-02	2.01E-02	6.68E-02	1.08E-01	-1.04E-01	1.84E-02	1.47E-01
Sb-125	-1.60E-02	5.82E-02	1.01E-01	-4.81E-02	6.01E-02	9.92E-02	-9.24E-02	1.21E-01	2.00E-01
I-131	4.58E-03	3.52E-02	6.34E-02	8.11E-03	3.91E-02	7.07E-02	-2.00E-02	6.45E-02	1.10E-01
Cs-134	1.12E-02	2.01E-02	3.36E-02	-3.00E-03	2.33E-02	3.49E-02	1.37E-02	3.65E-02	5.64E-02
Cs-137	9.27E-02	3.48E-02	4.00E-02	7.47E-02	5.82E-02	3.92E-02	5.90E+00	6.46E-01	6.18E-02
Eu-152	-2.21E-02	8.34E-02	1.11E-01	9.70E-03	8.91E-02	1.26E-01	7.86E-01	1.07E-01	1.99E-01
Eu-154	9.30E-03	5.67E-02	9.81E-02	9.61E-03	6.26E-02	1.08E-01	6.03E-01	1.82E-01	1.75E-01
Tl-208	1.82E-01	5.06E-02	7.98E-02	2.18E-01	4.77E-02	8.63E-02	2.14E-01	6.81E-02	9.72E-02
Bi-212	7.88E-01	5.03E-01	5.53E-01	6.42E-01	3.67E-01	7.32E-01	9.63E-02	4.66E-01	8.15E-01
Pb-212	6.86E-01	1.04E-01	7.34E-02	6.11E-01	1.10E-01	1.72E-01	6.60E-01	1.50E-01	2.07E-01
Bi-214	8.30E-01	1.07E-01	7.10E-02	8.86E-01	1.17E-01	7.39E-02	1.06E+00	1.41E-01	1.15E-01
Pb-214	8.46E-01	1.02E-01	8.45E-02	8.79E-01	1.16E-01	8.84E-02	9.76E-01	1.61E-01	1.49E-01
Ac-228	7.19E-01	1.97E-01	3.18E-01	5.45E-01	2.01E-01	3.10E-01	6.87E-01	2.27E-01	3.52E-01
Th-234	-1.33E+00	3.43E+00	1.36E+00	5.81E-01	3.60E+00	1.48E+00	-3.80E+00	5.46E+00	1.97E+00
U-235	-9.57E-02	2.14E-01	8.25E-02	1.91E-02	2.21E-01	8.40E-02	1.80E-01	3.07E-01	1.15E-01
Am-241	1.06E-01	6.25E-01	1.11E+00	1.23E-01	6.54E-01	1.16E+00	1.27E-02	9.59E-01	1.67E+00

Table 5

MH-7 to MH-A Excavation Base Soil Analytical Results

Analytical Parameter	RL04-1361-0393			RL04-1362-0394			RL04-1363-0395		
	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)
Be-7	-3.41E-02	3.18E-01	5.49E-01	-7.44E-02	3.06E-01	5.22E-01	5.73E-02	2.45E-01	4.37E-01
K-40	1.80E+01	2.23E+00	4.14E-01	1.64E+01	2.07E+00	3.99E-01	1.60E+01	1.97E+00	3.46E-01
Co-58	2.12E-02	2.67E-02	5.21E-02	-1.87E-02	2.78E-02	4.70E-02	-2.19E-02	2.52E-02	4.16E-02
Co-60	-2.57E-04	2.73E-02	5.01E-02	9.08E-03	2.84E-02	5.39E-02	1.03E-02	2.48E-02	4.85E-02
Zn-65	1.17E-01	9.72E-02	1.32E-01	8.25E-02	1.01E-01	1.24E-01	-7.03E-02	8.46E-02	1.11E-01
Sb-125	1.47E-02	9.60E-02	1.69E-01	5.09E-02	9.78E-02	1.75E-01	-3.94E-02	8.06E-02	1.37E-01
I-131	-3.40E-02	5.92E-02	1.00E-01	6.69E-03	5.69E-02	1.00E-01	-3.79E-02	4.83E-02	8.06E-02
Cs-134	-8.75E-03	3.40E-02	4.95E-02	3.62E-04	3.22E-02	4.85E-02	1.04E-02	2.52E-02	4.07E-02
Cs-137	3.25E+00	3.70E-01	5.55E-02	2.83E+00	3.25E-01	5.61E-02	9.68E-01	1.26E-01	4.32E-02
Eu-152	7.25E-01	1.10E-01	1.85E-01	5.66E-01	1.05E-01	1.75E-01	1.79E-01	1.08E-01	1.75E-01
Eu-154	5.20E-01	1.71E-01	1.64E-01	3.38E-01	1.47E-01	1.80E-01	8.40E-02	7.51E-02	1.33E-01
Tl-208	1.73E-01	7.02E-02	9.90E-02	2.80E-01	6.81E-02	1.01E-01	2.47E-01	6.30E-02	9.52E-02
Bi-212	4.61E-01	4.52E-01	8.44E-01	8.87E-01	6.34E-01	7.08E-01	8.44E-01	6.01E-01	6.03E-01
Pb-212	8.20E-01	1.32E-01	1.25E-01	8.55E-01	1.31E-01	1.27E-01	9.32E-01	1.27E-01	9.70E-02
Bi-214	9.99E-01	1.38E-01	1.05E-01	1.17E+00	1.45E-01	1.09E-01	1.20E+00	1.34E-01	9.12E-02
Pb-214	1.09E+00	1.47E-01	1.30E-01	1.15E+00	1.52E-01	1.29E-01	1.17E+00	1.46E-01	1.09E-01
Ac-228	8.61E-01	1.48E-01	1.75E-01	9.56E-01	1.80E-01	3.72E-01	7.45E-01	2.13E-01	3.40E-01
Th-234	6.58E-01	4.67E+00	1.84E+00	1.53E+00	4.86E+00	1.88E+00	1.48E+00	4.08E+00	1.67E+00
U-235	1.11E-01	2.75E-01	1.09E-01	-1.15E-01	2.90E-01	1.09E-01	1.66E-01	7.49E-02	7.99E-02
Am-241	-5.66E-01	8.74E-01	1.48E+00	1.08E-01	8.84E-01	1.55E+00	4.85E-01	7.59E-01	1.37E+00

Analytical Parameter	RL04-1364-0396			RL04-1365-0397			RL04-1366-0398		
	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)
Be-7	-2.20E-02	2.17E-01	3.81E-01	4.01E-02	2.05E-01	3.72E-01	1.05E-02	1.89E-01	3.39E-01
K-40	1.53E+01	1.93E+00	2.93E-01	1.46E+01	1.87E+00	4.50E-01	1.28E+01	1.67E+00	3.34E-01
Co-58	1.98E-03	2.12E-02	3.98E-02	-1.50E-02	2.21E-02	3.76E-02	-1.46E-02	1.85E-02	3.09E-02
Co-60	-1.86E-02	2.36E-02	3.79E-02	-1.78E-02	2.49E-02	4.05E-02	-6.10E-03	2.40E-02	4.26E-02
Zn-65	-4.16E-02	6.79E-02	9.31E-02	1.46E-02	6.72E-02	1.08E-01	-4.26E-03	5.64E-02	8.76E-02
Sb-125	-6.43E-02	7.66E-02	1.26E-01	3.41E-02	6.50E-02	1.21E-01	7.47E-02	6.46E-02	1.25E-01
I-131	-7.34E-03	4.23E-02	7.41E-02	-1.14E-02	3.99E-02	6.97E-02	-6.75E-04	3.76E-02	6.71E-02
Cs-134	6.16E-03	2.62E-02	4.12E-02	-1.11E-02	2.35E-02	3.34E-02	1.65E-02	2.10E-02	3.63E-02
Cs-137	2.72E-01	6.98E-02	4.64E-02	1.87E-01	4.80E-02	4.44E-02	2.60E-01	5.26E-02	4.38E-02
Eu-152	6.02E-02	9.66E-02	1.41E-01	-7.63E-03	9.30E-02	1.27E-01	6.88E-02	8.52E-02	1.18E-01
Eu-154	6.38E-02	6.71E-02	1.20E-01	1.77E-02	6.63E-02	1.15E-01	2.53E-02	5.94E-02	1.04E-01
Tl-208	2.63E-01	5.55E-02	4.84E-02	1.99E-01	4.95E-02	4.00E-02	1.67E-01	5.08E-02	8.21E-02
Bi-212	1.10E+00	6.19E-01	5.50E-01	6.11E-01	4.38E-01	6.48E-01	6.87E-01	5.90E-01	4.89E-01
Pb-212	7.84E-01	1.22E-01	1.91E-01	6.44E-01	1.03E-01	9.17E-02	5.33E-01	9.26E-02	1.59E-01
Bi-214	1.07E+00	1.22E-01	9.44E-02	1.03E+00	1.26E-01	7.40E-02	9.44E-01	1.14E-01	7.80E-02
Pb-214	1.16E+00	1.46E-01	9.22E-02	1.13E+00	1.24E-01	9.07E-02	9.21E-01	1.16E-01	9.29E-02
Ac-228	8.61E-01	2.17E-01	3.60E-01	7.48E-01	2.11E-01	3.55E-01	7.39E-01	1.81E-01	3.14E-01
Th-234	-6.29E-01	3.82E+00	1.61E+00	-1.49E+00	4.02E+00	1.66E+00	4.25E+00	3.94E+00	1.44E+00
U-235	7.21E-02	2.43E-01	9.47E-02	-2.47E-02	2.46E-01	9.17E-02	-3.45E-02	2.19E-01	8.34E-02
Am-241	1.41E-02	6.87E-01	1.21E+00	-2.40E-02	6.89E-01	1.21E+00	-7.87E-01	6.53E-01	1.06E+00

Table 6

MH-7 to MH-A Trench Sidewall Soil Analytical Results

Analytical Parameter	RL04-1382-0399			RL04-1383-0400			RL04-1384-0401		
	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)
Be-7	-3.83E-02	1.16E-01	2.00E-01	-3.42E-02	1.13E-01	1.94E-01	-7.69E-02	1.38E-01	2.31E-01
K-40	1.01E+01	1.22E+00	1.97E-01	1.32E+01	1.52E+00	2.16E-01	1.42E+01	1.64E+00	2.48E-01
Co-58	-1.44E-02	1.39E-02	2.24E-02	-2.54E-02	1.39E-02	1.99E-02	-1.32E-02	1.58E-02	2.63E-02
Co-60	2.97E-03	1.59E-02	2.96E-02	1.34E-02	1.39E-02	2.78E-02	6.26E-04	1.55E-02	2.82E-02
Zn-65	2.72E-02	4.11E-02	6.84E-02	1.84E-03	3.95E-02	6.04E-02	1.86E-02	3.83E-02	6.28E-02
Sb-125	-4.60E-03	4.17E-02	7.30E-02	4.43E-02	4.05E-02	7.52E-02	4.79E-03	4.39E-02	7.76E-02
I-131	-9.86E-03	2.13E-02	3.66E-02	5.33E-03	2.24E-02	3.99E-02	1.58E-02	2.49E-02	4.54E-02
Cs-134	1.52E-03	1.46E-02	2.25E-02	-1.02E-02	1.51E-02	2.08E-02	-3.07E-03	1.62E-02	2.38E-02
Cs-137	-1.77E-02	1.61E-02	2.49E-02	-6.30E-03	1.48E-02	2.47E-02	-1.77E-02	1.81E-02	2.86E-02
Eu-152	-1.10E-02	5.86E-02	8.68E-02	6.30E-03	5.76E-02	7.55E-02	-5.30E-03	6.24E-02	8.13E-02
Eu-154	-2.21E-02	4.09E-02	6.79E-02	-3.44E-02	3.93E-02	6.41E-02	-2.67E-02	4.45E-02	7.36E-02
Tl-208	1.24E-01	3.15E-02	4.85E-02	1.76E-01	3.03E-02	2.50E-02	1.69E-01	3.61E-02	2.70E-02
Bi-212	3.29E-01	3.46E-01	3.48E-01	7.89E-01	3.13E-01	3.08E-01	5.34E-01	4.49E-01	3.81E-01
Pb-212	3.53E-01	6.29E-02	9.84E-02	5.53E-01	6.49E-02	5.15E-02	6.11E-01	7.19E-02	5.80E-02
Bi-214	9.93E-01	9.80E-02	5.03E-02	7.34E-01	7.67E-02	4.59E-02	7.64E-01	8.12E-02	5.11E-02
Pb-214	1.04E+00	9.77E-02	6.14E-02	8.11E-01	7.87E-02	5.82E-02	8.55E-01	8.80E-02	6.06E-02
Ac-228	4.03E-01	1.10E-01	1.85E-01	5.55E-01	1.39E-01	1.95E-01	6.30E-01	8.99E-02	1.13E-01
Th-234	1.46E+00	2.47E+00	1.01E+00	-1.22E+00	2.30E+00	8.99E-01	-3.21E-02	2.48E+00	1.02E+00
U-235	1.84E-01	1.52E-01	6.15E-02	5.23E-02	1.43E-01	5.11E-02	1.79E-01	1.50E-01	5.70E-02
Am-241	-2.57E-01	4.29E-01	7.26E-01	-7.08E-02	4.16E-01	7.19E-01	-6.72E-03	4.41E-01	7.68E-01

Analytical Parameter	RL04-1385-0402			RL04-1386-0403		
	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)
Be-7	4.05E-02	2.12E-01	3.81E-01	4.75E-02	1.41E-01	2.63E-01
K-40	1.47E+01	1.86E+00	3.89E-01	1.24E+01	1.57E+00	3.23E-01
Co-58	-2.43E-02	2.38E-02	3.84E-02	1.17E-02	1.75E-02	3.46E-02
Co-60	4.98E-03	2.29E-02	4.42E-02	-3.04E-03	1.72E-02	3.13E-02
Zn-65	1.99E-02	6.64E-02	1.08E-01	-1.53E-02	4.89E-02	7.36E-02
Sb-125	7.39E-03	6.55E-02	1.18E-01	-9.04E-03	4.94E-02	8.69E-02
I-131	1.61E-02	3.86E-02	7.09E-02	-9.30E-03	3.12E-02	5.44E-02
Cs-134	1.56E-03	2.37E-02	3.67E-02	8.71E-03	1.89E-02	3.10E-02
Cs-137	6.62E-03	3.08E-02	4.81E-02	4.48E-03	2.22E-02	3.97E-02
Eu-152	-4.43E-03	9.42E-02	1.32E-01	-1.21E-02	7.63E-02	1.09E-01
Eu-154	3.57E-02	6.59E-02	1.16E-01	3.65E-02	5.30E-02	9.36E-02
Tl-208	2.42E-01	6.35E-02	3.38E-02	1.58E-01	4.17E-02	3.88E-02
Bi-212	1.16E+00	6.19E-01	5.38E-01	5.55E-01	5.74E-01	4.71E-01
Pb-212	7.05E-01	9.92E-02	8.81E-02	4.44E-01	8.32E-02	1.34E-01
Bi-214	1.37E+00	1.41E-01	8.20E-02	8.35E-01	1.03E-01	3.31E-02
Pb-214	1.24E+00	1.34E-01	1.05E-01	8.15E-01	9.62E-02	7.45E-02
Ac-228	7.21E-01	1.33E-01	1.46E-01	5.85E-02	1.60E-01	2.71E-01
Th-234	2.45E+00	4.02E+00	1.51E+00	1.70E+00	3.06E+00	1.23E+00
U-235	8.90E-02	2.23E-01	8.58E-02	-1.09E-01	1.92E-01	6.93E-02
Am-241	-3.45E-01	7.13E-01	1.22E+00	4.64E-01	5.49E-01	1.00E+00

Table 6

MH-7 to MH-A Trench Sidewall Soil Analytical Results

Analytical Parameter	RL04-1387-0404			RL04-1388-0405			RL04-1389-0406		
	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)
Be-7	-4.28E-02	1.62E-01	2.82E-01	-4.52E-02	1.91E-01	3.32E-01	7.10E-02	1.95E-01	3.55E-01
K-40	1.42E+01	1.75E+00	3.43E-01	1.60E+01	1.98E+00	3.64E-01	1.47E+01	1.82E+00	2.84E-01
Co-58	1.66E-03	2.05E-02	3.82E-02	-5.36E-03	2.30E-02	4.13E-02	7.44E-03	1.88E-02	3.65E-02
Co-60	-1.40E-02	2.23E-02	3.69E-02	-1.22E-02	2.44E-02	4.14E-02	-1.93E-02	2.18E-02	3.42E-02
Zn-65	-3.39E-02	6.10E-02	8.50E-02	4.02E-02	5.86E-02	1.02E-01	-5.22E-02	6.54E-02	8.59E-02
Sb-125	2.35E-02	5.10E-02	9.53E-02	1.75E-02	5.82E-02	1.07E-01	3.24E-03	6.03E-02	1.08E-01
I-131	-6.21E-03	3.32E-02	5.85E-02	-6.27E-03	3.78E-02	6.65E-02	-1.47E-02	3.21E-02	5.55E-02
Cs-134	1.74E-02	1.93E-02	3.37E-02	-8.63E-03	2.26E-02	3.25E-02	-3.95E-04	2.29E-02	3.49E-02
Cs-137	-1.53E-02	1.93E-02	3.09E-02	7.81E-02	4.62E-02	4.76E-02	1.58E-02	2.40E-02	4.49E-02
Eu-152	-1.29E-03	7.93E-02	1.07E-01	3.44E-02	9.13E-02	1.27E-01	-1.35E-03	7.81E-02	1.12E-01
Eu-154	-2.98E-02	5.51E-02	9.18E-02	-1.45E-02	6.27E-02	1.06E-01	-2.43E-02	5.58E-02	9.36E-02
Tl-208	1.98E-01	3.94E-02	7.53E-02	2.03E-01	4.97E-02	4.31E-02	2.32E-01	4.48E-02	8.18E-02
Bi-212	8.87E-01	4.32E-01	4.16E-01	9.03E-01	5.11E-01	5.70E-01	8.66E-01	5.68E-01	5.31E-01
Pb-212	5.13E-01	8.96E-02	1.45E-01	7.12E-01	1.07E-01	8.82E-02	6.67E-01	1.07E-01	1.58E-01
Bi-214	7.04E-01	9.98E-02	7.16E-02	9.42E-01	1.24E-01	6.52E-02	8.72E-01	1.08E-01	6.46E-02
Pb-214	7.52E-01	1.01E-01	7.97E-02	9.68E-01	1.30E-01	9.29E-02	8.66E-01	1.06E-01	8.67E-02
Ac-228	4.56E-01	1.58E-01	2.58E-01	8.57E-01	1.85E-01	3.31E-01	6.56E-01	1.18E-01	1.15E-01
Th-234	7.61E-01	3.25E+00	1.34E+00	-9.28E-01	3.73E+00	1.50E+00	3.12E+00	3.63E+00	1.34E+00
U-235	-4.14E-02	1.91E-01	6.69E-02	-4.93E-02	2.16E-01	8.18E-02	-1.05E-01	1.91E-01	7.83E-02
Am-241	4.75E-02	5.93E-01	1.05E+00	-1.30E-02	6.50E-01	1.14E+00	-4.45E-02	6.27E-01	1.10E+00

Analytical Parameter	RL04-1390-0407			RL04-1391-0408		
	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)
Be-7	1.01E-01	2.01E-01	3.72E-01	2.46E-01	2.55E-01	4.73E-01
K-40	1.57E+01	1.96E+00	2.42E-01	1.54E+01	1.92E+00	3.10E-01
Co-58	-1.99E+02	2.09E-02	3.39E-02	-4.48E-03	2.36E-02	4.24E-02
Co-60	1.33E-02	1.93E-02	4.10E-02	-3.78E-03	2.37E-02	4.26E-02
Zn-65	-7.28E-02	7.05E-02	8.64E-02	-2.31E+02	6.81E-02	9.91E-02
Sb-125	-6.50E-03	6.60E-02	1.16E-01	1.36E-03	7.56E-02	1.33E-01
I-131	-1.18E-02	3.90E-02	6.78E-02	1.03E-02	4.32E-02	7.76E-02
Cs-134	-2.61E-03	2.33E-02	3.51E-02	1.28E-02	2.26E-02	3.73E-02
Cs-137	4.20E-01	7.26E-02	4.89E-02	1.62E+00	2.00E-01	4.68E-02
Eu-152	9.13E-02	9.14E-02	1.38E-01	6.43E-02	1.02E-01	1.74E-01
Eu-154	3.21E-02	6.46E-02	1.13E-01	6.01E-02	7.21E-02	1.27E-01
Tl-208	2.09E-01	5.59E-02	8.73E-02	1.86E-01	5.63E-02	8.70E-02
Bi-212	2.27E-01	3.47E-01	6.47E-01	8.01E-01	4.64E-01	4.93E-01
Pb-212	7.16E-01	1.10E-01	1.73E-01	7.24E-01	1.17E-01	1.79E-01
Bi-214	9.67E-01	1.15E-01	7.58E-02	1.07E+00	1.26E-01	8.09E-02
Pb-214	9.51E-01	1.25E-01	9.89E-02	9.43E-01	1.28E-01	1.07E-01
Ac-228	6.56E-01	1.25E-01	1.57E-01	7.76E-01	2.13E-01	3.33E-01
Th-234	1.12E+00	3.79E+00	1.47E+00	-7.30E-01	4.04E+00	1.65E+00
U-235	1.45E-01	2.23E-01	8.88E-02	1.67E-02	2.44E-01	8.90E-02
Am-241	-2.83E-01	6.82E-01	1.17E+00	-6.69E-01	7.40E-01	1.23E+00

Table 7
MH-7 to MH-A Excavation Base Fraction of Limit Calculations

Analytical Parameter	RL04-1337 369 Result[a] (pCi/g)	RL04-1338 370 Result[a] (pCi/g)	RL04-1339 371 Result[a] (pCi/g)	RL04-1340 372 Result[a] (pCi/g)	RL04-1341 373 Result[a] (pCi/g)	RL04-1342 374 Result[a] (pCi/g)	RL04-1343 375 Result[a] (pCi/g)	RL04-1344 376 Result[a] (pCi/g)	RL04-1345 377 Result[a] (pCi/g)	RL04-1346 378 Result[a] (pCi/g)	RL04-1347 379 Result[a] (pCi/g)	RL04-1476 504 Result[a] (pCi/g)
Co-60	2.00E-02	2.00E-02	2.00E-02	2.00E-02	2.00E-02	2.30E-02	2.00E-02	2.00E-02	4.00E-02	3.00E-02	7.00E-02	1.00E-02
Sr-90[b]	1.35E-02	2.65E-02	1.70E-02	1.52E-03	4.35E-04	4.35E-04	4.35E-04	7.17E-03	4.57E-03	4.35E-03	0.00E+00	6.00E-03
Cs-137	6.20E-01	1.22E+00	7.80E-01	7.00E-02	2.00E-02	2.00E-02	2.00E-02	3.30E-01	2.10E-01	2.00E-01	1.23E+01	2.30E-01
Eu-152	9.00E-02	1.00E-01	9.00E-02	7.00E-02	7.00E-02	7.00E-02	7.00E-02	8.00E-02	1.10E-01	1.20E-01	3.40E+00	3.00E-02
Eu-154	7.00E-02	8.00E-02	7.00E-02	6.00E-02	6.00E-02	6.00E-02	6.00E-02	7.00E-02	1.00E-01	9.00E-02	2.70E-01	2.00E-02
Pu-238[b]	7.75E-04	1.53E-03	8.75E-04	8.75E-05	2.50E-05	2.50E-05	2.50E-05	4.13E-04	2.63E-04	2.50E-04	1.00E-02	2.88E-04
Pu-239[b]	2.48E-02	4.88E-02	3.12E-02	2.80E-03	8.00E-04	8.00E-04	8.00E-04	1.32E-02	8.40E-03	8.00E-03	1.00E-02	9.20E-03
Am-241[b]	4.13E-02	8.13E-02	5.20E-02	4.67E-03	1.33E-03	1.33E-03	1.33E-03	2.20E-02	1.40E-02	1.33E-02	8.20E-01	1.53E-02
Pu-241[c]	2.21E-01	4.38E-01	2.78E-01	2.50E-02	7.14E-03	7.14E-03	7.14E-03	1.18E-01	7.50E-02	7.14E-02	3.71E-01	8.21E-02
Fraction of Limit	5.83E-02	1.12E-01	7.25E-02	9.15E-03	4.69E-03	5.07E-03	4.69E-03	3.24E-02	2.44E-02	2.22E-02	8.81E-01	2.19E-02

[a] Activity Concentration assumed to be the MDA value in absence of a positive result

[b] Estimated based on activity concentration of ratios of specific radiopuclides to Cs-137. See Table 2 for isotopic activity concentration ratio for the abandoned filter beds

[c] Pu-241 is calculated using the values obtained from the DP/QE/42 / derived data values

Table 7
MH-7 to MH-A Excavation Base Fraction of Limit Calculations

Analytical Parameter	RL04-1477 505 Result[a] (pCi/g)	RL04-1478 506 Result[a] (pCi/g)	RL04-1351 383 Result[a] (pCi/g)	RL04-1352 384 Result[a] (pCi/g)	RL04-1353 385 Result[a] (pCi/g)	RL04-1354 386 Result[a] (pCi/g)	RL04-1355 387 Result[a] (pCi/g)	RL04-1356 388 Result[a] (pCi/g)	RL04-1357 389 Result[a] (pCi/g)	RL04-1358 390 Result[a] (pCi/g)	RL04-1359 391 Result[a] (pCi/g)	RL04-1360 392 Result[a] (pCi/g)
Co-60	1.00E-02	1.00E-02	4.00E-02	4.00E-02	4.00E-02	3.00E-02	4.00E-02	4.00E-02	4.00E-02	4.00E-02	5.00E-02	6.00E-02
Sr-90[b]	4.35E-04	2.17E-04	2.87E-02	1.37E-02	2.61E-03	4.35E-03	5.00E-03	1.52E-03	1.07E-02	1.96E-03	1.52E-03	1.10E-01
Cs-137	2.00E-02	1.00E-02	1.32E+00	6.30E-01	1.20E-01	2.00E-01	2.30E-01	7.00E-02	4.90E-01	9.00E-02	7.00E-02	5.89E+00
Eu-152	2.00E-02	2.00E-02	1.60E-01	1.40E-01	1.10E-01	1.00E-01	1.10E-01	1.20E-01	1.40E-01	1.10E-01	1.30E-01	7.90E-01
Eu-154	2.00E-02	2.00E-02	1.10E-01	1.00E-01	1.00E-01	9.00E-02	1.00E-01	1.00E-01	1.10E-01	1.00E-01	1.10E-01	1.80E-01
Pu-238[b]	2.50E-05	1.25E-05	1.65E-03	7.86E-04	1.50E-04	2.50E-04	2.88E-04	8.75E-05	6.13E-04	1.13E-04	8.75E-05	1.00E-02
Pu-239[b]	8.00E-04	4.00E-04	5.28E-02	2.52E-02	4.80E-03	8.00E-03	9.20E-03	2.80E-03	1.96E-02	3.60E-03	2.80E-03	5.00E-02
Am-241[b]	1.33E-03	6.67E-04	8.80E-02	4.20E-02	8.00E-03	1.33E-02	1.53E-02	4.67E-03	3.27E-02	6.00E-03	4.67E-03	3.93E-01
Pu-241[c]	7.14E-03	3.57E-03	4.71E-01	2.25E-01	4.29E-02	7.14E-02	8.21E-02	2.50E-02	1.75E-01	3.21E-02	2.50E-02	2.10E+00
Fraction of Limit	3.16E-03	2.27E-03	1.23E-01	6.19E-02	1.84E-02	2.22E-02	2.62E-02	1.19E-02	4.95E-02	1.37E-02	1.32E-02	5.24E-01

[a] - Activity Concentration assumed to be the MDA value in absence of a positive result

[b] - Estimated based on activity concentration of ratios of specific isotopes to Cs-137. See Table 2 for isotopic activity concentration ratio for the abandoned filter beds

[c] - Pu-241 is calculated using the values obtained from the ORIGEN2 1-derived data values

Table 7
MH-7 to MH-A Excavation Base Fraction of Limit Calculations

Analytical Parameter	RL04-1361-393 Result[a] (pCi/g)	RL04-1362-394 Result[a] (pCi/g)	RL04-1363-395 Result[a] (pCi/g)	RL04-1364-396 Result[a] (pCi/g)	RL04-1365-397 Result[a] (pCi/g)	RL04-1366-398 Result[a] (pCi/g)
Co-60	5.00E-02	5.00E-02	5.00E-02	4.00E-02	4.00E-02	4.00E-02
Sr-90[b]	7.07E-02	6.15E-02	2.11E-02	5.87E-03	4.13E-03	5.65E-03
Cs-137	3.25E+00	2.83E+00	9.70E-01	2.70E-01	1.90E-01	2.60E-01
Eu-152	7.30E-01	5.70E-01	1.80E-01	1.40E-01	1.30E-01	1.20E-01
Eu-154	1.60E-01	1.80E-01	1.30E-01	1.20E-01	1.20E-01	1.00E-01
Pu-238[b]	2.00E-02	3.54E-03	1.21E-03	3.38E-04	2.38E-04	3.25E-04
Pu-239[b]	2.00E-02	1.13E-01	3.88E-02	1.08E-02	7.60E-03	1.04E-02
Am-241[b]	2.30E-01	1.89E-01	6.47E-02	1.80E-02	1.27E-02	1.73E-02
Pu-241[c]	1.16E+00	1.01E+00	3.46E-01	9.64E-02	6.79E-02	9.29E-02
Fraction of Limit	2.95E-01	2.61E-01	9.37E-02	2.99E-02	2.27E-02	2.89E-02

[a] - Activity Concentration assumed to be the MDA value in absence of a positive result

[b] - Estimated, based on activity concentration of ratios of specific isotopes to Cs-137 See Table 2 for isotopic activity concentration ratio for the abandoned filter beds

[c] - Pu-241 is calculated using the values obtained form the ORIGEN2 1-derived data values

Table 8
MH-7 to MH-A Excavation Sidewall Fraction of Limit Calculations

Analytical Parameter	RL04-1382 399 Result[a] (pCi/g)	RL04-1383-400 Result[a] (pCi/g)	RL04-1384 401 Result[a] (pCi/g)	RL04-1385 402 Result[a] (pCi/g)	RL04-1386 403 Result[a] (pCi/g)	RL04-1387 404 Result[a] (pCi/g)	RL04-1388 405 Result[a] (pCi/g)	RL04-1389 406 Result[a] (pCi/g)	RL04-1390 407 Result[a] (pCi/g)	RL04-1391 408 Result[a] (pCi/g)
Co-60	3.00E-02	3.00E-02	3.00E-02	4.00E-02	3.00E-02	4.00E-02	4.00E-02	3.00E-02	4.00E-02	4.00E-02
Sr-90[b]	4.35E-04	4.35E-04	6.52E-04	1.09E-03	8.70E-04	6.52E-04	1.74E-03	8.70E-04	9.13E-03	3.52E-02
Cs-137	2.00E-02	2.00E-02	3.00E-02	5.00E-02	4.00E-02	3.00E-02	8.00E-02	4.00E-02	4.20E-01	1.62E+00
Eu-152	9.00E-02	8.00E-02	8.00E-02	1.30E-01	1.10E-01	1.10E-01	1.30E-01	1.10E-01	1.40E-01	1.70E-01
Eu-154	7.00E-02	6.00E-02	7.00E-02	1.20E-01	9.00E-02	9.00E-02	1.10E-01	9.00E-02	1.10E-01	1.30E-01
Pu-238[b]	2.50E-05	2.50E-05	3.75E-05	6.25E-05	5.00E-05	3.75E-05	1.00E-04	5.00E-05	5.25E-04	2.03E-03
Pu-239[b]	8.00E-04	8.00E-04	1.20E-03	2.00E-03	1.60E-03	1.20E-03	3.20E-03	1.60E-03	1.68E-02	6.48E-02
Am-241[b]	1.33E-03	1.33E-03	2.00E-03	3.33E-03	2.67E-03	2.00E-03	5.33E-03	2.67E-03	2.80E-02	1.08E-01
Pu-241[c]	7.14E-03	7.14E-03	1.07E-02	1.79E-02	1.43E-02	1.07E-02	2.86E-02	1.43E-02	1.50E-01	5.79E-01
Fraction of Limit	6.03E-03	5.97E-03	6.90E-03	1.03E-02	7.94E-03	8.30E-03	1.29E-02	7.94E-03	4.32E-02	1.50E-01

[a] - Activity Concentration assumed to be the MDA value in absence of a positive result

[b] - Estimated, based on activity concentration of ratios of specific isotopes to Cs-137 See Table 2 for isotopic activity concentration ratio for the abandoned filter beds

[c] - Pu-241 is calculated using the values obtained form the ORIGEN2 1-derived data values

Table 9

EXCAVATION SIDEWALL COMPARISON VALUE CALCULATION

Area/Volume ID		Number of Data Points	t95% (n-1) Value from Table B-1 of NUREG/CR-5849
MH-7 to MH-A Trench	Sidewall Soil	10	1.833

	Sample Number	Cs-137 Result (pCi/g)
1	1382-399	0.02
2	1383-400	0.02
3	1384-401	0.03
4	1385-402	0.05
5	1386-403	0.04
6	1387-404	0.03
7	1388-405	0.08
8	1389-406	0.04
9	1390-407	0.42
10	1391-408	1.62

Average	Comparison Value
0.24	0.53
Standard Deviation	**Modified Cleanup Criteria**
0.50	11
	Comparison < Criteria
	Yes

Table 10
MH-7 to MH-A Trench Walkover Scan Results

SIDE		TRENCH		SIDE	
1	15.4K	1	19.5K	1	15.9K
		2	16.1K		
		3	15.8K		
		4	16.4K		
		5	16.8K		
		6	16.2K		
2	18.1K	7	16.0K	2	15.0K
		8	16.6K		
		9	16.9K		
		10	17.7K		
		11	17.4K		
		12	18.2K		
3	17.1K	13	16.7K	3	15.3K
		14	16.3K		
		15	16.5K		
		16	15.3K		
		17	15.2K		
		18	14.8K		
4	15.3K	19	14.3K	4	15.7K
		20	15.7K		
		21	14.7K		
		22	15.0K		
		23	15.1K		
		24	17.3K		
5	16.7K	25	16.7K	5	16.6K
		26	16.9K		
		27	17.4K		
		28	17.6K		
		29	17.2K		
		30	15.2K		

Background = 16.0K

Table 11
MH-7 to MH-A Overburden Soil Result Summary

	OVERBURDEN B		OVERBURDEN A
1	5.63E-02(ND)	1	1.10E-01
2	5.87E-01	2	1.99E-01
3	1.47E-01	3	1.23E-01
4	3.66E-01	4	4.33E-02(ND)
5	4.63E-02(ND)	5	4.53E-02(ND)
6	4.19E-02(ND)	6	5.70E-02
7	4.0E-02(ND)	7	5.47E-02(ND)
8	4.06E-02(ND)	8	4.31E-02(ND)
9	2.69E-02(ND)	9	6.56E-02
10	2.84E-02(ND)	10	6.17E-02

Cs-137 Results in pCi/g
ND = Non Detect

Table 12

MH-7 to MH-A Overburden A Analytical Results

Analytical Parameter	RL04-1227-0305			RL04-1228-0306			RL04-1229-0307		
	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)
Be-7	-3.08E-01	1.92E-01	2.79E-01	1.07E-01	2.28E-01	4.21E-01	-9.77E-02	1.92E-01	3.26E-01
K-40	1.39E+01	1.80E+00	3.37E-01	1.48E+01	1.89E+00	3.40E-01	1.43E+01	1.82E+00	3.10E-01
Co-58	-1.28E-02	2.47E-02	4.29E-02	-2.11E-02	2.20E-02	3.55E-02	1.41E-03	2.26E-02	4.20E-02
Co-60	-2.81E-03	2.68E-02	4.39E-02	-8.63E-03	2.50E-02	4.45E-02	-1.07E-03	2.21E-02	4.10E-02
Zn-65	-2.17E-02	6.11E-02	8.94E-02	-3.81E-02	7.12E-02	9.95E-02	-5.40E-02	6.70E-02	8.72E-02
Sb-125	-3.88E-02	7.34E-02	1.25E-01	7.24E-02	6.86E-02	1.33E-01	3.24E-02	6.74E-02	1.24E-01
I-131	1.59E-02	3.78E-02	6.96E-02	-8.52E-03	3.62E-02	6.37E-02	-2.07E-02	3.43E-02	5.82E-02
Cs-134	-1.46E-02	2.30E-02	3.15E-02	-8.56E-03	2.52E-02	3.67E-02	2.75E-03	2.35E-02	3.67E-02
Cs-137	1.10E-01	4.03E-02	5.43E-02	1.99E-01	5.95E-02	5.48E-02	1.23E-01	5.74E-02	4.70E-02
Eu-152	3.66E-02	9.55E-02	1.40E-01	-3.52E-02	9.55E-02	1.46E-01	-2.10E-03	9.28E-02	1.34E-01
Eu-154	-2.68E-03	6.84E-02	1.17E-01	4.78E-03	6.75E-02	1.17E-01	5.09E-02	6.61E-02	1.17E-01
Tl-208	2.25E-01	6.04E-02	9.59E-02	1.77E-01	5.39E-02	4.35E-02	2.25E-01	5.94E-02	9.22E-02
Bi-212	3.68E-01	3.65E-01	7.07E-01	1.08E+00	5.65E-01	6.98E-01	1.31E+00	6.18E-01	4.80E-01
Pb-212	7.03E-01	1.12E-01	8.90E-02	6.83E-01	1.15E-01	1.88E-01	6.88E-01	1.12E-01	8.46E-02
Bi-214	1.18E+00	1.29E-01	6.67E-02	9.65E-01	1.32E-01	7.44E-02	1.13E+00	1.27E-01	7.72E-02
Pb-214	1.12E+00	1.45E-01	1.00E-01	1.10E+00	1.39E-01	9.81E-02	1.10E+00	1.30E-01	9.65E-02
Ac-228	8.93E-01	1.42E-01	1.62E-01	7.11E-01	1.83E-01	3.36E-01	7.26E-01	1.92E-01	3.35E-01
Th-234	-4.96E-01	4.02E+00	1.65E+00	2.21E+00	4.14E+00	1.68E+00	2.17E-02	2.23E+00	1.50E+00
U-235	5.84E-02	2.51E-01	9.59E-02	9.57E-02	2.40E-01	9.64E-02	-1.07E-02	2.23E-01	8.81E-02
Am-241	2.65E-01	6.78E-01	1.22E+00	-7.79E-03	7.25E-01	1.28E+00	-1.20E-01	6.83E-01	1.19E+00

Analytical Parameter	RL04-1230-0308			RL04-1231-0309			RL04-1232-0310		
	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)
Be-7	-7.99E-03	1.81E-01	3.21E-01	-9.98E-02	1.71E-01	2.88E-01	-4.31E-02	1.88E-01	3.28E-01
K-40	1.35E+01	1.71E+00	2.77E-01	1.27E+01	1.65E+00	3.33E-01	1.38E+01	1.76E+00	3.82E-01
Co-58	-5.12E-03	1.88E-02	3.38E-02	-1.06E-02	2.19E-02	2.81E-02	-8.29E-03	2.16E-02	3.82E-02
Co-60	-1.08E-02	1.86E-02	3.13E-02	4.12E-03	2.73E-02	4.56E-02	-1.51E-02	2.38E-02	3.94E-02
Zn-65	1.32E-02	6.23E-02	9.95E-02	-8.00E-03	6.31E-02	9.57E-02	-3.50E-02	6.55E-02	9.15E-02
Sb-125	9.16E-03	5.79E-02	1.05E-01	4.00E-02	5.98E-02	1.12E-01	-1.45E-02	7.01E-02	1.22E-01
I-131	1.54E-02	3.16E-02	5.85E-02	-1.83E-03	2.91E-02	5.21E-02	1.89E-03	3.41E-02	6.14E-02
Cs-134	-6.53E-03	2.01E-02	2.94E-02	-8.73E-04	2.12E-02	3.24E-02	-1.63E-02	2.35E-02	3.19E-02
Cs-137	1.42E-02	2.32E-02	4.33E-02	1.35E-02	2.45E-02	4.53E-02	5.70E-02	3.34E-02	4.89E-02
Eu-152	5.85E-02	8.73E-02	1.16E-01	1.05E-01	8.90E-02	1.23E-01	-4.15E-02	9.38E-02	1.35E-01
Eu-154	1.74E-02	6.08E-02	1.05E-01	3.47E-02	6.09E-02	1.07E-01	-4.64E-02	6.71E-02	1.11E-01
Tl-208	2.25E-01	4.65E-02	4.19E-02	1.67E-01	5.13E-02	7.69E-02	1.66E-01	4.57E-02	8.09E-01
Bi-212	9.95E-01	4.04E-01	4.38E-01	8.11E-01	5.72E-01	5.42E-01	5.62E-01	6.06E-01	5.97E-01
Pb-212	6.60E-01	1.00E-01	8.08E-02	5.99E-01	9.66E-02	1.59E-01	6.34E-01	1.05E-01	1.78E-01
Bi-214	7.83E-01	1.06E-01	6.06E-02	1.04E+00	1.21E-01	6.61E-02	1.14E+00	1.28E-01	7.79E-02
Pb-214	8.26E-01	1.11E-01	7.60E-02	1.16E+00	1.25E-01	8.84E-02	1.30E+00	1.47E-01	8.78E-02
Ac-228	6.33E-01	2.13E-01	3.11E-01	6.44E-01	2.05E-01	3.09E-01	7.54E-01	2.02E-01	3.37E-01
Th-234	5.54E-01	3.41E+00	1.27E+00	2.68E-02	3.60E+00	1.45E+00	3.25E+00	3.97E+00	1.55E+00
U-235	-2.50E-01	2.02E-01	8.26E-02	-1.24E-01	2.11E-01	8.13E-02	1.06E-01	2.29E-01	8.91E-02
Am-241	-2.28E-01	6.08E-01	1.05E+00	-4.25E-01	6.80E-01	1.15E+00	-2.74E-01	6.66E-01	1.15E+00

Table 12

MH-7 to MH-A Overburden A Analytical Results

Analytical Parameter	RL04-1233-0311			RL04-1234-0312			RL04-1235-0313		
	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)
Be-7	7.20E-02	1.93E-01	3.57E-01	6.56E-02	1.98E-01	3.61E-01	4.74E-02	2.05E-01	3.72E-01
K-40	1.43E+01	1.81E+00	3.40E-01	1.29E+01	1.67E+00	3.50E-01	1.37E+01	1.75E+00	3.70E-01
Co-58	-1.90E-02	2.07E-02	3.39E-02	-1.66E-02	2.09E-02	3.49E-02	1.16E-02	2.06E-02	4.09E-02
Co-60	2.55E-02	2.52E-02	4.92E-02	-4.99E-03	2.42E-02	4.32E-02	2.57E-02	2.50E-02	5.15E-02
Zn-65	-2.80E-02	6.17E-02	8.79E-02	-4.20E-02	6.36E-02	8.61E-02	4.09E-03	5.43E-02	8.76E-02
Sb-125	1.55E-02	6.35E-02	1.16E-01	1.76E-02	6.42E-02	1.17E-01	-7.08E-02	6.76E-02	1.09E-01
I-131	1.58E-02	3.63E-02	6.68E-02	-1.94E-02	3.43E-02	5.84E-02	1.65E-02	3.33E-02	6.21E-02
Cs-134	7.89E-03	2.18E-02	3.56E-02	8.66E-03	2.47E-02	3.94E-02	7.26E-03	2.54E-02	4.04E-02
Cs-137	1.31E-02	3.03E-02	5.47E-02	-2.00E-03	2.46E-02	4.31E-02	6.56E-02	3.57E-02	4.63E-02
Eu-152	-1.16E-02	9.19E-02	1.41E-01	-3.28E-02	8.84E-02	1.27E-01	5.47E-02	9.78E-02	1.30E-01
Eu-154	-1.24E-02	6.42E-02	1.09E-01	-9.86E-03	6.20E-02	1.05E-01	3.96E-02	6.88E-02	1.21E-01
Tl-208	2.03E-01	5.06E-02	8.63E-02	2.12E-01	4.86E-02	3.46E-02	2.04E-01	5.09E-02	4.14E-02
Bi-212	7.06E-01	5.03E-01	6.04E-01	6.03E-01	3.69E-01	5.24E-01	9.24E-01	4.75E-01	6.29E-01
Pb-212	8.10E-01	1.16E-01	8.28E-02	6.38E-01	1.02E-01	9.25E-02	6.65E-01	9.81E-02	9.31E-02
Bi-214	1.10E+00	1.29E-01	7.20E-02	1.12E+00	1.25E-01	7.99E-02	1.22E+00	1.42E-01	4.25E-02
Pb-214	1.02E-01	1.28E-01	1.00E-01	1.18E+00	1.33E-01	9.03E-02	1.20E+00	1.41E-01	1.06E-01
Ac-228	9.35E-01	1.42E-01	1.31E-01	7.41E-01	1.73E-01	3.19E-01	6.86E-01	1.97E-01	3.28E-01
Th-234	9.62E-02	3.73E+00	1.53E+00	2.20E+00	3.96E+00	1.49E+00	1.55E+00	3.93E+00	1.57E+00
U-235	1.29E-01	2.29E-01	8.82E-02	3.11E-02	2.29E-01	8.54E-02	-7.40E-03	2.37E-01	9.20E-02
Am-241	4.19E-01	6.93E-01	1.26E+00	1.42E-01	7.13E-01	1.26E+00	9.48E-03	7.25E-01	1.28E+00

Analytical Parameter	RL04-1236-0314		
	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)
Be-7	-9.09E-02	2.02E-01	3.43E-01
K-40	1.39E+01	1.77E+00	3.58E-01
Co-58	-5.44E-03	2.14E-02	3.85E-02
Co-60	3.81E-04	2.63E-02	4.82E-02
Zn-65	2.30E-02	5.31E-02	9.10E-02
Sb-125	-1.69E-02	6.29E-02	1.10E-01
I-131	3.98E-02	3.58E-02	6.87E-02
Cs-134	8.48E-03	2.27E-02	3.69E-02
Cs-137	6.17E-02	2.88E-02	4.81E-02
Eu-152	1.17E-01	9.53E-02	1.23E-01
Eu-154	5.47E-02	6.67E-02	1.18E-01
Tl-208	1.89E-01	5.45E-02	8.48E-02
Bi-212	1.03E+00	3.76E-01	7.86E-01
Pb-212	6.55E-01	1.06E-01	1.09E-01
Bi-214	1.09E+00	1.24E-01	7.80E-02
Pb-214	1.11E+00	1.33E-01	8.93E-02
Ac-228	5.65E-01	2.02E-01	3.04E-01
Th-234	1.54E+00	3.97E+00	1.48E+00
U-235	1.18E-01	2.17E-01	8.99E-02
Am-241	-3.11E-01	7.02E-01	1.20E+00

Table 13

MH-7 to MH-A Overburden B Analytical Results

Analytical Parameter	RL04-1237-0315			RL04-1238-0316			RL04-1239-0317		
	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)
Be-7	-1.59E-01	2.36E-01	3.93E-01	-7.45E-02	2.42E-01	4.18E-01	1.09E-01	1.99E-01	3.70E-01
K-40	1.55E+01	2.03E+00	5.11E-01	1.69E+01	2.13E+00	3.98E-01	1.41E+01	1.78E+00	3.37E-01
Co-58	-1.89E-02	2.76E-02	4.68E-02	-2.38E-02	2.44E-02	3.95E-02	4.07E-04	2.37E-02	4.35E-02
Co-60	3.49E-02	3.05E-02	6.44E-02	-6.49E-03	2.24E-02	4.02E-02	1.96E-03	2.04E-02	3.91E-02
Zn-65	2.52E-03	7.19E-02	1.14E-01	-2.19E-02	7.99E-02	1.18E-01	2.09E-02	6.16E-02	1.01E-01
Sb-125	8.09E-03	7.13E-02	1.30E-01	-7.19E-03	7.99E-02	1.41E-01	4.64E-02	5.93E-02	1.13E-01
I-131	-1.92E-03	4.07E-02	7.28E-02	-1.30E-02	4.18E-02	7.28E-02	-6.61E-03	3.57E-02	6.28E-02
Cs-134	-1.82E-05	2.78E-02	4.30E-02	-8.30E-03	2.99E-02	4.37E-02	1.38E-02	2.24E-02	3.75E-02
Cs-137	1.97E-02	2.96E-02	5.63E-02	5.87E-01	9.60E-02	5.09E-02	1.47E-01	6.58E-02	4.03E-02
Eu-152	-9.39E-03	1.03E-01	1.27E-01	-2.70E-02	1.08E-01	1.82E-01	-1.67E-02	9.48E-02	1.36E-01
Eu-154	-1.89E-02	7.16E-02	1.22E-01	-5.31E-02	7.55E-02	1.24E-01	-1.38E-02	6.68E-02	1.13E-01
Tl-208	2.64E-01	6.08E-02	4.70E-02	2.78E-01	6.29E-02	1.05E-01	2.09E-01	5.16E-02	8.73E-02
Bi-212	6.93E-01	4.69E-01	9.23E-01	3.95E-01	4.72E-01	8.76E-01	1.06E+00	5.55E-01	5.35E-01
Pb-212	8.12E-01	1.24E-01	9.87E-02	8.62E-01	1.36E-01	2.11E-01	6.94E-01	1.06E-01	8.60E-02
Bi-214	1.00E+00	1.34E-01	8.23E-02	1.04E+00	1.42E-01	9.30E-02	1.07E+00	1.25E-01	7.19E-02
Pb-214	1.17E+00	1.42E-01	1.19E-01	1.10E+00	1.50E-01	1.13E-01	1.10E+00	1.26E-01	9.57E-02
Ac-228	8.84E-01	2.33E-01	4.11E-01	7.84E-01	2.23E-01	3.70E-01	7.06E-01	1.27E-01	1.28E-01
Th-234	-2.67E+00	4.67E+00	1.76E+00	-4.24E-01	4.25E+00	1.75E+00	7.51E-01	3.54E+00	1.46E+00
U-235	2.08E-01	2.44E-01	9.91E-01	1.21E-01	2.59E-01	9.94E-02	6.50E-02	2.29E-01	8.32E-02
Am-241	1.23E-01	8.42E-01	1.50E+00	-1.43E-02	7.55E-01	1.33E+00	3.36E-01	6.70E-01	1.21E+00

Analytical Parameter	RL04-1240-0318			RL04-1241-0319			RL04-1242-0320		
	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)
Be-7	-7.09E-02	2.52E-01	4.36E-01	7.78E-03	1.86E-01	3.34E-01	-8.66E-02	1.81E-01	3.08E-01
K-40	2.04E+01	2.52E+00	4.15E-01	1.27E+01	1.67E+00	3.08E-01	1.29E+01	1.66E+00	3.38E-01
Co-58	-3.80E-02	2.97E-02	4.56E-02	-1.22E-02	2.11E-02	2.64E-02	-3.14E-03	2.05E-02	3.74E-02
Co-60	-2.60E-03	3.04E-02	5.55E-02	2.29E-02	2.61E-02	4.79E-02	1.61E-02	2.08E-02	4.39E-02
Zn-65	2.79E-02	8.64E-02	1.40E-01	-3.62E-03	6.56E-02	1.01E-01	-7.22E-03	6.39E-02	9.75E-02
Sb-125	2.87E-02	8.34E-02	1.53E-01	-3.98E-02	6.24E-02	1.05E-01	-5.43E-02	6.20E-02	1.02E-01
I-131	1.55E-03	4.59E-02	8.21E-02	-4.04E-02	3.65E-02	5.90E-02	1.43E-02	3.54E-02	6.51E-02
Cs-134	2.22E-02	2.94E-02	5.00E-02	-3.59E-02	2.69E-02	3.21E-02	-2.67E-02	2.52E-02	3.18E-02
Cs-137	3.66E-01	7.39E-02	5.43E-02	3.10E-03	2.60E-02	4.63E-02	-5.08E-03	2.42E-02	4.19E-02
Eu-152	8.91E-02	1.20E-01	1.96E-01	4.60E-02	8.85E-02	1.27E-01	-3.80E-02	8.73E-02	1.21E-01
Eu-154	5.38E-02	8.54E-02	1.50E-01	1.63E-02	6.17E-02	1.07E-01	-3.63E-02	6.22E-02	1.03E-01
Tl-208	3.05E-01	7.53E-02	1.17E-01	1.86E-01	5.21E-02	8.38E-02	1.68E-01	4.90E-02	8.23E-02
Bi-212	1.35E+00	5.34E-01	7.98E-01	5.38E-01	3.52E-01	7.02E-01	9.70E-01	4.66E-01	4.27E-01
Pb-212	9.34E-01	1.39E-01	1.13E-01	6.23E-01	9.92E-02	8.68E-02	4.81E-01	9.25E-02	1.05E-01
Bi-214	1.50E+00	1.65E-01	9.44E-02	1.12E+00	1.29E-01	8.05E-02	1.04E+00	1.21E-01	5.98E-02
Pb-214	1.43E+00	1.66E-01	1.26E-01	1.08E+00	1.22E-01	9.24E-02	1.12E+00	1.37E-01	9.45E-02
Ac-228	1.06E+00	1.68E-01	2.19E-01	7.72E-01	1.74E-01	3.24E-01	5.70E-01	1.71E-01	3.02E-01
Th-234	-3.87E-01	4.73E+00	2.01E+00	2.48E+00	3.84E+00	1.49E+00	2.29E+00	3.80E+00	1.44E+00
U-235	2.11E-01	2.86E-01	1.17E-01	1.31E-01	2.21E-01	8.85E-02	1.92E-01	2.14E-01	9.29E-02
Am-241	4.57E-01	8.33E-01	1.51E+00	-1.67E-01	6.85E-01	1.19E+00	-6.07E-01	6.79E-01	1.13E+00

Table 13

MH-7 to MH-A Overburden B Analytical Results

Analytical Parameter	RL04-1243-0321			RL04-1244-0322			RL04-1245-0323		
	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)
Be-7	-6.52E-02	1.95E-01	3.36E-01	-4.06E-02	2.05E-01	3.57E-01	-2.06E-02	1.27E-01	2.19E-01
K-40	1.29E+01	1.65E+00	3.80E-01	1.25E+01	1.61E+00	3.32E-01	1.30E+01	1.52E+00	2.20E-01
Co-58	-3.88E-02	2.39E-02	3.43E-02	-1.40E-02	1.91E-02	3.22E-02	6.34E-04	1.72E-02	3.08E-02
Co-60	-1.59E-03	2.35E-02	4.30E-02	-1.00E-03	2.45E-02	4.49E-02	-3.54E-03	1.70E-02	2.97E-02
Zn-65	-2.02E-02	6.56E-02	9.63E-02	1.17E-02	4.88E-02	8.19E-02	2.17E-02	3.51E-02	5.90E-02
Sb-125	-8.32E-02	6.28E-02	9.76E-02	-2.19E-02	5.60E-02	9.69E-02	7.83E-05	4.57E-02	7.99E-02
I-131	9.29E-04	3.15E-02	5.67E-02	-1.99E-02	3.20E-02	5.43E-02	2.95E-02	2.40E-02	4.49E-02
Cs-134	-1.90E-04	2.24E-02	3.45E-02	-1.28E-02	2.30E-02	3.21E-02	-1.29E-02	1.70E-02	2.31E-02
Cs-137	-9.09E-03	2.36E-02	4.00E-02	-1.22E-05	2.29E-02	4.06E-02	-9.63E-03	1.64E-02	2.69E-02
Eu-152	-1.11E-01	8.86E-02	1.30E-01	3.91E-02	8.41E-02	1.26E-01	2.48E-02	6.34E-02	9.09E-02
Eu-154	7.63E-03	6.10E-02	1.05E-01	6.01E-02	5.83E-02	1.05E-01	1.00E-02	4.42E-02	7.56E-02
Tl-208	2.17E-01	4.96E-02	4.09E-02	1.55E-01	4.30E-02	4.41E-02	1.78E-01	3.77E-02	5.79E-02
Bi-212	6.92E-01	5.08E-01	5.60E-01	3.24E-01	3.56E-01	6.76E-01	6.78E-01	3.74E-01	3.82E-01
Pb-212	6.78E-01	1.09E-01	1.70E-01	4.37E-01	1.02E-01	1.05E-01	6.60E-01	8.38E-02	5.74E-02
Bi-214	1.00E+00	1.23E-01	6.87E-02	1.10E+00	1.25E-01	7.14E-02	1.03E+00	9.79E-02	4.95E-02
Pb-214	1.09E+00	1.29E-01	8.47E-02	1.13E+00	1.26E-01	8.55E-02	1.13E+00	1.06E-01	6.40E-02
Ac-228	7.79E-01	2.10E-01	3.16E-01	5.65E-01	1.82E-01	2.82E-01	5.95E-01	9.68E-02	1.05E-01
Th-234	1.82E+00	3.92E+00	1.51E+00	-1.03E+00	3.59E+00	1.44E+00	8.03E-01	2.59E+00	1.01E+00
U-235	1.37E-01	2.31E-01	8.96E-02	1.64E-01	2.31E-01	9.00E-02	5.05E-02	1.60E-01	6.02E-02
Am-241	2.18E-01	6.67E-01	1.19E+00	-3.84E-01	6.51E-01	1.11E+00	-2.63E-01	4.74E-01	8.03E-01

Analytical Parameter	RL04-1246-0324		
	Result (pCi/g)	2 σ (pCi/g)	MDA (pCi/g)
Be-7	-8.89E-02	1.25E-01	2.06E-01
K-40	1.22E+01	1.43E+00	2.43E-01
Co-58	-3.78E-03	1.40E-02	2.47E-02
Co-60	1.87E-02	1.51E-02	2.90E-02
Zn-65	-3.28E-03	3.90E-02	5.91E-02
Sb-125	8.78E-03	4.42E-02	7.83E-02
I-131	-2.27E-02	2.46E-02	4.06E-02
Cs-134	-9.82E-03	1.74E-02	2.44E-02
Cs-137	-1.46E-03	1.65E-02	2.84E-02
Eu-152	4.63E-02	6.36E-02	8.70E-02
Eu-154	7.29E-04	4.45E-02	7.56E-02
Tl-208	1.80E-01	3.91E-02	2.87E-02
Bi-212	3.32E-01	3.52E-01	3.72E-01
Pb-212	5.85E-01	8.04E-02	5.66E-02
Bi-214	1.05E+00	1.02E-01	5.42E-02
Pb-214	1.09E+00	1.05E-01	6.16E-02
Ac-228	6.67E-01	1.01E-01	9.23E-02
Th-234	2.10E+00	2.73E+00	1.06E+00
U-235	-2.77E-02	1.59E-01	6.20E-02
Am-241	-2.99E-01	4.67E-01	7.88E-01

Table 14

EXCAVATION OVERBURDEN "A" COMPARISON VALUE CALCULATION

Area/Volume ID		Number of Data Points	t95% (n-1) Value from Table B-1 of NUREG/CR-5849
MH-7 to MH-A Trench	Overburden A	10	1.833

	Sample Number	Cs-137 Result (pCi/g)
1	305	0.11
2	306	0.20
3	307	0.12
4	308	0.04
5	309	0.05
6	310	0.06
7	311	0.05
8	312	0.04
9	313	0.07
10	314	0.06

Average	Comparison Value
0.08	0.11
Standard Deviation	**Modified Cleanup Criteria**
0.05	11
	Comparison < Criteria
	Yes

Table 15

EXCAVATION OVERBURDEN "B" COMPARISON VALUE CALCULATION

Area/Volume ID		Number of Data Points	t95% (n-1) Value from Table B-1 of NUREG/CR-5849
MH-7 to MH-A Trench	Overburden B	10	1.833

	Sample Number	Cs-137 Result (pCi/g)
1	315	0.06
2	316	0.59
3	317	0.15
4	318	0.37
5	319	0.05
6	320	0.04
7	321	0.04
8	322	0.04
9	323	0.03
10	324	0.03

Average	Comparison Value
0.14	0.25
Standard Deviation	**Modified Cleanup Criteria**
0.19	11
	Comparison < Criteria
	Yes